



# Circular Chart Recorder/ Controllers CTC1900 Series



Model CTC1900  
**\$1530**  
Basic Unit

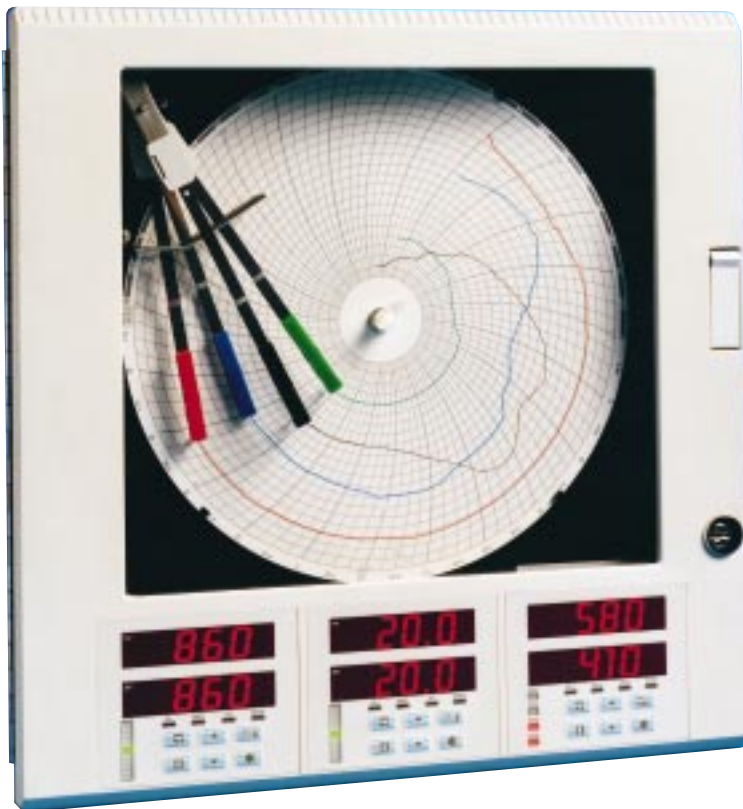
- ✓ 254 mm (10") Chart
- ✓ 1 to 4 Pens
- ✓ 1 or 2 Controllers
- ✓ Thermocouple, RTD, Voltage and Current Inputs
- ✓ NEMA-4X/IP66 Construction
- ✓ Multiple 6-Digit Indicator Panels
- ✓ 0.1% Accuracy
- ✓ PID Autotune on Demand
- ✓ Totalizers and Math Functions Built In
- ✓ RS-485 Modbus Serial Communications
- ✓ 20 Programmable Ramp/Soak Profiles

The CTC1900 provides full PID control of one or two process loops in addition to its powerful recording facilities. The control loops can operate independently or be soft-linked together to implement Cascade or Master/Slave control strategies. Each loop has a dedicated ¼ DIN-style operator panel for ease of operation and clarity of display.

The control output is selectable to fit any application with a choice of analog, time proportioning or valve positioning relays; use of a feedback potentiometer to ensure precise valve control is fully supported. Heating/cooling operation is available on both loops.

Operation of the autotune function on either loop instigates a tuning routine which allows the CTC1900 to calculate the optimum PID parameters for that particular loop. Following the completion of autotune, the PID values are automatically updated.

Dedicated membrane keys on each operator panel enable one-touch operation for selection between manual and automatic loop control and for switching from local to remote set point.



## Specifications Recording

Traces: Up to 4  
Colors: Red, green, blue, black  
Chart: 254 mm (10") circular  
Chart Speed: 1 to 167 hours or 7 to 32 days per revolution  
Trace Response: 7 sec full scale  
Trace Resolution: 0.1% steps

## Operation

**Display:**  
Number: Dual display for process value and setpoint for each controller, plus individual display for each record-only channel  
Type: 6-digit red LED, 0.56" (14 mm) high Status Indicators: Indicate channel number on display (on record-only chan.) Indicate remote setpoint, autotune or manual operation  
Alarm Indicators: Indicate channels with active alarms  
**Panel Keys:**  
Function: Programming access, increment/decrement, auto/manual, pen lift and user-defined function key

## Advanced Processing Functions

**Totalizers:**  
Number: 1 per pen  
Size: 99,999,999 max.  
Output: External counter driver "wrap pulse" signal  
**Math:**  
Number of equations: 4  
Type: +, -, x, ÷, low & high select, max, min, average, mass flow, RH  
**Timers:**  
Number: 2

Type: Real-time clock driven event, adjustable duration  
Output: Relay, digital output, logic equation

## Alarms and Logic

**Alarms:**  
Number: 4 per channel  
Type: High/low process, fast/slow rate of change, deviation high/low, output high/low  
Adjustment: Hysteresis, time delay  
**Logic Equations:**  
Number: 8  
Function: OR, AND  
Inputs: Alarm states, digital inputs, totalizers, logic  
Outputs: Relays, digital outputs, chart stop, alarm knowledge

## Analog Inputs

Number: 1, 2, 3 or 4  
**Input Sampling Rate:** 250 ms per channel  
Type: Universally configurable to provide: Thermocouple (TC), Resistance thermometer (RTD), Millivolt, Current, dc Voltage, Resistance

**Linearizer Functions:** Programmable for all input including:  $\sqrt{\quad}$ ,  $x^{3/2}$ ,  $x^{5/2}$ , T/C types B, E, J, K, R, S, T, L, N or Pt100

**Isolation:** 500 Vdc channel/channel  
**Digital Filter:** 0 to 60 s programmable

**Broken Sensor Detection:** Programmable UP/DOWN scale, RTD short/open circuit detection

**Cold Junction Compensation:** Automatic CJC incorporated as standard  
**Transmitter Power Supply:** 25 mA max. 1 per channel, fitted as standard, 24 Vdc  
**Isolation:** 500 Vdc channel/channel

## Analog Outputs

Type: 4 to 20 mA  
Accuracy:  $\pm 0.1\%$

## Analog Inputs

**Maximum Load:** 750 Ω  
**Isolation:** 500 Vdc

**Relay Outputs**  
**Type:** SPDT

**Rating (with non-inductive load):**  
 5 A at 115/230 Vac

**Digital Inputs**

**Type:** TTL or volt-free

**Minimum Pulse:** 250 ms

**Isolation:** 500 Vdc between modules,  
 no isolation within module

**Digital Outputs**

**Type:** 5 V TTL

**Rating:** 5 mA per output

**Isolation:** 500 Vdc between modules,  
 no isolation within module

**PID Control**

**Number of Loops:** 1 or 2

**Control Outputs:**

Relay, logic or dc analog

**Control Types:** Time proportioning,  
 analog

**Control Action:** PID, on/off, motorized  
 valve position, boundless

**Autotune:**

On demand, at start-up or at set point

**Option Modules**

**Number:** 5

**Connection:** Plug in cards with  
 detachable connection blocks

**Event Pens**

**Standard:** 3-position event recording on  
 any channel

**Real Time (optional):**

3-position event recording on the same time  
 line as pen 1

**Physical**

**Size:** 382 W x 386 H x 142 mm D  
 (15.04 x 15.23 x 5.57")

**Weight:** 8.2 kg (18 lb) approx.

**Panel Cut-Out:**

355.6 W x 285.75 mm H (14.0 x 11.25")

**Case Material:**

Glass-filled polyester polycarbonate

**Window Material:** Polycarbonate

**Environmental**

**Operational Temperature Range:**

0 to 55°C (32 to 130°F)

**Operational Humidity Range:**

5 to 95% RH (non-condensing)

5 to 80% RH (chart only)

**Case Sealing:** NEMA-4X (IP66)

**Noise Rejection:**

Common mode >120 db at 50/60 Hz

Normal (series) mode >60 db at 50/60 Hz

**CJC Rejection Ratio:** <0.05°C/°C

**Sensor Break Protection:**

Upscale or downscale drive

**Out of Range Detection:**

0 to 100% of engineering span

**Temperature Stability:**

<0.02% of reading/°C or 1 μV/°C

Long-Term Drift: <0.01% of reading

10 μV annually

**Input Impedance:** >10 MΩ

(mV and V inputs) 100 Ω (mA input)

**Electrical**

**Power Supply:** 85 to 265 Vac 50/60 Hz  
 line frequency or 24 ± 4 Vdc (optional)

**Power Consumption:** 40 VA max;

**General Safety:** IEC 348

**Approvals:**

CE, CSA, Class 1 Div 2 (optional)

**Electrical Connections:** Screw terminals

**Memory Protection:**

Nonvolatile EEPROM

**Serial Communication Module:**

RS-485 (4-wire) protocol programmable

1200 to 9600 baud. MODBUS rtu (slave)

protocol. Instrumentation protocol

Input Type	Min. Value	Max. Value	Min. Span	Accuracy (% of reading)
Millivolts	0	150	5	±0.1% or ±10 μV
Volts	0	5	.1	±0.1% or ±20 μV
Milliamps	0	50	1	±0.2% or ±0.2 μA
Resistance low	0	750	20	±0.2% or ±0.1 Ω
Resistance high	0	10 k	400	±0.5% or 10 Ω

## Thermocouple Inputs

Input Type	°C			°F		
	Range	Min. Span	Accuracy	Range	Min. Span	Accuracy
B	-18 to 1800	710	±2.0*	0 to 3270	1278	±3.6*
E	-100 to 900	45	±0.5	-148 to 1652	81	±0.9
J	-100 to 900	50	±0.5	-148 to 1652	90	±0.9
K	-100 to 1300	65	±0.5	-148 to 2372	117	±0.9
L	-100 to 900	50	±0.5	-148 to 1652	90	±0.9
N	-200 to 1300	90	±0.5	-328 to 2372	162	±0.9
R&S	-18 to 1700	320	±1.0*	0 to 3092	576	±1.8*
T	-250 to 300	60	±0.5	-418 to 572	108	±0.9
RTD	-200 to 600	25	±0.5†	-328 to 1112	45	±0.9†

Min. span below zero: Type T: 70°C/126°F, Type N: 105°C/189°F, TC standards: DIN 43710/IEC 584

\*Performance accuracy is not guaranteed below 300°C (572°F) for types B, R and S thermocouples.

†RTD, 3-wire platinum, 100 Ω per DIN 43760 standard (IEC751), with temperature over 300°C (575°F) accuracy is ±1.0°C (±1.8°F)

## To Order (Specify Model Number)

Model Number	Price	Description
CTC1911	\$1530	1-pen recorder with 1 controller
CTC1912	1910	2-pen recorder with 1 controller
CTC1913	2295	3-pen recorder with 1 controller
CTC1914	2650	4-pen recorder with 1 controller
CTC1922	2100	2-pen recorder with 2 controller
CTC1923	2525	3-pen recorder with 2 controller
CTC1924	2830	4-pen recorder with 2 controller

All units include the following for each pen: 2 digital inputs, relay output, control or retransmission output, transmitter power supply, and isolated input. Recorder comes complete with package of paper, one pen per channel and operator's manual. **Ordering Example:** CTC1912-4R, 2-pen recorder with 1 controller and optional 4 relay outputs \$1910 + 245 = \$2155. OMEGACARE<sup>SM</sup> extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. **OCW-1 OMEGACARE<sup>SM</sup>** extends standard 2-year warranty to a total of 3 years (\$150), \$2155 + 150 = \$2305

## Options

Ordering Suffix	Price	Description
-4R	\$245	4 relay outputs (max 2)
-24V	110	24 Vdc power option
-RS485	275	RS-485 communications
-C1D2	50	Class 1, division 2, rated
-8DI	245	8 digital (logic) inputs
-8DO	245	8 digital (logic) outputs
-TOTAL	250	Totalization for up to 4 channels
-MT	250	Math functions and timer
-TMT	400	Totalization, math and timer combo
-TTEV	110	True time event pen
-RAMP	250	Ramp/soak programmable profiles

## Accessories

Model Number	Price	Description
CT-1900-RED	\$17	5 red pens channel 1
CT-1900-GREEN	17	5 green pens channel 2
CT-1900-BLUE	17	5 blue pens channel 3
CT-1900-BLACK	17	5 black pens channel 4
CT-1000C-100/7*	140	500 charts, 0-100 range, 7-day
CN34-SW	150	Configuration software

\*Other chart ranges available; consult Sales



#### UNITED STATES

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
Stamford, CT.

#### CANADA

[www.omega.ca](http://www.omega.ca)  
Laval(Quebec)  
1-800-TC-OMEGA

#### GERMANY

[www.omega.de](http://www.omega.de)  
Deckenpfronn, Germany  
0800-8266342

#### UNITED KINGDOM

[www.omega.co.uk](http://www.omega.co.uk)  
Manchester, England  
0800-488-488

#### FRANCE

[www.omega.fr](http://www.omega.fr)  
Guyancourt, France  
088-466-342

#### CZECH REPUBLIC

[www.omegaeng.cz](http://www.omegaeng.cz)  
Karviná, Czech Republic  
596-311-899

#### BENELUX

[www.omega.nl](http://www.omega.nl)  
Amstelveen, NL  
0800-099-33-44



## More than 100,000 Products Available!

### • Temperature

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

### • Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters