

# Programmable Chart Recorders

## 100 and 180 mm

### RD101B Series



- ✓ Digital and Bar Graph Display
- ✓ 1, 2, 3, 4 Continuous Pens or 6-Point Dot Printing Models (RD1800B Also Has 12-, 18-, 24-Dot Printing)
- ✓ Universal Inputs: Thermocouple, RTD, Voltage
- ✓ Programmable Input Types, Full Scale Ranges, Alarms, Chart Speed
- ✓ Powerful but Easy to Use
- ✓ Interactive Displays Make Setup Easy
- ✓ Large, Bright Dot-Matrix Display for Data and Units
- ✓ Compact—Only 220 mm (8.6") Deep
- ✓ Splashproof Front Door
- ✓ Fast Dot Printing—6 Channels in as Little as 10 Seconds
- ✓ Removable Terminal Blocks for Easy Wiring
- ✓ Optional Alarms with Remote Control
- ✓ Optional RS422A/RS485 or Ethernet Communications
- ✓ Pen Offset Compensation

The RD100B 100 mm (4") and RD1800B 180 mm (7") Series programmable chart recorders are easy to use. They feature universal thermocouple, RTD, and DC voltage (mV or V) inputs, as well as an analog bar graph and a digital display.



RD106B with KTSS-18G-12 thermocouple, sold separately, shown smaller than actual size. See [omega.com](http://omega.com)

Each recorder can print out—at programmed intervals or on demand—the date and time, channel number, scale marking, tag number, proper engineering units, chart speed, alarm value, and complete program list.

The non-contact, ultrasonic pen-position transducer is more accurate than standard pen mechanisms. The wear-free, brushless DC servo-motor eliminates the need for motor brushes, lead wire, and connectors, and is directly mounted to the printed circuit board. These 2 features contribute to the long, trouble-free life of these recorders.

**Optional Communication Output**  
The optional RS422A/RS485 or Ethernet interface lets the

user connect up to 32 units on a multidrop line to a single host computer for data logging or input/output of any setup parameter.

#### **Versatile Alarm and Remote Control Functions (Optional)**

The user can select up to 4 of the following 6 alarm types: high/low limit, deviation high/low limit, rate of change high/low. Optional alarm relay contact outputs are front-panel selectable. Also included is a remote control feature, which lets the user select any 5 of the following functions through the front keypad: recording start/stop; chart speed change; manual printout start; message printout start (up to 5 user-defined messages).



### Specifications

Input	Type*	Measurement Range	Measurement Accuracy	Resolution
T/C	J	-200 to 1100°C (-328 to 2012°F)	±0.15% rdg + 0.5°C (0.9°F); -200 to -100°C (-328 to -148°F): ±0.15% rdg + 0.7°C (1.3°F)	0.1°C
	T	-200 to 400°C (-328 to 752°F)	±0.15% rdg + 0.5°C (0.9°F)	0.1°C
	K	-200 to 1370°C (-328 to 2498°F)	±0.15% rdg + 0.7°C (1.3°F); -200 to -100°C (-328 to -148°F): ±0.15% rdg + 1.0°C (1.8°F)	0.1°C
	E	-200 to 800°C (-328 to 1472°F)	±0.15% rdg + 0.5°C (0.9°F)	0.1°C
	N	0 to 1300°C (32 to 2372°F)	±0.15% rdg + 0.7°C (1.3°F)	0.1°C
	R/S	0 to 1760°C (32 to 3200°F)	±0.15% rdg + 0.1°C (0.2°F); 0 to 100°C (32 to 212°F) ±3.7°C (6.7°F) and 100 to 300°C (212 to 572°F) ±1.5°C (2.7°F)	0.1°C
	B	0 to 1820°C (32 to 3308°F)	±0.15% rdg + 0.1°C above 600°C (0.18°F above 1112°F) 400 to 600°C (752 to 1112°F): ±2.0°C (3.6°F), not specified below 400°C (752°F)	0.1°C
	C(W)	0 to 2315°C (32 to 4199°F)	±0.15% of rdg + 1.0°C (1.8°F)	0.1°C
	J DIN(L)	-200 to 900°C (-328 to 1652°F)	±0.15% rdg + 0.5°C (0.9°F); -200 to -100°C (-328 to -148°F): ±0.15% rdg + 0.7°C (1.3°F)	0.1°C
	T DIN(U)	-200 to 400°C (-328 to 752°F)	±0.15% rdg + 0.5°C (0.9°F)	0.1°C
Vdc	20 mV	-20 to 20 mV	±0.1% rdg + 3-digits	10 μV
	60 mV	-60 to 60 mV	±0.1% rdg + 2-digits	10 μV
	200 mV	-200 to 200 mV	±0.1% rdg + 2-digits	100 μV
	2V	-20 to 20V	±0.1% rdg + 3-digits	1 mV
	6V	-60 to 60V	±0.1% rdg + 3-digits	1 mV
	20V	-20 to 20V	±0.1% rdg + 2-digits	10 mV
	50V	-50 to 50V	±0.1% rdg + 3-digits	10 mV
	1 to 5V	1 to 5V	±0.1% rdg + 2-digits	1 mV
RTD	Pt100	-200 to 600°C (-328 to 1112°F)	±0.15% rdg + 0.3°C (0.5°F)	0.1°C
	JPt100	-200 to 550°C (-328 to 1022°F)	±0.15% rdg + 0.3°C (0.5°F)	0.1°C
<b>Input</b>		<b>Range</b>	<b>Measurement</b>	<b>Limit</b>
Digital input (operation recording)		Input only	Less than 2.4V: off; 2.4 or more: on (TTL)	Contact inputs; contact on/off

\* Note: Thermocouple Type J, K, T, E, R, S, B: ANSI, IEC 584, DIN IEC 584, JIS C 1602-1981; Type N: nicrosil-nisil, IEC 584, DIN IEC 584; Type C W5%-R/W-26%; J DIN, T DIN: DIN 43760.

Pt100: JIS C 1604-1989, JIS C 1606-1989, IEC 751, DIN IEC 751.

JPt100 JIS C 1604-1981, JIS C 1606-1989.

## General Specifications

### Dimensions:

**RD1800B:** 288 W x 288 H x 220 mm D  
(11.4 x 11.4 x 8.66")

**RD100B:** 144 W x 144 H x 220 mm D  
(5.67 x 5.67 x 8.66")

### Weight:

**RD1800B:** 6 dot, 8.4 kg (20 lb);  
24 dot, 9.0 kg (20 lb) approx

**RD100B:** 1 pen, 2.1 kg (4.5 lb);  
2 pen, 3.4 kg (7.5 lb); 3 pen, 3.6 kg  
(7.9 lb); 4 pen, 2.4 kg (6.9 lb);  
6 dot, 2.5 kg (5.5 lb) approx

**Case:** Drawn steel

**Front Door:** Aluminum die casting

### Panel Thickness:

2 x 26 mm (0.078 x 1.02")

**Power:** 90 to 132, 180 to 250 Vac,  
50/60 Hz standard

### Maximum Power Consumption:

Approximately 40 VA

### Ambient Temperature

**and Humidity:** 0 to 50°C (32 to 122°F),  
20 to 80% RH @ 5 to 40°C (41 to 104°F)

**Memory Backup:** Lithium battery

## Input

### Reference Junction Accuracy:

Type J, K, T, E, N, J DIN, T DIN:  $\pm 0.5^\circ\text{C}$ ;  
Type R, S, B, C:  $\pm 1^\circ\text{C}$

### Temperature Coefficients:

Effect of ambient temperature  
of 10°C (50°F)

### Digital Display:

Within  $\pm 0.1\%$  rdg + 1 digit

**Recording:** Within digital  
display  $\pm 0.2\%$  of recording span  
(excluding reference junction)

### Performance Under Reference

### Operating Conditions:

#### Temperature:

$23 \pm 2^\circ\text{C}$  ( $73 \pm 3.6^\circ\text{F}$ )

**Humidity:**  $55 \pm 10\%$

**Usable Power Voltage:** 90 to 132 or  
180 to 264 Vac, 50/60 Hz

**Warm-Up Time:** 30 minutes

### Measurement Intervals:

**Pen Models:** 125 ms/channel

**Dot Models:** RD100B: 1 s/6 channels;  
RD1800B: 2.5 s/6 channels

**Input Resistance:** DC voltage 200 mV  
and lower ranges; T/C ranges: 10 M $\Omega$   
min; DC voltage 2V and higher ranges:  
approx 1 M $\Omega$

**Input Bias Current:** 10 nA max  
(approximately 100 nA on a  
thermocouple input if burnout detection  
selected)

### Thermocouple Burnout Detection:

On/off programmable for each channel or  
more detected as open circuit

**1 to 5 V Burnout:** Less than 0.2V

**Maximum Input Voltage:** 200 mV or  
lower and TC, RTS, DI ranges:  $\pm 10$  Vdc  
continuous; 2 Vdc or greater:  
 $\pm 6$  Vdc continuous

## Recording System

### Recording Span:

**RD100B:** 100 mm

**RD1800B:** 180 mm

**Pen-Writing:** Disposable felt pens  
(analog recording), plotter pens  
(digital recording)

### Dot Printing:

6-color wire dot recording

### Recording Paper:

**RD1800:** 20 m Z-fold chart

**RD100B:** 16 m Z-fold chart

### Step Response Time:

**RD1800:** 1.5 s

**RD100B:** 1 s max

### Deadband:

0.2% of recording span max

### Maximum Recording

**Resolution:** Dot-printing models 0.1 mm

### Recording Format:

Normal, zone and partial recording

### Chart Speed:

**Pen Models:** 5 to 12,000 mm/h  
(82 increments)

**Dot-Printing Models:** 1 to 1500 mm/h  
(1 mm steps)

### Analog Recording Cycles:

**Pen Models:** Continuous

**Dot Printing Models:** 6 dots/10 s;  
12 dots/15 s; 18 dots/20 s,  
24 dots/30 s max

### Print Cycle Time—Dot Printing

**Models:** Auto mode chart speed  
determines analog recording cycle rate;  
fix mode recording is done at fastest  
analog recording interval

**Chart Speed Accuracy:** Less than  
 $\pm 0.1\%$  (chart running more than  
1000 mm continuously and related  
to grid of the paper)

### Message Printout:

5 messages, date/time and message  
up to 16 characters

**Periodic Printout:** Engineering units  
(up to 6 alphanumeric), tag marker  
(up to 7 alphanumeric), scale marker  
(0/100%), the measured data print

### List Printout:

Prints listing of range settings, alarm  
settings and other parameters

**Manual Printout:** Provides a digital  
printout of measured results

## Display System

### Display:

**RD100B:** VFD 254 x 406 mm  
(10 x 16") dot matrix

**RD1800B:** 457 x 406 mm  
(18 x 16") dot matrix

**Display:** Selectable display screen

**Bar Graph Display:** Measured value is  
1% resolution, left-reference or  
center-zero bar graph display (individually  
programmable for each channel)

### Alarms:

**Display:** Alarm setting level indicator;  
channel number (dot-matrix  
models only)

**Levels:** 4 levels/channel

**Types:** High, low, high rate of  
change, low rate of change, delta  
high, delta low (rate of change  
alarm time interval: measurement  
interval x 1 to 15)

**Indications:** Shared alarm indicator  
flashes; in dot-printing models, alarm  
status of alarm channel is  
also displayed

**Recording:** Prints channel number,  
alarm type and time on or off on right  
side of chart



RD1804B shown smaller  
than actual size.

## Optional Alarm Relay Contact Output and Remote Control

**Alarm Relays:** 2, 4, 6 (all units),  
12 and 24 points (RD1800 only);  
outputs programmable; energize or  
de-energize (all relays); hold or non-hold

**Remote Control:** Enables any mix of  
the following to be assigned to 5 contact  
inputs: output programmable, recording  
start/stop; chart speed change; manual  
printout start; alarm acknowledge,  
time adjust; computation start/stop,  
computation restart; message printout  
start (up to 5)

**Input Signal:** TTL, open collector,  
contact

**Input Signal Width:** 1 second minimum

**Contact Capacity:** 3 A @ 250 Vac;  
0.1 A @ 250 Vdc resistive load

## Optional Communication Output

**RS422A/RS485:** Conforms to EIA  
RS422A; can be used to output  
measured values, input and output setup  
parameters

**Addresses:** 1 to 32

### Asynchronous:

Start-stop synchronization

**Communication System:** Half duplex

**Wiring:** 5-wire

**Data Length:** 7 or 8-bit

**Parity:** odd, even or none

**Communication Rate:** 1200, 2400,  
4800, 9600, 19,200, 38,400 baud

### Communication Mode:

ASCII or binary (measured data only)

**Communication Distance:** 1.2 km

**Ethernet Interface:** Electrical and  
mechanical conformance to IEEE8023

**Transmission Media:** 10 Base-T

**Protocol:** TCP, IP, UDP, ICMP, ARP

**CE Option:** Meets European  
standards for EMI interference

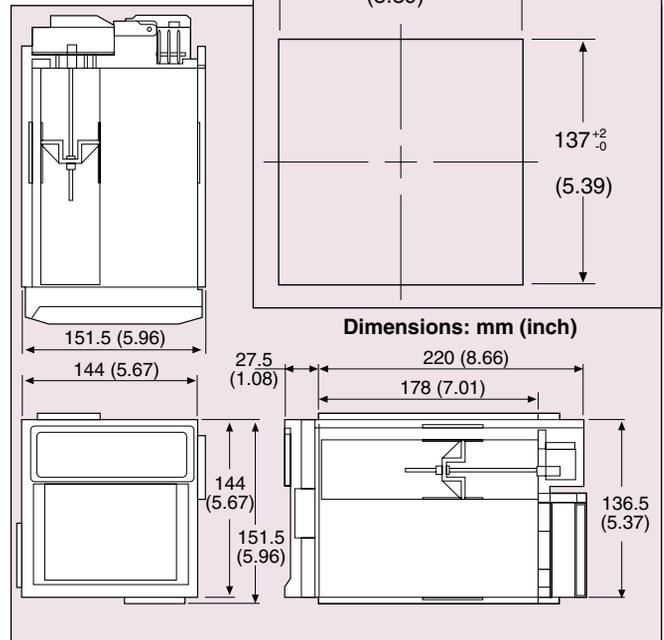
**To Order** Visit [omega.com/rd100b\\_rd1800b](http://omega.com/rd100b_rd1800b) for Pricing and Details

Model No.	Input Channels	Recording Type
RD101B	1	100 mm (4") continuous
RD102B	2	100 mm (4") continuous
RD103B	3	100 mm (4") continuous
RD104B	4	100 mm (4") continuous
RD106B	6	100 mm (4") dot
RD1801B	1	180 mm (7") continuous
RD1802B	2	180 mm (7") continuous
RD1803B	3	180 mm (7") continuous
RD1804B	4	180 mm (7") continuous
RD1806B	6	180 mm (7") dot
RD1812B	12	180 mm (7") dot
RD1818B	18	180 mm (7") dot
RD1824B	24	180 mm (7") dot

Comes complete with 1 pen per channel, 1 pack of paper, mounting brackets and operator's manual.

**Ordering Examples:** **RD104B**, 4-pen recorder with 4-alarm relays.  
**OCW-3**, OMEGACARE<sup>SM</sup> extends standard 2-year warranty to a total of 5 years.

### RD100B Panel Cutout



### Options (Not Field Installable)

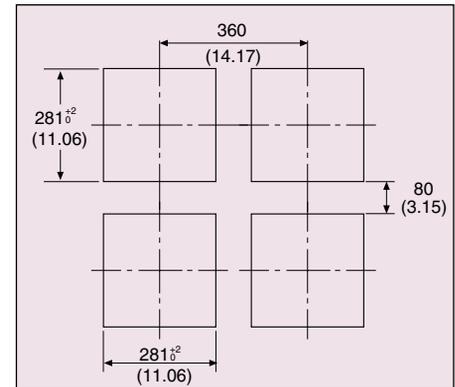
Suffix No.	Description
/A1/R1	2-alarm outputs, remote control
/A2/R1	4-alarm outputs, remote control (RD100A Series only)
/A3/R1	6-alarm outputs, remote control (RD106A and RD1800 Series)
/A4/R1	12-alarm outputs, remote control (RD1806, RD1812, RD1818, RD1824 only)
/A5/R1	24-alarm outputs, remote control (RD1824 only)
/C3	RS422A communications
24V	24 Vdc power (not available on portable unit)
/C7	Ethernet interface, 10 Base-T



OMEGACARE<sup>SM</sup> extended warranty program is available for models shown on this page.

OMEGACARE<sup>SM</sup> covers parts, labor and equivalent loaners. Ask your sales representative for full details when placing an order.

### RD1800B Panel Cutout



### Accessories

Model No.	Description
RD100A-01	Disposable red felt pen channel-1
RD100A-02	Disposable green felt pen channel-2
RD100A-03	Disposable blue felt pen channel-3
RD100A-04	Disposable violet felt pen channel-4
RD100A-11	Plotter pen
RD100B-SW1	Configuration software for models with communication interface
RD100B-SW2	Configuration software for models without communication interface
RD100-RC	6-color print ribbon purple, red, green, blue, brown, black (RD106 only)
RD110-RC	6-color print ribbon for RD1806, RD1812, RD1818 and RD1824
RD100-ZFP-1	Z-fold chart paper (pkg of 1) 100 mm x 16 m (4" x 52') RD100A Series
RD110-ZFP	Z-fold chart paper (pkg of 1) 180 mm x 20 m (7" x 65') RD1800 Series

