C1901
Single pen circular chart recorder
Measurement made easy
C1901 – a rugged, reliable recorder for all single channel recording applications

Universal process input
• mA, mV, V, thermocouples and resistance

Signal linearization
• full range of linearizers included as standard

6-digit indicator panel
• continuous display of process value

NEMA 4X/IP66 construction
• hosedown protection

Optional totalizer function
• 8-digit flow totalizer
C1901

The C1901 is a single pen, fully programmable circular chart recorder. The instrument’s straightforward operator controls and robust construction make it suitable for a variety of industrial environments.

Designed to survive

NEMA 4X protection ensures the C1901 can survive in the harshest environments and makes the recorder ideal for use in panels which are regularly hosed down. The tough, acid-resistant case and secure cable-entry glands maintain the NEMA 4X rating for wall-mount or pipe-mount instruments.

Easy to install

A choice of mounting options enables simple installation of the recorder in a panel, on a wall or on a pipe. Mains isolation can be provided by an optional power switch within the instrument.
Specification

Construction
Size (h x w x d)  
386.0 x 382.0 x 141.5 mm (15.23 x 15.04 x 5.57 in.)
Weight  
8.2 kg (18 lb)
Case material  
Glassfiber-filled reinforced polyester
Window material  
Polycarbonate
Door latch  
High-compression with optional lock

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)
Fast transients  
IEC 801-4 Level 3

Installation
Mounting options  
Panel, wall or pipe
Terminal type  
Screw
Wire size (max.)  
14 AWG (I/O), 12 AWG (power)

Operation and configuration
Programming method  
Via front panel keys
Security  
Password-protected menus

Safety
General safety  
IEC348
Isolation  
2 kV DC (channel / ground)
Memory protection  
Nonvolatile FRAM

Approvals  
• CE (panel, wall or pipe)
• CSA (option)
• CSA/FM Class 1 Div. 2 (option)
• UL (option)

Power supply
Voltage  
100 to 240 V AC ±10 %
(90 V min. to 264 V max. AC), 50/60Hz
Consumption  
<30 VA
Line interruption  
Up to 60 ms

Totalizer
Size  
99,999,999 max.
Count direction  
Up or down
Preset  
User-programmable

Process input
Noise rejection  
Common mode: >120 dB at 50/60Hz
Normal (series) mode: >60 dB at 50/60Hz
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 inputs)

Analog input
Signal types  
mV, V, mA, Ω
Thermocouple types  
B, E, J, K, N, R, S, T
Resistance thermometer  
Pt100
Other linearizations  
x^{3/2}, x^{5/2}, square root
Sample interval  
250 ms
Digital filter  
0 to 60s programmable
Recording system

Pen color
Red

Pen response
7 seconds (full scale)

Pen resolution
0.1 % steps

Pen lift
Motor-driven, with optional auto-drop

Chart size
10 in. or 105 mm

Chart speed
7 seconds (full scale) 1 to 167 hours
or 7 to 32 days per revolution

Rotation accuracy
<0.5 % of rotation time

Display and operator panels

Display type
6-digit red LED, 14 mm (0.56 in.) high

Panel keys function
Programming access, increment / decrement, pen lift and user-defined function key.

EMC

Emissions and Immunity
Meets requirements of:
- EN 50081-2
- EN 50082-2
- IEC 61326 for an industrial environment
- CE Mark

Analog input performance

<table>
<thead>
<tr>
<th>Type</th>
<th>Range Lo</th>
<th>Range Hi</th>
<th>Min. span</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>mV</td>
<td>0</td>
<td>150</td>
<td>5</td>
<td>±0.1 % reading or 10 µV</td>
</tr>
<tr>
<td>V</td>
<td>0</td>
<td>5</td>
<td>0.1</td>
<td>±0.1 % reading or 20 mV</td>
</tr>
<tr>
<td>mA</td>
<td>0</td>
<td>50</td>
<td>1</td>
<td>±0.2 % reading or 0.2 µA</td>
</tr>
<tr>
<td>Ω (low)</td>
<td>0</td>
<td>750</td>
<td>20</td>
<td>±0.5 % reading or 10 Ω</td>
</tr>
<tr>
<td>Ω (high)</td>
<td>0</td>
<td>10 k</td>
<td>400</td>
<td>±0.5 % reading or 0.1 Ω</td>
</tr>
</tbody>
</table>

Temperature conversion:

<table>
<thead>
<tr>
<th>Type</th>
<th>°C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>–18</td>
<td>3.6</td>
</tr>
<tr>
<td>E</td>
<td>–100</td>
<td>3.6</td>
</tr>
<tr>
<td>J</td>
<td>–100</td>
<td>3.6</td>
</tr>
<tr>
<td>K</td>
<td>–100</td>
<td>3.6</td>
</tr>
<tr>
<td>N</td>
<td>–200</td>
<td>3.6</td>
</tr>
<tr>
<td>R</td>
<td>–18</td>
<td>1.8</td>
</tr>
<tr>
<td>S</td>
<td>–18</td>
<td>1.8</td>
</tr>
<tr>
<td>T</td>
<td>–250</td>
<td>1.8</td>
</tr>
<tr>
<td>PT100</td>
<td>–200</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Accuracy (excl. CJC):

- ±2 °C (above 200 °C)
- ±0.5 °C (±0.9 °F)
- ±1 °C (above 300 °C)
- ±0.5 °C (±0.9 °F)
Wiring connections

Voltage

3
6
+ -

Thermocouple

3
6
+ -

Low voltage (mV)

3
6
+ -

Current

3
4
+ -

3-wire RTD

4
5
+ -

Red
White
Red

2-wire RTD and resistance

4
5
+ -

Link
White
Red

Standard input connections

Power switch (optional)

Fuse (optional)

Earth (ground) stud

Line
Neutral

Power supply connections

Overall dimensions

Dimensions in mm (in.)
Ordering information

<table>
<thead>
<tr>
<th>C1901 single pen circular chart recorder</th>
<th>1901</th>
<th>X</th>
<th>X</th>
<th>0</th>
<th>X</th>
<th>X</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>XXX</th>
<th>OPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taylor (ER/C) charts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>J</td>
<td></td>
</tr>
<tr>
<td>KPC 105, Kent PX and Kent PXR type charts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>K</td>
<td></td>
</tr>
<tr>
<td>Chessell brand charts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Build</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABB standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>CSA approved</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>CSA/FM Class 1 Division 2 approved</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>UL approved</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>U</td>
<td></td>
</tr>
<tr>
<td>Options</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Totalizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Door lock</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not fitted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fitted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>115 V AC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>230 V AC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>115 V AC with on / off switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>230 V AC with on / off switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Programming / Special features</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configured to factory standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>STD</td>
<td></td>
</tr>
<tr>
<td>Configured to customer requirements (customer to complete and supply C1901 custom configuration sheet – INF08/031)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CUS</td>
<td></td>
</tr>
<tr>
<td>Special features</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SXX</td>
<td></td>
</tr>
<tr>
<td>Engineered configuration (customer to supply configuration details required)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ENG</td>
<td></td>
</tr>
<tr>
<td>Calibration certificate **</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C1</td>
</tr>
<tr>
<td>Printed instruction manual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M5</td>
</tr>
</tbody>
</table>

** When a calibration certificate is ordered it is performed according to the specified configuration type:
CUS/ENG – Inputs and outputs calibrated according to the customer supplied configuration details and ranges.
STD – Inputs and outputs calibrated according to the instrument factory standard configuration and ranges.

Accessories

ENG/REC After-sales engineered configuration service
ABB Limited
Measurement & Analytics
Howard Road, St. Neots
Cambridgeshire, PE19 8EU
UK
Tel: +44 (0)1480 475 321
Fax: +44 (0)1480 217 948
Mail: instrumentation@gb.abb.com

ABB Inc.
Measurement & Analytics
125 E. County Line Road
Warminster, PA 18974
USA
Tel: +1 215 674 6000
Fax: +1 215 674 7183

abb.com/recorders

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail.

ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB.

© Copyright 2019 ABB. All rights reserved.