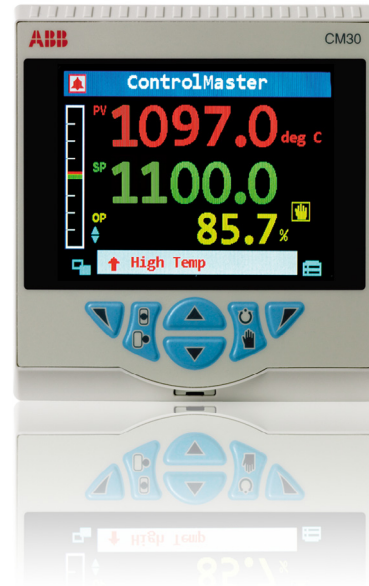


ControlMaster CM30

Universal process controller, 1/4 DIN

Making process control easy



Comprehensive display of process status

- Crystal-clear, full-color TFT display
- User-customizable
- Historical trending

Exceptionally easy to use

- Intuitive user interface and clear text prompts make installation, commissioning and operation quick and simple

Scalable to match application requirements

- Comprehensive hardware and software options

Powerful control functionality

- Cascade, feed-forward, ratio, predictive and adaptive control strategies
- Dual-loop capability

Problem-solving capability

- Flexible functionality including math, logic and totalization providing power to solve complex application requirements

Built to survive

- IP 66 and NEMA 4X environmental protection

Flexible connectivity

- Ethernet and MODBUS® communications

Technical specification

Operation

Display

Color, 1/4 VGA TFT, liquid crystal display (LCD) with built-in backlight

Language

English, German, French, Italian and Spanish

Operator keypad

6 tactile membrane keys

Trend display

- Recording of 2 variables
- Configurable sample rate (1 second to 5 minutes)
- 272 samples displayed on screen

Security

Password protection

Basic / Advanced – user-assigned password protection (not set at factory)

Standard functions

Control strategies

Base templates:

- Single loop with local setpoint
- Single loop with remote setpoint

Standard templates:

- Auto / Manual station (low signal detection)
- Auto / Manual station (digital signal selection)
- Analog backup station (low signal detection)
- Analog backup station (digital signal detection)
- Single indicator / manual loader station
- Dual indicator / manual loader station

Extended templates:

- Single loop with feedforward
- Single loop with feedforward and remote setpoint
- Cascade
- Cascade with remote setpoint
- Cascade with feedforward
- Ratio controller with internal ratio
- Ratio controller with external ratio
- Ratio station with internal ratio
- Ratio station with external ratio

Dual loop templates:

- Dual loop with local setpoints
- Dual loop with remote setpoint on 1 and local setpoint on 2
- Dual loop with remote setpoint on both

Control output types

Current proportioning

Time proportioning

On / Off

Motorized valve with feedback

Motorized valve without feedback

Split output – with combinations of relay, digital output and current outputs

Control parameters

Proportional band: *

- 0.0 to 999.9 s

Integral: *

- 0 to 10000 s

Derivative: *

- 0.0 to 999.9 s

Manual Reset:

- 0.0 to 100.0 %

* 3 sets of PID parameters when used with Gain Scheduling facility

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Setpoints

Local:

- 4, selectable via digital input or front panel

Remote:

- selectable via digital input or front panel keys

Auto tune

On-demand calculation of control settings

Process alarms

Number:

- 8

Types:

- High / Low process
- High / Low latch

Source

- Fully configurable
(for example – PV, Analog input, Math block inbuilt, OP control loop deviation)

Hysteresis:

- Level and time

Alarm enable:

- Enable / Disable individual alarms via a digital signal

Acknowledgement

Via front panel keys or digital signals

Real-time alarms

Number:

- 2

Programmable:

- Time
- Day
- Duration

Totalizer

Number:

- 2 (freely assignable) 9 digit total

Type:

- Analog, digital, frequency or pulse

Statistical calculations:

- Average, maximum, minimum (for analog signals)

Update rate:

- 125 ms

Math blocks

Number:

- 8

Operators:

- +, –, x, /
- Average, Maximum, Minimum
- High / Low / Median select
- Square root
- Multiplexer

Delay timers

Number:

- 2

Programmable:

- Delay
- Duration

Logic equations

Number:

- 8

Elements:

- 15 per equation

Operators:

- OR, AND, NOR, NAND, NOT, EXOR

Custom linearizer

Number:

- 2

Elements:

- 20 breakpoints

Analog inputs

Universal process inputs

Number:

- 2 (1 standard, 1 optional)

Type:

- Voltage
- Current
- Resistance (ohms)
- 3-Wire RTD
- Thermocouple
- Digital volt-free
- Digital 24 V
- Frequency (Input 1)
- Pulse

Non-universal process inputs

Number:

- 2 (1 standard, 1 optional)

Type:

- Voltage
- Current
- Thermocouple *
- Digital volt-free
- Digital 24 V

Thermocouple types

B, E, J, K, L, N, R, S, T

Resistance thermometer

Pt100

Other linearizations

\sqrt{x} , $x^{3/2}$, $x^{5/2}$, custom linearization

Digital filter

Programmable 0 to 60 s

Display range

–9999 to 99999

Update rate

125 ms

Common mode noise rejection

> 120 dB at 50 / 60 Hz with 300 Ω imbalance resistance

Normal (series) mode noise rejection

> 60 dB at 50 / 60 Hz

CJC rejection ratio

0.05 $^{\circ}\text{C}/^{\circ}\text{C}$ change in ambient temperature

Temperature stability

0.02 $\%/^{\circ}\text{C}$ or 2 $\mu\text{V}/^{\circ}\text{C}$ (1 $\mu\text{V}/^{\circ}\text{F}$)

Long term (input) drift

< 0.1 % of reading or 10 μV annually

Input impedance

> 10 $\text{M}\Omega$ (mV input)

10 Ω (mA input)

* Only if universal process input is configured as 'Thermocouple'

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Inputs

Thermocouple	Maximum range °C (°F)	Accuracy (% of reading)
B	-18 to 1800 (0 to 3270)	0.1 % or ±2 °C (3.6 °F) (above 200 °C [392 °F]) *
E	-100 to 900 (-140 to 1650)	0.1 % or ±0.5 °C (0.9 °F)
J	-100 to 900 (-140 to 1650)	0.1 % or ±0.5 °C (0.9 °F)
K	-100 to 1300 (-140 to 2350)	0.1 % or ±0.5 °C (0.9 °F)
L	-100 to 900 (-140 to 1650)	0.1 % or ±1.5 °C (2.7 °F)
N	-200 to 1300 (-325 to 2350)	0.1 % or ±0.5 °C (0.9 °F)
R	-18 to 1700 (0 to 3000)	0.1 % or ±1 °C (1.8 °F) (above 300 °C [540 °F]) *
S	-18 to 1700 (0 to 3000)	0.1 % or ±1 °C (1.8 °F) (above 200 °C [392 °F]) *
T	-250 to 300 (-400 to 550)	0.1 % or ±0.5 °C (0.9 °F) (above -150 °C [-238 °F]) *

* Accuracy is not guaranteed at temperatures below this value

RTD	Maximum range °C (°F)	Accuracy (% of reading)
Pt100	-200 to 600 (-325 to 1100)	0.1 % or ±0.5 °C (0.9 °F)

Linear inputs	Standard analog input	Accuracy (% of reading)
Millivolts	0 to 150 mV	0.1 % or ±20 µV
Milliamps	0 to 50 mA	0.2 % or ±4 µA
Volts	0 to 25 V	0.2 % or ±20 mV
Resistance (low)	0 to 550 Ω	0.2 % or ±0.1 Ω
Resistance (high)	0 to 10 kΩ	0.5 % or ±10 Ω
Sample Interval	125 ms per sample	

Digital inputs	
Type	Volt-free or 24 V
Minimum pulse duration	Analog inputs 1 and 2: – Single inputs configured – 250 mS – Both inputs configured as analog or digital – 500 mS Analog inputs 3 and 4: – Single inputs configured – 250 mS – Both inputs configured as analog or digital – 500 mS Consider analog inputs 1/2 and 3/4 independently

Frequency input*	
Frequency range	0 to 6000 Hz
1-signal	15 to 30 V
0-signal	-3 to 5 V

*For use with devices with open collector outputs

Outputs

Controls / Retransmission outputs

Number:

- 2 (1 standard, 1 optional)

Type:

- Configurable as analog or digital pulse

Isolation:

- Galvanically isolated from the rest of the circuitry,
500 V for 1 minute

Analog range:

- 0 to 20 mA programmable

Load:

- 750 Ω max.

Accuracy:

- 0.2 % of output or ±10 µA

Relays

Number:

- 4 (1 standard, 3 optional)

Type:

- Standard with changeover contacts
- Optional contacts selectable as NO or NC (by jumper)

Contact ratings:

- 5 A, 240 V

Update rate:

- 125 ms

Digital I/O

Number:

- 6 (2 standard, 4 optional)

Type:

- User-programmable as input or output
- Minimum input pulse duration – 125 ms

Input:

- Volt-free or 24 V DC
- 1-signal 15 to 30 V
- 0-signal –3 to 5 V
- Conforms to IEC 61131-2

Output:

- Open collector output
- 30 V, 100 mA max. switched
- Conforms to IEC 61131-2

Update rate:

- 125 ms

2-Wire transmitter power supply

Number:

- 2 (1 standard, 1 optional)

Voltage:

- 24 V DC

Drive:

- 2 Loops for each transmitter PSU,
45 mA max.

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Communications

Note. Only one communications option can be fitted per controller.

IrDA service port (standard)

Baud rate:

- Up to 115 kBaud

Distance:

- Up to 1 m (3 ft)

Functions:

- Firmware upgrade
- Configuration upload / download

Ethernet (optional)

Type:

- 10BaseT

Connector:

- RJ 45

Protocols:

- TCP/IP
- HTTP
- MODBUS TCP (Slave)

Web server:

- Built-in – enables remote monitoring using standard web browsers

Email

- Can be configured to be sent on the occurrence of a specified event
- Up to 3 recipients
- Up to 4 trigger sources with configurable tag

MODBUS * RTU (optional)

Baud rate:

- Up to 115 kBaud

Isolation:

- Galvanically isolated from the rest of the circuitry, 500 V DC for 1 minute

* MODBUS is a registered trademark of the MODBUS-IDA organization

EMC

Emissions & immunity

Meets requirements of IEC 61326 for an Industrial Environment

Environmental

Operating temperature range

-0 to 55 °C (32 to 131 °F)

Operating humidity range

5 to 95 % RH (non-condensing)

Storage temperature range

-20 to 70 °C (-4 to 158 °F)

Enclosure sealing

Front face:

— IP 66 & NEMA 4X

Rest of enclosure:

— IP 20

Vibration

Conforms to EN60068-2-6

Safety

Approvals and certifications

EN 61010-1

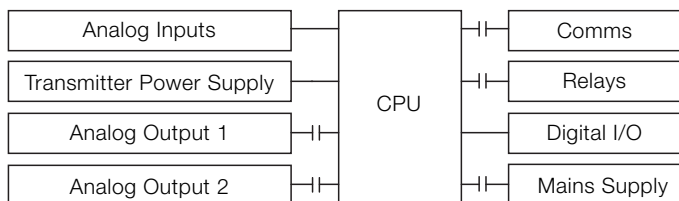
cULus

General safety

Pollution category 2

Insulation category 2

Isolation



Key

—||— = Isolation

Electrical

Supply ranges

100 V to 240 V AC $\pm 10\%$ (90 V min. to 264 V max.) 50 / 60 Hz
10 to 36 V DC (optional)

Power consumption

10 W max.

Power interruption protection

No effect for interrupts of up to 60 ms

Physical

Size

97 x 97 x 141 mm (3.8 x 3.8 x 5.5 in.)

Weight

0.5 kg (1.1 lb) approx. (unpacked)

Panel cutout

92 x 92 mm (3.6 x 3.6 in.), 121 mm (4.8 in.) behind panel

Case material

Glass-filled polycarbonate