Chromalox®
PRECISION HEAT AND CONTROL

ECR1 Paperless Recorder

The *World's First* Paperless Recorder of Its Size with So Many Features

For So Many Applications

Process

- Water and Waste
- Electric utilities
- Gas Utilities
- Metals

- Pharmaceuticals
- Chemical
- Petrochemical
- Food/Beverage/Dairy

- Environmental Monitoring
- Automotive
- Paper and Pulp

Laboratory

OEM

- Environmental Monitoring
- Plastic Extrusion Equipment
- Petrochemical
- Natural Gas

- Food Processing Equipment
- Environmental Chambers
- Furnaces

A Lot of Functionality in a Compact Size

Measuring just 6.5 inches wide by 5.7 inches high and only 6.9 inches deep, what's most remarkable about the Chromalox® ECR1 paperless recorder is its vivid TFT LCD screen capable of displaying 256 colors at a true VGA, 640 x 480 pixel resolution.

Plus the Chromalox ECR1 paperless recorder is packed with so much more:

- 18 isolated analog input channels
- Easy-to-access function keys
- Plug-and-play I/O card slots
- User-configurable I/O card
- Ethernet or optional RS-232/422/485 communication
- Flash ROM, compact flash card, or PC data storage
- Expandable, modular architecture
- Portable/benchtop option

To prolong the life of the LCD screen, an infrared detector automatically deactivates the screen when the operator moves away from it and reactivates it when the operator approaches within six feet.

Easy Set-Up and Operation

Soft keys coupled with interactive dialog make setup easy and operation simple. Data display screens are easily configured using easy-to-access function keys. Process data can be displayed in a variety of formats including vertical and horizontal trends, bar graph, numerical, or mixed. Statistics can be presented with instant, average, and minimum/maximum values. Alarms are programmable and can be displayed in a message-style format.

Fast, Highly Accurate Sampling Rate

The sampling rate of the Chromalox ECR1 paperless recorder is fast: within 200 milliseconds for all channels using a programmable filter or moving average sampling method. With an 18-bit A-D analog input and 15-bit D-A analog output, the ECR1 is extremely accurate.
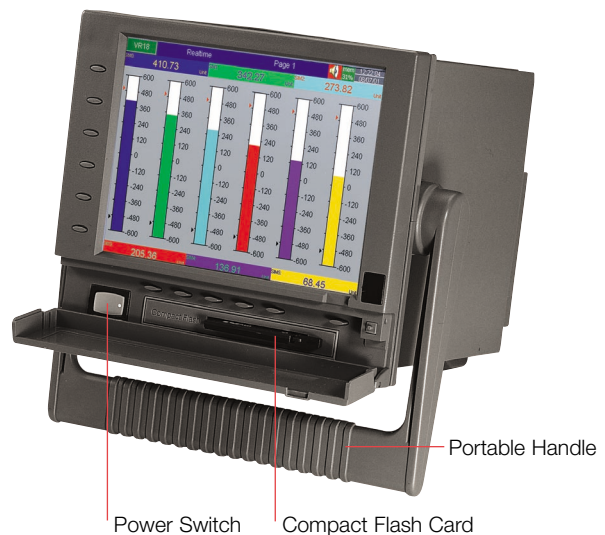
Panel Mounted Model

6.1 in. Color TFT LCD,
640 x 480 Pixel Resolution   Infrared Detector

Bench-Top/Portable Model
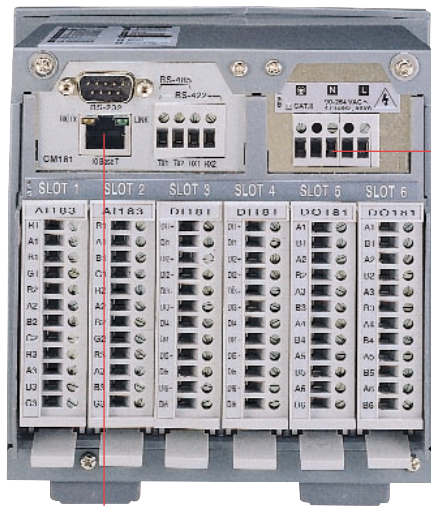

Portable Handle

Power Switch   Compact Flash Card

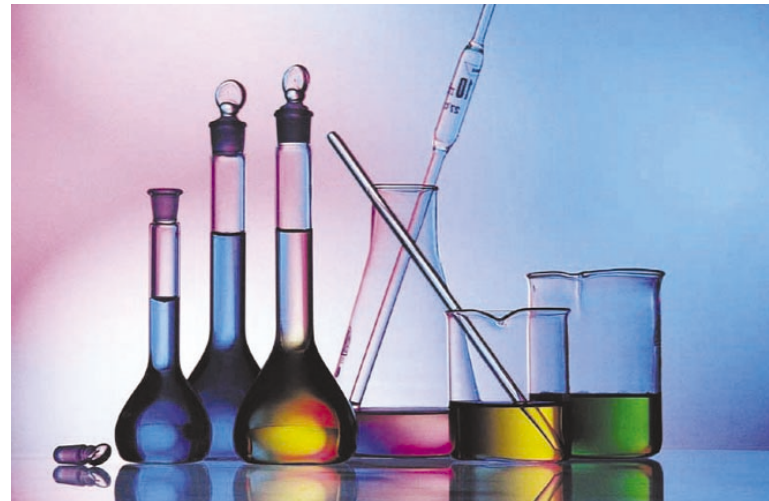# The *World's First* Paperless Recorder
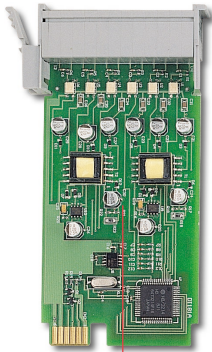
Rear Terminals

Power Supply

6 Slots for Plug & Play I/O Cards, Maximum 18 Analog Input or Mixed with Analog and Digital I/O Cards
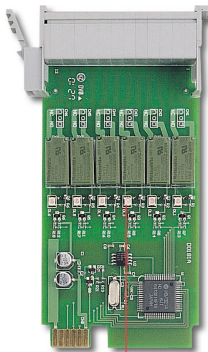
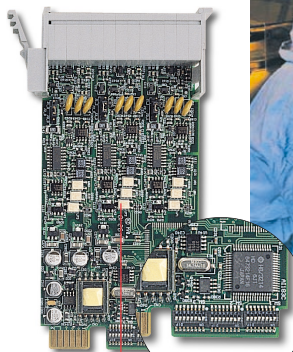Standard Ethernet and Optional RS232/422/485 Ports

Input and Output Cards
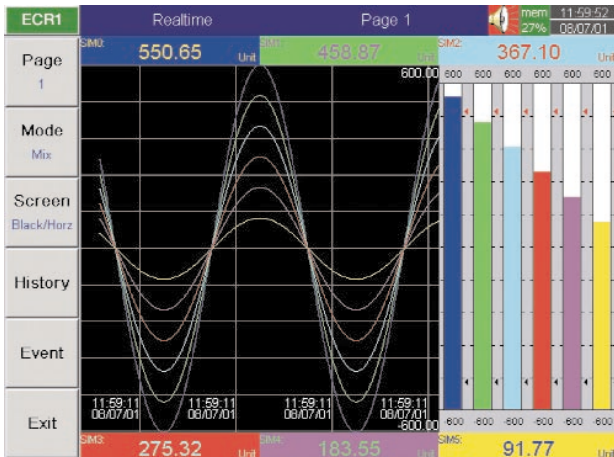
Digital Input

Digital Output (6 Alarms)

Analog Input

Configure Input by DIP Switches

of Its Size with So Many Features

# A Variety of Easy-to-Configure, Easy-to-Navigate Displays

Mixed Mode

- Displays data in bar graph, line trend, and numeric formats
- View a maximum of 6 mixed, real-time data trends simultaneously
- Different colors and tag names readily identify data trends
- "Page" function key easily switches the view to other configured pages
- Displays current Time/Date
- Reminds user of "Alarm" or "Memory Full" conditions

Bar Graph Mode
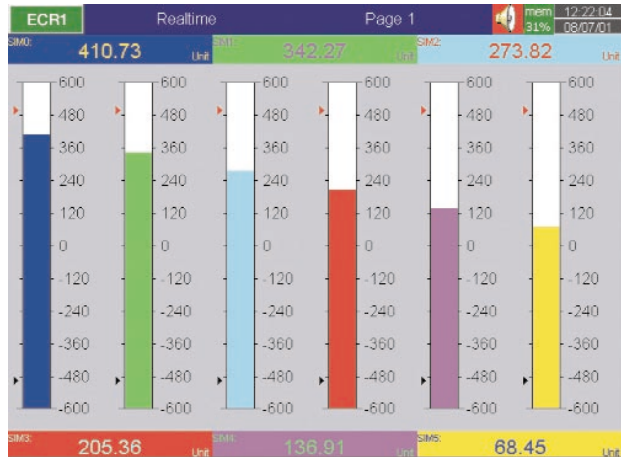
- View a maximum of 6 real-time data values in bar graph format
- Scale set by user in "Configuration"
- Different colors can be used to display data values and tag names with each bar graph
- "Hi/Lo" alarm limits can be marked
- Displays current Time/Date
- Reminds user of "Alarm" or "Memory Full" conditions

Trend Mode
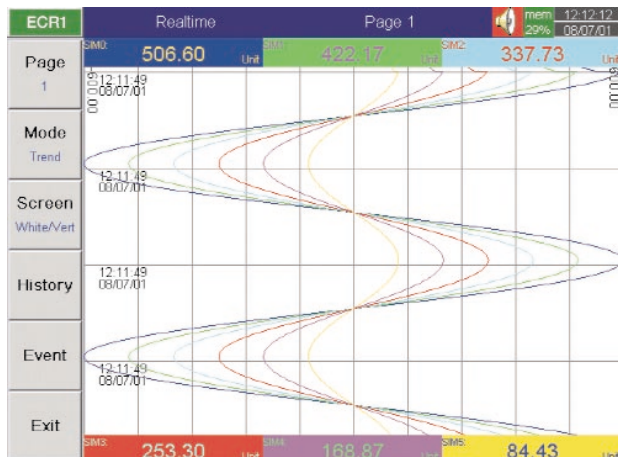
- View a maximum of 6 real-time data trends vertically
- Different colors and tag names readily identify data trends
- "Page" function key easily switches view to other configured pages
- Displays current Time/Date
- Reminds user of "Alarm" or "Memory Full" conditions

Numerical Mode
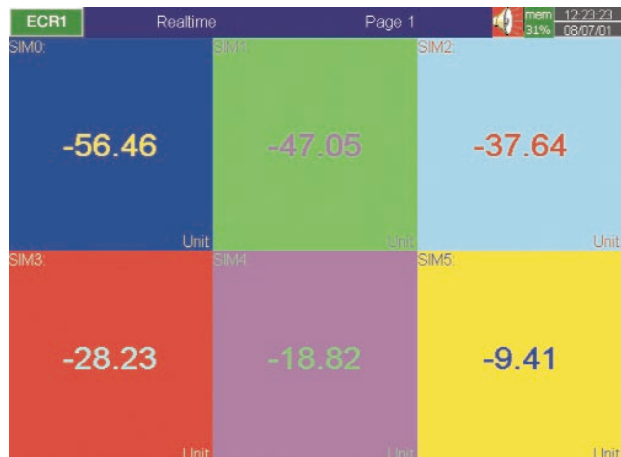

- View a maximum of 6 real-time data points as numbers
- Different colors can be used to display data values and tag names
- "Hi/Lo" alarm limits can be marked
- Displays current Time/Date
- Reminds user of "Alarm" or "Memory Full" conditions

Historical Mode

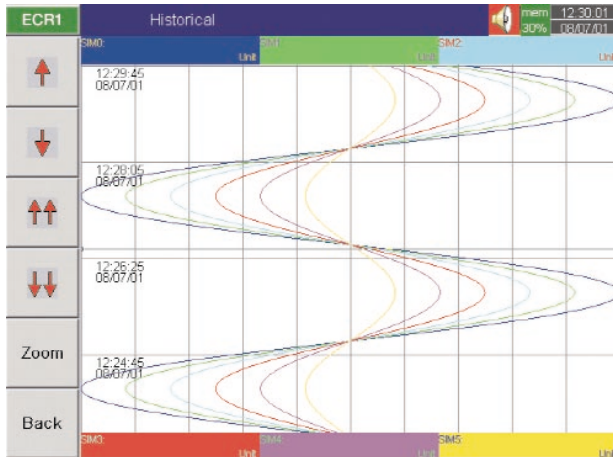- View a maximum of 6 sets of historical data simultaneously
- View desired data sections by using the "Up" and "Down" function keys
- Access precise data values at points selected by moving the "ruler"
- Displays historical data trends and respective data values
- Trends are readily identified by different colors and individual tag names

Alarm List

- Clearly lists all alarm records
- Easily browse through an alarm list or "acknowledge" alarms using function keys
- Color coded bars remind users of an alarm status

Configuration Mode

- Configure pen (Input/Output, Pen Name, Event, Job, etc.)
- Configure page (Color, Pen, Decimal, Pen Width, etc.)
- Configure timer
- Configure instrument (Storage Media, Display, Communication, Time/Date, etc.)

Accessories

Description	Part Number
Single-Channel Analog Input Card	AI181
Dual-Channel Analog Input Card	AI182
Triple-Channel Analog Input Card	AI183
6-Channel Digital Input Card	DI181
6-Channel Relay Output Card (AC/DC)	DO181
RS-2232/422/485 COMM Module	CM181
90-264 Vac, 47-63 Hz Power Supply	PM181
9-18 Vdc Power Supply Module	PM182
18-36 Vdc Power Supply Module	PM183
Portable Handle/Benchtop Assembly Kit	MK183
32 MB Compact Flash Card	CF032
256 MB Compact Flash Card	CF256
Basic PC Software, Observer I	AS181
Extensive PC Software, Observer II	AS182
User's Manual	UMECR1

Installation

Mechanical Data

6.54 in.
(166mm)

5.67 in.
(144mm)

7.56 in.
(192mm)

7.40 in.
(188mm)

.79 in.
(20 mm)

6.85 in.
(174mm)

6.18 in.
(157mm)

5.39 in.
(137mm)

Max. .79 in.
(20mm)

Panel Cutout

Min. 7.87 in.
(200mm)

Min.
7.87 in.
(200mm)

5.43 in.
$(138^{+1}_{-0}mm)$

5.43 in.
$(138^{+1}_{-0}mm)$

Analog Input Card (AI181, AI182, AI183)

4-wire RTD   3-wire RTD   2-wire RTD

R1   A1   B1   G1

TC   mV   V   mA
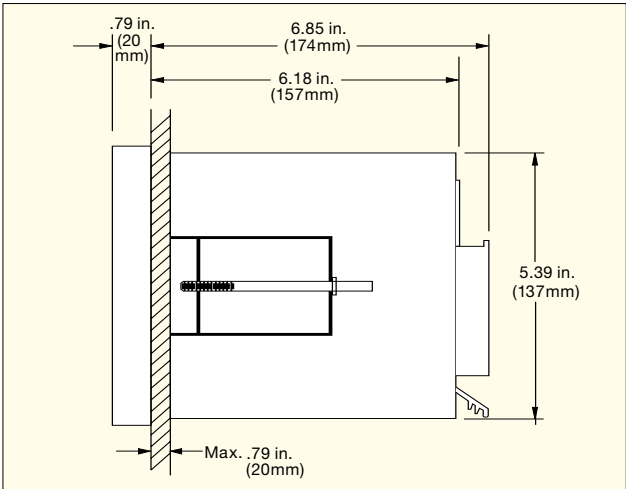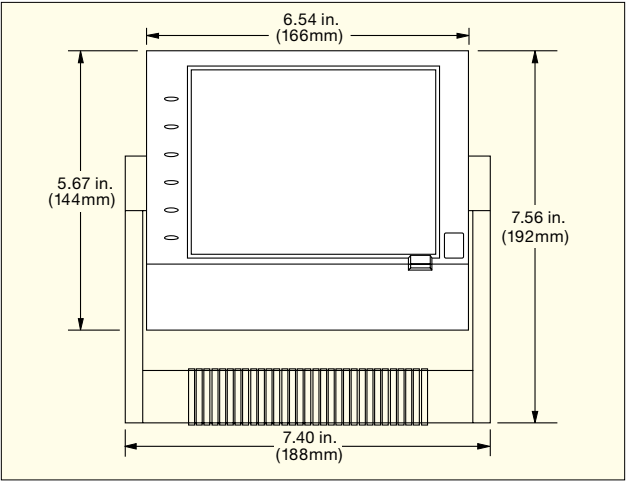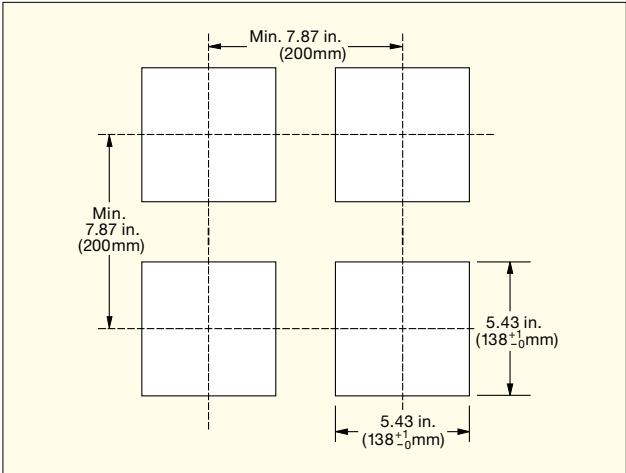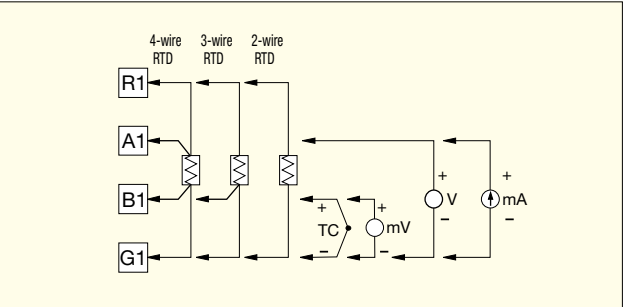
Analog Output Card (AO181)

O1+   O1−   4-20mA   0-20mA   Load R=500 ohms max.

O1+   O1−   0-5V   1-5V   0-10V   Load R=3 K ohms min.

Digital Input Card (DI181)

D1+   D1−   TTL

Digital Output Card (DO181)

Load

A1   B1   5A 240 V   AC or DC

Wiring Cable

Metal Guage
2ϕ max.

4ϕ max.

Bare Length
.4 -.63 in.
(10-16mm)

6
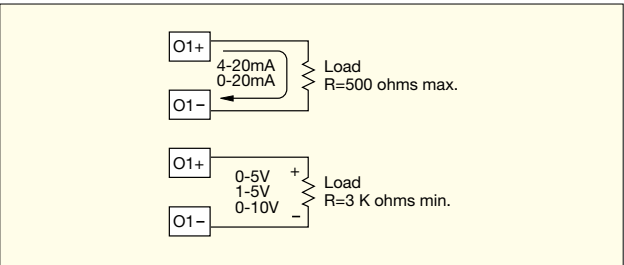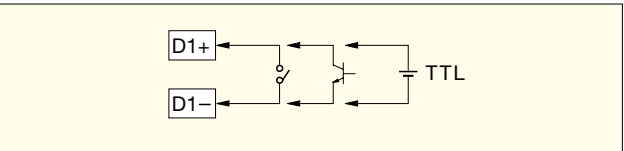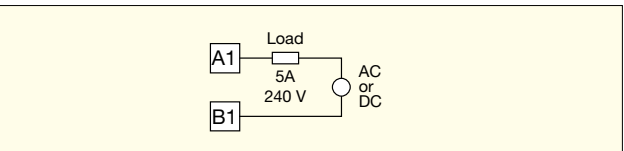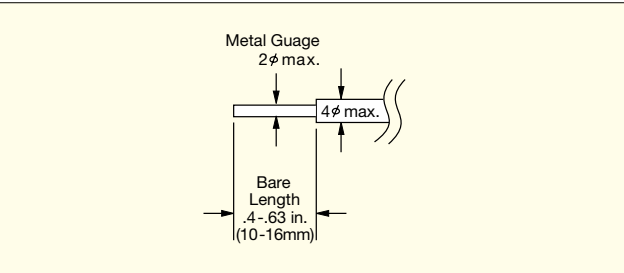
Specifications

Power
90 to 264 Vac, 47 to 63 Hz, 60 VA, 30 W max
11 to 18 or 18 to 36 Vdc 60 VA, 30 W max

Display
6.1 in. (155mm) TFT LCD, 640 x 480 pixels, 256 colors

Memory
Storage Memory On Board 8MB
CF Card, Standard 16MB
CF Card, Optional 64MB, 128MB

Analog Input Card (AI181, AI182, AI183)
Resolution . . . . .18 bits
Sampling Rates . . . . 5 times/second
Maximum Rating . . . . -2 Vdc min, 12 Vdc max
(1 minute for mA input)
Temperature Effect . . . . ±1.5 µV/ºC for all inputs
(except mA input)

. . . . ±3.0 µV/ºC for mA input

Sensor Lead Resistance Effect
T/C . . . . .0.2 µV/Ω
3-wire RTD . . . . 36.7ºF (2.6ºC)/Ω of resistance Δ of 2 leads
2-wire RTD . . . . 36.7ºF (2.6ºC)/Ω of resistance Σ of 2 leads
Burn-Out Current . . . . 200 nA
Common Mode Rejection Ratio (CMRR) . . . . .120 dB
Normal Mode Rejection Ratio (NMRR) . . . . .55 db
Isolation Breakdown Voltage Among Channels . . . . 430 Vac min
Sensor Break Detection
TC, RTD, and mV Inputs . . . . .Sensor Open
4 to 20 mA Input . . . . < 1 mA
1 to 5 V Input . . . . <0.25 V
Other Inputs . . . . Unavailable
Sensor Break Response Time
TC, RTD, and mV Inputs . . . . Within 10 seconds
4 to 20 mA and 1 to 5 V Inputs . . . . 0.1 seconds

Characteristics

Type	Range	Accuracy @ 25ºC	Input Impedence
J	-184º to 1,832ºF (-120º to 1,000ºC)	±2ºF (±1ºC)	2.2 MΩ
K	-328º to 2,498ºF (-200º to 1,370ºC)	±2ºF (±1ºC)	2.2 MΩ
T	-418º to 752ºF (-250º to 400ºC)	±2ºF (±1ºC)	2.2 MΩ
E	-148º to 1,652ºF (-100º to 900ºC)	±2ºF (±1ºC	2.2 MΩ
B	32º to 3,308ºF (0º to 1,820ºC)	±4ºF (±2ºC)	2.2 MΩ
R	32º to 3,214ºF (0º to 1,767.8ºC)	±4ºF (±2ºC)	2.2 MΩ
S	32º to 3,214ºF (0º to 1,767.8ºC)	±4ºF (±2ºC)	2.2 MΩ
N	-418º to 2,372ºF (-250º to 1,300ºC)	±2ºF (±1ºC)	2.2 MΩ
L	-328º to 1,652ºF (-200º to 900ºC)	±2ºF (±1ºC)	2.2 MΩ
PT100 (DIN)	-346º to 1,292ºF (-210º to 700ºC)	±.7ºF (±0.4ºC)	1.3 MΩ
PT100 (JIS)	-328º to 1,112ºF (-200º to 600ºC)	±.7ºF (±0.4ºC)	1.3 MΩ
mV	-8 to 79 mV	±0.05%	2.2 MΩ
mA	-3 to 27 mA	±0.05%	70.5 Ω
0~1 V	-0.12 to 1.15 V	±0.05%	32 kΩ
0~5 V	-1.3 to 11.5 V	±0.05%	332 kΩ
1~5 V	-1.3 to 11.5 V	±0.05%	332 kΩ
0~10 V	-1.3 to 11.5 V	±0.05%	332 kΩ

Digital Input Card (DI181)
Channels . . . . 6 per card
Logic Low . . . . -30 V min, 0.8 V max
Logic High . . . . 2 V min, 30 V max
External Pull-Down Resistance . . . . .1 kΩ
External Pull-Up Resistance . . . . .1.5 MΩ

Digital Output Card (DO181)
Channels . . . . 6 per card
Contact Form . . . . N.O. (Form A)
Relay Rating . . . . 5 A/240 Vac, 200,00 Life Cycles for Resistive Load

COMM Module (CM181)
Interface . . . . RS-232 (1Unit) RS-485 or
. . . . RS-422 (Up to 247 Units)
Protocol . . . . MODBUS Protocol RTU Mode
Address . . . . .1 to 247
Baud Bits . . . . 0,3 to 38.4kB/sec
Data Bits . . . . 7 or 8 Bits
Parity Bit . . . . None, Even, or Odd
Stop Bit . . . . 1 or 2 Bits

Standard Ethernet Communication
Protocol . . . . MODBUS TCP/IP, 10BaseT
. . . . Auto Polarity Correction for 10BaseT
Ports . . . . AUI (Attachment Unit Interface) and
. . . . RJ-45 Auto-Detect Capability

Infrared Detector
Distance . . . . Detects Movement within 2 m

Environmental & Physical
Operating Temperatures . . . . 41º to 122ºF (5º to 50ºC)
Storage Temperatures . . . . 13º to 140º (-25º to 60ºC)
Humidity . . . . 20% to 80% RH (Non-Condensing)
Insulation Resistance . . . . 20 MΩ min @ 500 Vdc
Dielectric Strength . . . . 3,000 Vac 50/60 Hz for 1 minute
Vibration Resistance . . . . 10 to 55 Hz, 10 m/S² for 2 hr
Shock Resistance . . . . 30 m/S² (3g) for Operation,
. . . . 100g for Transportation
Dimensions . . . . 6.5 in./166mm (W) X 5.7 in./144mm (H) x 6.9 in./175mm (D)

Approval Standards
Safety . . . . UL 873 (11th Edition, 1994)
. . . . CSA C22.2 No. 24 to 93
. . . . CE EN610-1 (IEC1010-1)
. . . . Overvoltage Category II, Pollution Degree 2
Protective Class . . . . IP 30, Front Panel Indoor Use
IP 20, Housing and Terminals
EMC . . . . Emission: EN50081-1, EN61326, EN55011 Class B,
EN61000-3-2, EN61000-3-3
. . . . Immunity: EN50082-2, EN61326, EN61000-4-2,
EN61000-4-3, EN61000-4-4, EN61000-4-5
EN61000-4-6, EN61000-4-11, EN50204

Ordering Information

Model ECR1	Paperless Recorder

Code	Power
4	90-264 Vac. 47-63 Hz
6	11-18 Vdc
7	18-36 Vdc

Code	Analog Input Card
3	3 Channels (1 Card*)
6	6 Channels (2 Cards*)
A	9 Channels (3 Cards*)
B	12 Channels (4 Cards*)
C	15 Channels (5 Cards*)
D	18 Channels (6 Cards*)

Code	Digital Input Card
0	None
1	6 Channels (1 Card*)
2	12 Channels (2 Cards*)

Code	Digital Output Card
0	None
1	6 Relays (1 Card*)
2	12 Relays (2 Cards*)

Code	Communications
0	Standard Ethernet Interface
1	RS-232/422/485 (Three in One) + Ethernet Interface
2	Special Order

Code	PC Software
1	Free Basic Software, Observer I for Non-Communication Application
2	Extensive Software, Observer II for Communication via RS232/422/485 or Ethernet

Code	Firmware
0	Basic Function
1	With Mathematics, Counter, and Totalizer

Code	Storage Media
1	32MB Compact Flash (CF) Card
4	256MB CF Card

Code	Case/Mounting
1	Standard Panel Mounting
2	Bench-Top/Portable with Handle

Code	Special Option
0	None
1	24 Vdc Auxiliary Power Supply (for Transmitter, 6 Channels)
2	3-Channel Analog Output
3	6-Channel Analog Output
4	8-Channel Analog Output
5	Panel Mounting with Power Plug
6	Panel Mounting with Power Switch

ECR1 -	4	A	0	0	-	0	1	0	-	1	1	0	Typical Model Number

* Standard model without options, ECR1-4A00010110.

* The rear slots of the recorder will accept only up to 6 cards in any combination.

Chromalox®
PRECISION HEAT AND CONTROL

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