Data sheet DS/C160–EN Rev. I

C160
Wall-/Pipe Mounted Universal Process Indicator

C160 – reliable process indicator, wherever it's needed

High visibility LED display
— the clearest view of your process status

0.1% measurement accuracy
— precise indication of process measurement

IP66/NEMA4X wall-/pipe-mounted weatherproof enclosure
— reliability in the harshest environments

Analog and relay outputs as standard
— alarm and retransmission facilities built-in

Totalizer and math functions
— 6-digit totals and max./min. values

Universal process input with transmitter power supply
— direct connection for any process signal

RS485/Modbus serial communications
— SCADA, PLC and open system integration

Power and productivity
for a better world™

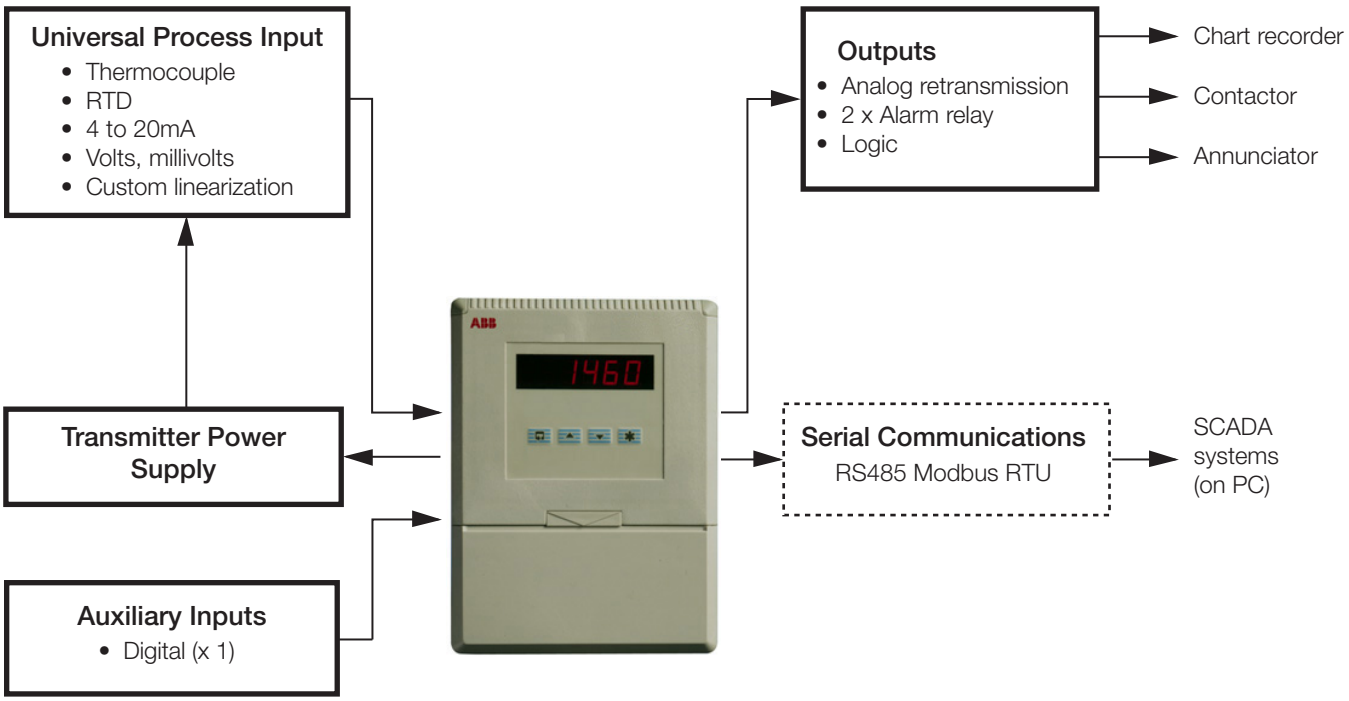
C160

The C160 Universal Wall-mounting Indicator is a highly versatile, 5-digit industrial display indicator, with the capability to measure and indicate temperature, pressure, flow, level and other process variables.

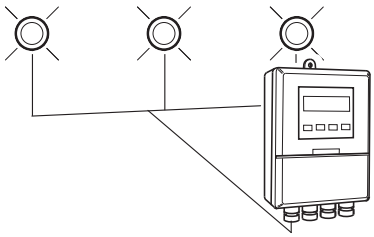
The standard C160 provides a retransmission output and two alarm relays, with the option to add RS485 communications to suit your application.

With all-round IP66/NEMA4X protection as standard, and superior RF immunity, the C160 has been designed to provide reliable indication in the harshest environments.

Pipe-mounted C160 Indicator

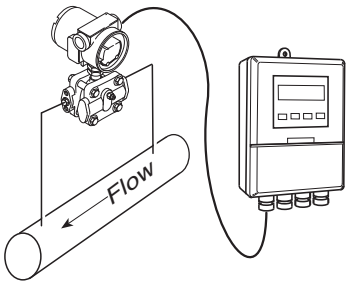


KEY: Standard Option



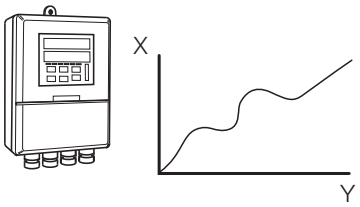
Display and Alarm

The C160's two built-in 5A relays can be used to annunciate high or low process alarms. Active alarms are indicated by flashing LEDs to the right of the main display.



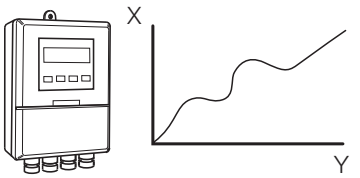
Isolated Retransmission

The C160 has, as standard, a 4 to 20mA output for retransmission of the process variable to a chart recorder or data logger.



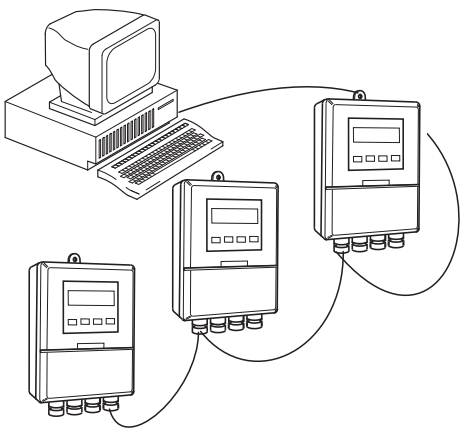
Custom Linearization

As standard the C160 has a 20-breakpoint linearizer suitable for volume calculation. (Factory setup using PC configurator).



Flow Totalization, 6 digits

A standard feature in the C160 is flow totalization. This totals any 4 to 20mA flow signal. With the built-in transmitter power supply and root extraction this makes the C160 ideal for use with Differential Pressure devices such as the WEDGEMASTER. It can also be configured for simple batch control by use of preset and predetermined totals.



RS485/Modbus

Fitted with an optional RS485 serial communication board the C160 can communicate with PLCs and SCADA systems using the Modbus protocol.

Specification

Summary

Fully user-configurable universal indicator

IP66/NEMA4X all-round protection

Large 5-digit display

Totalizer/math functions as standard

Operation

Display

High-intensity 7-segment, 1 x 6-digit LED display

Three alarm LED indicators

Display range	process value	–9999 to +99999
	totalization	0 to 999999
Display resolution		±1 digit
Display height		14mm (0.56 in.)

Configuration

User-defined via front panel or PC configurator

Standard Functions

Totalizer

Six-digit, batch and secure totals

Alarms

Number	Three user-defined
Types	High/Low process
	High/Low latch
	Fast/Slow rate

Maths function

Maximum and minimum value detection

Average value calculation

Analog Input

Input sampling rate

250ms

Type

Universally configurable to provide:

- Thermocouple (THC)
- Resistance Thermometer (RTD)
- Millivolt
- Current
- DC Voltage

Input impedance

mA	100Ω
mV, V	>10MΩ

Linearizer functions

Programmable for:

Square root, THC types B, E, J, K, N, R, S, T or Pt100

Custom 20-breakpoint linearizer, set up by PC configurator

Broken sensor protection

Upscale drive on thermocouple and RTD

Downscale drive on milliamps and voltage

Cold junction compensation

Automatic CJC incorporated as standard

Stability <0.05°C/°C change in ambient temperature

Input protection

Common mode isolation	>120dB at 50/60Hz with 300Ω imbalance resistance
Series mode rejection	>60dB at 50/60Hz

Transmitter power supply

24V, 30mA max. to power one 2-wire transmitter

Inputs/Outputs

Retransmission

Analog, configurable in the range of 4 to 20mA

Max. load	15V (750Ω at 20mA)
Accuracy	≤ 0.25% of span
Isolation	500V DC from input (not isolated from logic output)

Assignable to Process Variable or Average PV

Logic output

Rating	18V DC at 20mA
Min. load	400Ω
Isolation	500V from input (not isolated from retransmission output)

Relay output

Number	2 standard (+ 1 optional)
Rating	(SPDT) 5A at 115/230V AC, 5A at 24V DC
Function wrap	Alarms, totalizer count pulse, totalizer pulse or end of batch alarm.

Digital input

Type	Volt-free
Minimum pulse	250ms

Options

Modbus serial communications

Connections	RS422/RS485, 2 or 4-wire
Speed	2.4k or 9.6k baud rate
Protocol	Modbus RTU slave

Physical

Size

160mm (6.3 in.) wide x 250mm (9.84 in.) high x 68mm (2.68 in.) deep

Weight

2kg (4.5 lb) approx.

Mounting Option

Wall-mounted

Pipe-mounted with optional kit Pt. No. 4600/0138

Electrical

Voltage

85 to 265V AC 50/60Hz

24V DC (option)

Power consumption

<6VA AC

<5W DC

Power interruption protection

<60ms/< 3 cycles, no effect

>60ms/>3 cycles, instrument returns to operation after a controlled reset

Environmental

Operating limits

–10 to 55°C (32 to 131°F)

5 to 95% RH non-condensing

Temperature stability

<0.02% of reading or 2µV/°C (1µV/°F)

Enclosure

IP66/NEMA4X

EMC

Emissions and Immunity

Meets requirements of IEC 61326 for an Industrial Environment

Design and manufacturing standards

CE mark

Electrical safety

EN61010 – 1

Standard Analog Input Ranges

Thermocouple	Maximum Range °C	Maximum Range °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)
G	–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 ±1.0°C (1.8°F) [above 300°C (572°F)] *
S	–18 to 1700	0 to 3000	0.1% or ±0.5°C (0.9°F) [above 200°C (392°F)] *
T	–250 to 300	–400 to 550	0.1% or ±0.5°C (0.9°F)

* For B, R and S thermocouples, performance accuracy is not guaranteed below value stated

Min. span below zero Type T 70ºC (126ºF)
Type N 105ºC (189ºF)

THC standards DIN 43710
IEC 584

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

** RTD, 3-wire platinum, 100Ω per DIN 43760 standard (IEC 751), with range of 0 to 400Ω

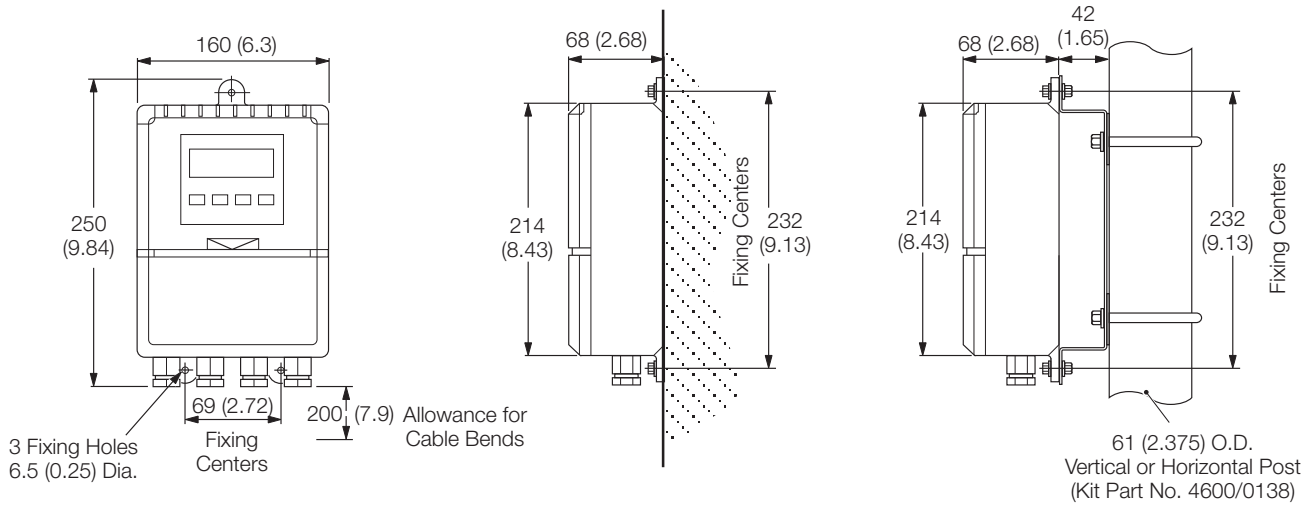
Linear Inputs	Range	Accuracy (% of reading)
Milliamps	0 to 20mA	0.2% or ±2µA
Milliamps	4 to 20mA	0.2% or ±2µA
Volts	0 to 5V	0.2% or ±200µV
Volts	1 to 5V	0.2% or ±200µV
Millivolts	0 to 50mV	0.1% or ±20µV

Square Root Input	Range	Accuracy (% of reading)***
Milliamps	4 to 20mA	0.2% or ±2µA

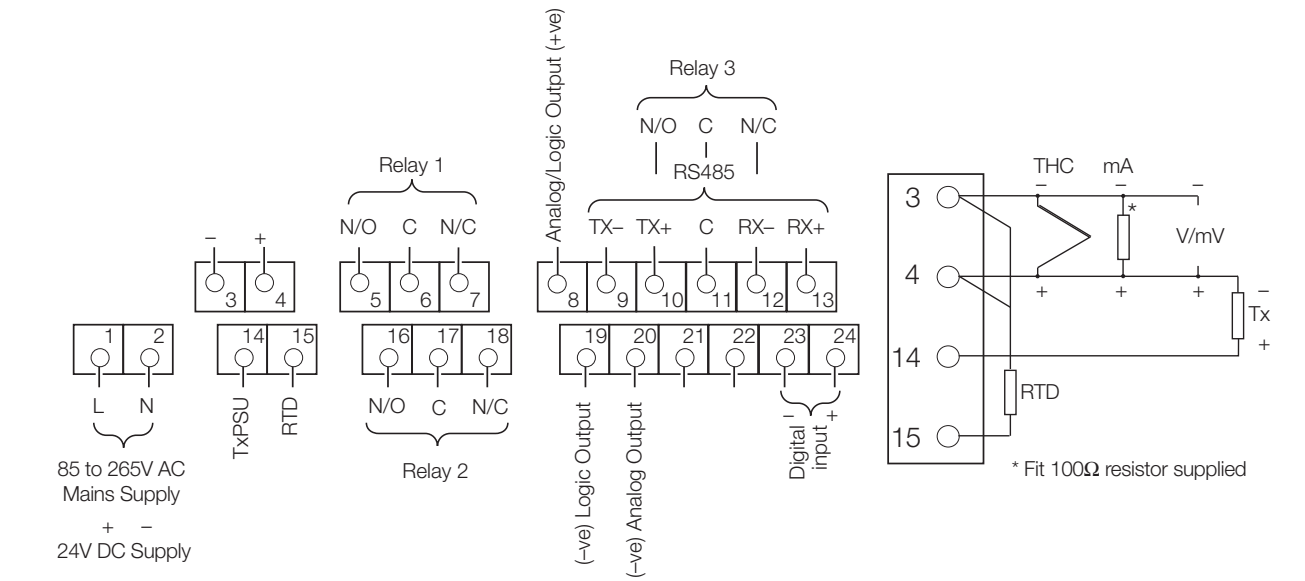
*** Below input of 4.64mA (20% flow) the input is linear

Overall Dimensions

Dimensions in mm (in.)



Electrical Connections



Ordering Information

C160 Wall-/Pipe Mounted Universal Process Indicator	C160	/ X	X	X	X	/	X	X	X	X
Relay Option										
2 relays + 1 digital input + 4 to 20mA retransmission + logic output		0	1							
3 relays + 1 digital input + 4 to 20mA retransmission + logic output		0	2							
Modbus Option										
2 relays + 1 digital input + 4 to 20mA retransmission + logic output + RS485 Modbus		0	3							
Power Supply										
85V to 265V AC (M20 fitted with cable glands)				0						
24V DC (M20 fitted with cable glands)				1						
85V to 265V AC (NPT fitted with blanking plugs)				2						
24V DC (NPT fitted with blanking plugs)				3						
Build										
ABB Standard					0					
Programming/Special Features										
Configured to factory standard							S	T	D	
Configured to customer requirements							C	U	S	
Special features							S	P	X	X

Contact us

ABB Limited
Process Automation
Howard Road
St. Neots
Cambridgeshire PE19 8EU
UK
Tel: +44 (0)1480 475321
Fax: +44 (0)1480 217948

ABB Inc.
Process Automation
125 E. County Line Road
Warminster
PA 18974
USA
Tel: +1 215 674 6000
Fax: +1 215 674 7183

www.abb.com

3KXJ301102R1001

Modbus™ is a trademark of Modicon, Inc.

DS/C160–EN Rev. I 01.2011

Power and productivity
for a better world™