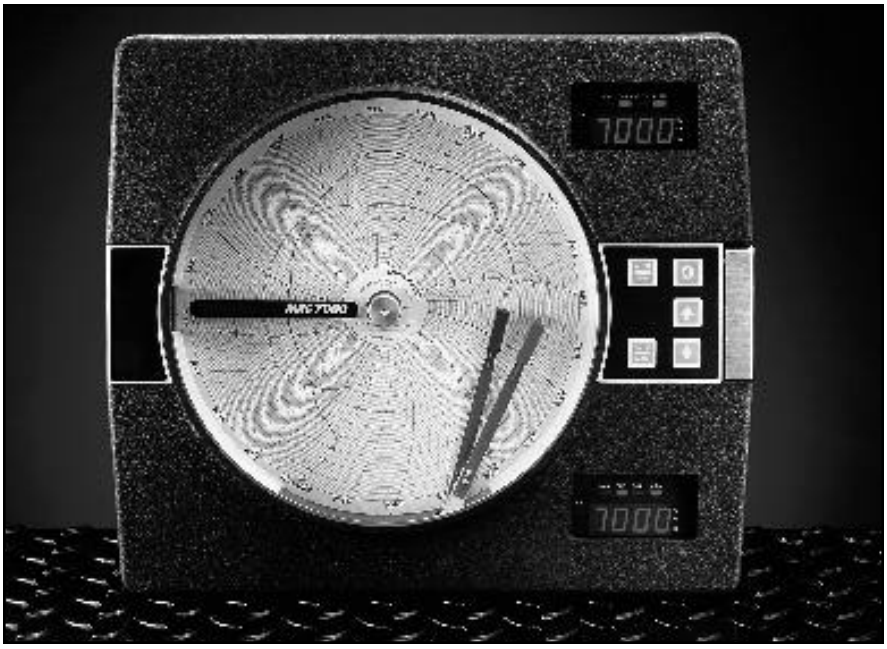
MRC 7000



The popular MRC 7000 line—Recorder, Recording Controller, and Recording Profile Controller.

Record and Control

It prints circles around the competition.

The MRC 7000 line offers three choices: a reliable circular chart recorder, a powerful recording controller, and a versatile recording profile controller. These devices are capable of measuring and recording a variety of process variables, including temperature, pressure, level, and flow.

The MRC 7000 line offers many standard features: universal input capabilities, isolated process input, process value display for each channel, two programmable alarms per channel, selectable scan rate, sensor break and error fault detection, display/chart and process filtering, programmable output action on sensor break/error condition, auto/manual transfer, control setpoint limits, secured access system, and more.

Additionally, many optional features are available with the MRC 7000: single or dual control output, NEMA 3 enclosure, retransmission of process variable, up to 6 relay and four 4 to 20mA outputs, remote setpoint input, remote run/hold, electric motor modulation, 24V DC transmitter power supply, and RS-485 communications. A recording profiler is also available as an option when you order the recording controller; this version of the recording controller profiles on one or two channels.

Recorder functions, alarm settings, and many other parameters are easily configured via the keys on the front cover. All user-configured data can be protected against unauthorized or mistaken changes; this is accomplished by the enable mode security system and protected against data loss due to power failure by a battery back-up.

MRC 7000 SPECIFICATIONS

INPUT

Thermocouple: J, K, T, E, N, R, S, B and C
RTD: Pt100Ω (0.00385Ω/Ω/°C)
Voltage/Current: 0 to 5V DC, 1 to 5V DC, 0 to 25mV DC, 0 to 50mV DC, 10 to 50mV DC, 4 to 20mA DC
Remote Setpoint: 0 to 5V DC
Remote Run/Hold: Dry contact closure

OUTPUTS

Relay: SPST, SPDT; 5A @115V AC, 2.5A @230V AC
SSR Driver: 4V DC @20mA, 3V DC @40mA
Short circuit protected @100mA max.
Current: 0 to 20 or 4 to 20mA DC into 650Ω max.

ALARMS

Relay, SSR Driver
Process Alarm: Direct (High) or Reverse (Low): -9999 to 9999
Deviation Alarm: Direct or Reverse; -3000 to 3000 units
Deviation Band Alarm: Open or closed within band; 1 to 3000 units
Hysteresis: 0 to 300 units

CONTROL PARAMETERS

Proportional Band: 1 to 3000 units
Manual Reset: -1500 to 1500 units
Auto Reset: 0.0 to 100.0 repeats/minute
Rate (Derivative): 0.0 to 10.0 minutes
Cycle Time: 1 to 240 seconds
Pos. Prop. Sensitivity: 0.0 to 50.0%
On/Off Hysteresis: 0 to 300 units
Output Position: -1000 to 1000 units
Control Action: Direct or Reverse
Automatic Transfer: User selectable to transfer from manual to automatic when setpoint is reached. Can be disabled.
Anti-Reset Windup: Auto reset is disabled when the process is outside the proportional band
Auto/Manual: Bumpless transfer
Manual Output: 0 to 100%
Output Limiting: 0 to 100%, High and low
Setpoint Limiting: ±9999

PROFILE PARAMETERS

Profiles: 8 user programmable profiles
Segments: 1 to 6 segments per profile
Ramp/Soak: 1 ramp and soak per segment
Profile time base: User selectable—hours, minutes, second, tenths
Profile interrupt action: User selectable
Profile Loop Count: 1 to 9999, 0 = Continuous
Profile End Control: User selectable
Assured Soak: Available
Pen Profiling Config: Pen 1 only, or Pen 1 and Pen 2
Remote Run/Hold: Optional (model 73XXXXXXXXXX only)
Event Output: 3 possible event outputs per pen

RECORD AND DISPLAY

Chart: 10" circular chart; 100 charts furnished with each instrument
Chart Range: -9999 to 9999 units
Chart Drive: DC stepper motor
Chart Rotation: User configurable from 0.1 to 999.9 hours/revolution
Pen Type: Disposable fiber-tip
Pen Color: Pen 1 - Red, Pen 2 - Green
Digital Displays: Two possible; One per installed pen each having four 7-segment digits measuring 0.56" high with red LEDs.
Status Indicators: LED indicators for alarms, outputs, process limits

DIGITAL COMMUNICATIONS

Type: RS-485 serial communications port. Half-duplex bidirectional communications scheme
Character Format: ASCII
Protocol: Per ANSI X3.28 subcategories 2.5 & A4
Configuration: User configurable to "Monitor" (read only) or "Normal" (read and write)
Bit Rate: User configurable to 300, 600, 1200, 2400, 4800, or 9600 bits per second
Address: User configurable for each pen; 0 to 99

PERFORMANCE

Measurement Error Limit:
Type J, K, T, E, N, C, T/Cs and RTD
±0.25% of reading plus 1 degree @ 25°C
Type R, S, B, T/Cs
±0.25% of span @ 25°C
mVDC and VDC
±0.25% of scaled span plus 1 Least Significant Digit.
Ambient Temperature Error Limit: 0.01% of span per °C deviation from 25 °C
Process Value Output Error Limit: ±0.5% of span
Record Error Limit: ±0.5% of chart span, typical. ± 1% of chart span max.
Scan Rate: 1 scan per second
Display/Record Filter: 1 to 20 scans averaging filter
Pen Resolution: 0.15% of chart span
Recording Deadband: 0.3% of chart span
Pen Response (full scale deflection): 20 seconds
Display Resolution: T/C and RTD: 0.1 or 1°
mVDC and VDC: 0.001, 0.01, 0.1, or 1
Calibration Drift: Self-compensating for ambient temperature. All calibration values are stored in memory
Sensor Fault Detection: Displays "Hi" or "Lo" process input (10% above or below range) and sensor break "SnSr." Pen action on error condition is user configurable to 0 to 100% of chart span
Common Mode Rejection: 90 db min.; 24V AC max. for RTD input; 115V AC max. for other inputs
Normal Mode Rejection: 85 db min. @ 60Hz or greater
Line Voltage: 115/230V AC ±10%, 50/60Hz
Power Consumption: 25VA max.
Operating Temperature: 0 to 55°C, 32 to 131°F
Storage Temperature: -40 to 65°C, -40 to 149°F
Humidity: 0 to 90% RH, non-condensing
ESD: No effect from 5000V static charge over the entire surface area
Agency Approvals: UL Spec. 1092, File # E67237
CSA STD. C22.2 File # LR39885-7
Warranty: 3 years

CE (optional)

PROCESS CONTROL UL LISTED 88BO

CONSTRUCTION

Overall Dimensions: 13.19 H x 15.13 W x 3.63" D
Weight: 20 lbs. max.
Vibration: 0.5 to 100Hz @ 0.2g
Keypad: On front cover
Keys: 3 tactile feedback membrane keys;
Scroll - Selects configuration mode or steps through selected mode
Up- Increases numeric value, exits a mode, or works with other keys for other functions
Down- Decreases numeric value, enters a mode, or works with other keys for other functions
Electrical: 3 or 4 conduit openings provided
Terminal connections via terminal blocks with captive wire clamps, two 12 ga. wires max.
Enclosure: Gasketed cover, case, and chart windows
Material: Black, structural foam
Door Lock: Available; common keyed lock
Windows: Plexiglass
Conduit Openings: Three or four $^1/_2$" conduit openings provided; Sealed conduit connectors available
Mounting: Panel, Wall (using brackets)

MRC 7000 Benefits:

Isolated process input—offers protection from electrical noise

Process value display and value indicator for each pen—conveniently view the process during recording

Up to two programmable alarms per pen—alarm outputs may be either relays or SSR drivers

Sensor-break and error-fault detection—indicates when a sensor has gone bad

Display/chart and process filtering—improved display and recording of "noisy" processes

Tactile keys on the front cover—completely accessible control and programming

Programmable display—user configurable to fit your needs

Decimal point positioning—allows you to change resolution easily

On/Off and PID control—choice of On/Off with hysteresis or full PID

Programmable output action on sensor break/error condition—user-selectable burnout status

Auto/manual control—with bumpless transfer

Security access systems—protect against unauthorized or accidental changes

Digital communications—bi-directional communication with a supervisory computer via RS-485 port

24V DC transmitter power supply for use with mA DC input— additional flexibility

CSA, UL and CE approvals—ensures quality and performance

Three-year warranty—protects you against manufacturing defects

MRC 7000 Option

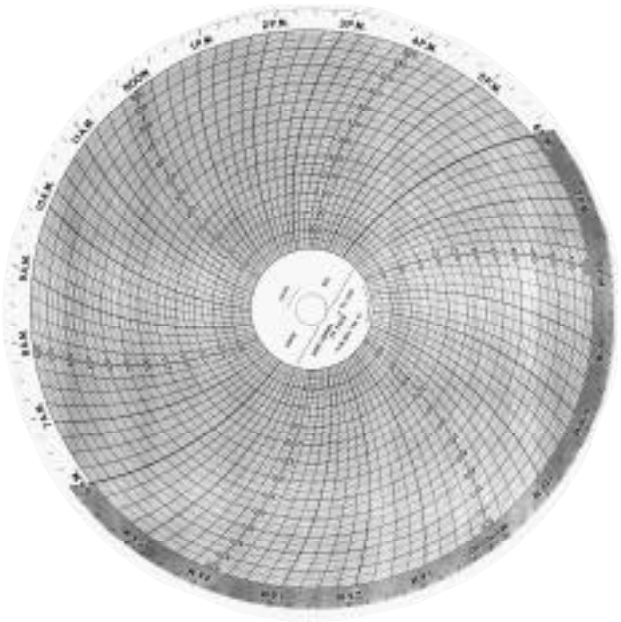
RS-485 COMMUNICATIONS PORT

The MRC 7000 Recorder has an RS-485 communications port option that handles either one or two pen instruments. Each RS-485 communications loop can typically include up to 32 instruments.

This option provides for bi-directional communication with a supervisory computer. Instrument parameters and process values may be read. Some instrument parameters may be changed via the communications port. Alarm settings and alarm hysteresis are adjustable via the RS-485 port.

The MRC 7000 employs a two-wire half-duplex communications scheme. Communications protocol specifies how the basic communications activities are handled as well as the general format or structure of the messages. A RS-485 Communications Protocol document is shipped with each recorder specified with the RS-485 option and provides detailed information regarding message structure and overall communications.

User configurable parameter for setup of RS-485 operations includes an address for each pen, the communications configuration (Monitor only or Normal mode), and the communications bit rate (300, 600, 1200, 2400, 4800 or 9600 bps).



MRC 7000 MODEL CONFIGURATION

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PEN 1	CODE
Recorder only	1
Recording Controller	2
Recording Profile Controller	3
High or Low Limit	4

PEN 2	CODE
None	0
Recorder only	1
Recording Controller	2

* RELAY OUTPUTS	CODE
None	0
One SPST	1
Two SPST	2
Four SPST	4
Six SPST	6
One SPDT	7
Two SPDT	8
Two SPDT and Two SPST	9

* SSR DRIVER OUTPUTS	CODE
None	0
One	1
Two	2
Four	4
Six	6
Eight	8

4 TO 20mA OUTPUTS	CODE
None	0
One	1
Two	2
Three	3
Four	4

TRANSMITTER SUPPLY	CODE
None	0
24V DC Regulated/Isolated	1

OPTION SUFFIX	CODE
None	Blank
NEMA3†	N3
RTD Depression Pen 2	AW
0/100 mVDC Input	AD
N3 plus AW	AE
CE Compliance	CE

VOLTAGE	CODE
115V AC Input	1
115/230V AC Input	2
CSA Approved	
115V AC Input	4
115/230V AC Input	5

ENCLOSURE OPTION	CODE
Standard Cover (plastic windows)	2
Door Lock***	4
Sealed Conduit Connectors	6
Combination 4 & 6***	7

DIGITAL COMMUNICATIONS	
None	0
RS-485 Total Access	2

PEN 2 AUXILIARY INPUT	CODE
None	0
Position Proportioning	1
Remote Setpoint	2

PEN 1 AUXILIARY INPUT	CODE
None	0
Position Proportioning	1
Remote Setpoint	2
Remote Run/Hold**	3

100 charts 0-100°F, 24 hour (standard). Specify non-standard charts.
Surface mounting brackets optional.

* Total quantity of Relay and SSR Driver outputs must be less than or equal to 8. When SPDT Relays are included, the total must be less than or equal to six.
** Applies to Model 73XXXXXXXXX.
*** This option comes with a structural foam cover
† NEMA3 Equivalent Spray Resistant Enclosure

Note: 4-20mA inputs are accommodated using the 1-5V input and a 250Ω shunt resistor, P/N 64411701 (provided with the unit) or the 10-50mV input and a 2.5Ω shunt resistor, P/N 64411702.