

Super-mini Signal Conditioners with Display Mini-M M2E Series

THERMOCOUPLE ALARM

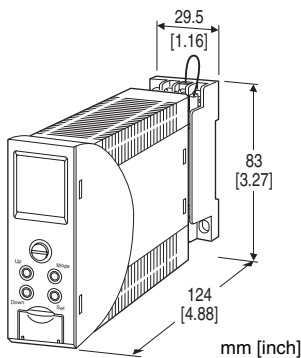
(PC programmable, dual or quad alarm trip)

Functions & Features

- Accepts direct input from a thermocouple and provides a linearized process signal
- Wide selection of thermocouples
- OEL display with good visibility
- Provides relay outputs at preset temperature input
- Quad or dual trip
- Front LCD display indicating values in scaled engineering unit range is used to program the module
- Adjustable deadband (hysteresis)
- ON delay time selectable
- Hi/Lo trip and energized/de-energized coil independently selectable for each setpoint
- Settable with front button
- Enclosed relays
- Relays can be powered by 200 V AC and 100 V DC
- High-density mounting on DIN rail

Typical Applications

- Annunciator
- Various alarm applications



MODEL: M2EAXT-[1]-[2][3]

ORDERING INFORMATION

- Code number: M2EAXT-[1]-[2][3]
- Specify a code from below for each of [1] through [3].
(e.g. M2EAXT-2-M2/Q)
- Specify the specification for option code /Q
(e.g. /C01/S01/SET)

INPUT - Field-selectable

Thermocouple

(PR), K (CA), E (CRC), J (IC), T (CC), B (RH), R, S, C (WRe 5-26), N, U, L, P (Platinel II)

[1] OUTPUT

- 2: 4 points; N.O. or make contact
- 3: 4 points; N.C. or break contact
- 5: 2 points; SPDT or transfer contact

[2] POWER INPUT

AC Power

M2: 100 - 240 V AC (Operational voltage range 85 - 264 V, 47 - 66 Hz)

DC Power

R: 24 V DC

(Operational voltage range 24 V \pm 10 %, ripple 10 %p-p max.)

P: 110 V DC

(Operational voltage range 85 - 150 V, ripple 10 %p-p max.)

[3] OPTIONS

blank: none

/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

TERMINAL SCREW MATERIAL

/S01: Stainless steel

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet
(No. ESU-5152)

Default setting will be used if not otherwise specified.

RELATED PRODUCTS

- M2EA configurator software (model: M2EACFG)

Downloadable at M-System's web site.

A dedicated cable is required to connect the module to the PC. Please refer to the internet software download site or the users manual (EM-5151) for the M2EA configurator for applicable cable types.

GENERAL SPECIFICATIONS

Construction: Plug-in

Connection: M3 screw terminals (torque 0.8 N·m)

Screw terminal: Chromated steel (standard) or stainless steel

Housing material: Flame-resistant resin (gray)
Isolation: input to L1 or L4 alarm output to L2 or L3 alarm output to power
 (for output code 5, L3 alarm output and L4 alarm output is not available)
Burnout protection: Upscale standard; downscale or no burnout optional by programming
 (Set to "None" at item [74] Burnout, when the unit is connected with another instrument in parallel.)
Cold junction compensation: CJC sensor attached to the input terminals
Configuration: Program with front buttons or Via PC.
Programmable features include: Refer to the parameter list.
Configurator connection: 2.5 dia. miniature jack; RS-232-C level

DISPLAY

Display functions: Displays and sets measured range, engineering unit
Display size: Approx. 15.6 × 20.8 mm (0.61" × 0.82")
Number of pixels: 68 × 95 (horizontal × vertical)
Character color: Yellow (reversing display of the current value and the alarm setting value when alarm is tripped)
Display life: Approx. 60000 hours
 (Expected time for the Display brightness to be reduced to 50 % when the Display is used continuously with brightness setting 2 in 25 °C)
Display type: OEL display
Display digit: Negative 5 digits, positive 6 digits (-99999 to 999999)
Decimal point position: None, number of decimal places 1 or 2

INPUT SPECIFICATIONS

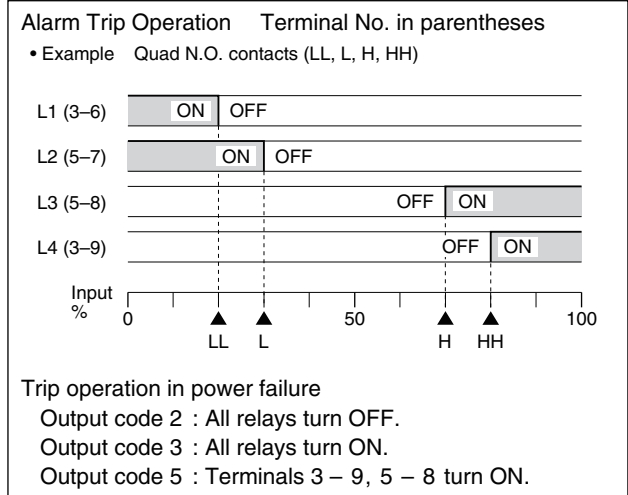
Input resistance: 1 MΩ min.
Burnout sensing: ≤ 0.2 μA
Measurement rang: -5 to +105% of input setting value
 Refer to the operating manual (EM-5152-B) for changing input range, setting value.

OUTPUT SPECIFICATIONS

■ **Quad Alarm**
Relay rating: 100 V AC @ 1 A (cos φ = 1)
 120 V AC @ 1 A (cos φ = 1)
 240 V AC @ 0.5 A (cos φ = 1)
 30 V DC @ 1 A (resistive load)
Maximum switching voltage: 250 V AC or 125 V DC
Maximum switching power: 120 VA or 30 W
Minimum load: 5 V DC @ 10 mA
Mechanical life: 5 × 10⁷ cycles

■ DUAL ALARM

Relay rating: 100 V AC @ 4 A (cos φ = 1)
 120 V AC @ 4 A (cos φ = 1)
 240 V AC @ 2 A (cos φ = 1)
 30 V DC @ 4 A (resistive load)
Maximum switching voltage: 250 V AC or 125 V DC
Maximum switching power: 480 VA or 150 W
Minimum load: 5 V DC @ 10 mA
Mechanical life: 5 × 10⁷ cycles



INSTALLATION

Power Consumption
 • **AC:**
 Max. 6 VA at 100 V
 Max. 7 VA at 200 V
 Max. 8 VA at 264 V
 • **DC:** ≤ 2.5 W
Operating temperature: -5 to +55°C (23 to 131°F)
Operating humidity: 10 to 85 %RH (non-condensing)
Mounting: Surface or DIN rail
Weight: 200 g (0.44 lb)

PERFORMANCE in percentage of FS input

Accuracy: [Table 1 Accuracy value or ±0.1 % of span, whichever is greater + Cold Junction Compensation Error 0.5°C (0.9°F)] ±1 digit.
 See CALCULATION EXAMPLES OF OVERALL ACCURACY.
Cold junction compensation error:
 ±0.5°C at 25 ±10°C
 ±0.9°F at 77 ±18°F
 (The described accuracy may be partially not satisfied when the input temperature is below 0°C. Consult factory.)
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Response time (Filter time constant: 0 sec.): ≤ 0.5 sec.
 (0 - 100 % at 90 % setpoint)
Burnout response: ≤ 10 sec.

Line voltage effect: $\pm 0.1\%$ over voltage range
Insulation resistance: $\geq 100\text{ M}\Omega$ with 500 V DC
Dielectric strength: 2000 V AC @ 1 minute (input to L1 or L4
 alarm output to L2 or L3 alarm output to power to ground)
 (for output code 5, L3 alarm output and L4 alarm output is
 not available)

CALCULATION EXAMPLES OF OVERALL ACCURACY

[Example]

Input Range (PR) thermocouple, 0 - 1600°C

- 1) Absolute value accuracy (Table 1): 2.00°C
 - 2) Convert to %, $2.00^\circ\text{C} \div 1600^\circ\text{C} = 0.125\%$ of span
 - 3) $0.125\% > 0.1\%$ of span. $\Rightarrow 0.125\%$ is selected.
 - 4) CJC error (0.5°C) added: 0.175 % of span
- Accuracy = $\pm(0.175\%$ of span + 1 digit)

[Table 1]

INPUT RANGE	°C			
	MINIMUM SPAN	SETTING RANGE	ACCURACY	CONFORMANCE RANGE
(PR)	20	0 to 1760	± 2.00	0 to 1760
K (CA)	20	-270 to +1370	± 1.00	-150 to +1370
E (CRC)	20	-270 to +1000	± 1.00	-170 to +1000
J (IC)	20	-210 to +1200	± 1.00	-180 to +1200
T (CC)	20	-270 to +400	± 1.00	-170 to +400
B (RH)	20	0 to 1820	± 2.00	400 to 1760
R	20	-50 to +1760	± 2.00	200 to 1760
S	20	-50 to +1760	± 2.00	0 to 1760
C (WRe 5-26)	20	0 to 2315	± 2.00	0 to 2315
N	20	-270 to +1300	± 1.00	-130 to +1300
U	20	-200 to +600	± 1.00	-200 to +600
L	20	-200 to +900	± 1.00	-200 to +900
P (Platinel II)	20	0 to 1395	± 1.00	0 to 1395
INPUT RANGE	°F			
	MINIMUM SPAN	SETTING RANGE	ACCURACY	CONFORMANCE RANGE
(PR)	36	32 to 3200	± 3.60	32 to 3200
K (CA)	36	-454 to +2498	± 1.80	-238 to +2498
E (CRC)	36	-454 to +1832	± 1.80	-274 to +1832
J (IC)	36	-346 to +2192	± 1.80	-292 to +2192
T (CC)	36	-454 to +752	± 1.80	-274 to +752
B (RH)	36	32 to 3308	± 3.60	752 to 3200
R	36	-58 to +3200	± 3.60	392 to 3200
S	36	-58 to +3200	± 3.60	32 to 3200
C (WRe 5-26)	36	32 to 4199	± 3.60	32 to 4199
N	36	-454 to +2372	± 1.80	-202 to +2372
U	36	-328 to +1112	± 1.80	-328 to +1112
L	36	-328 to +1652	± 1.80	-328 to +1652
P (Platinel II)	36	32 to 2543	± 1.80	32 to 2543
INPUT RANGE	K			
	MINIMUM SPAN	SETTING RANGE	ACCURACY	CONFORMANCE RANGE
(PR)	20	273.15 to 2033.15	± 2.00	273.15 to 2033.15
K (CA)	20	3.15 to 1643.15	± 1.00	123.15 to 1643.15
E (CRC)	20	3.15 to 1273.15	± 1.00	103.15 to 1273.15
J (IC)	20	63.15 to 1473.15	± 1.00	93.15 to 1473.15
T (CC)	20	3.15 to 673.15	± 1.00	103.15 to 673.15
B (RH)	20	273.15 to 2093.15	± 2.00	673.15 to 2033.15
R	20	223.15 to 2033.15	± 2.00	473.15 to 2033.15
S	20	223.15 to 2033.15	± 2.00	273.15 to 2033.15
C (WRe 5-26)	20	273.15 to 2588.15	± 2.00	273.15 to 2588.15
N	20	3.15 to 1573.15	± 1.00	143.15 to 1573.15
U	20	73.15 to 873.15	± 1.00	73.15 to 873.15
L	20	73.15 to 1173.15	± 1.00	73.15 to 1173.15
P (Platinel II)	20	273.15 to 1668.15	± 1.00	273.15 to 1668.15

STANDARDS & APPROVALS

EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

Low Voltage Directive

EN 61010-1

Measurement Category II (output)

Installation Category II (power)

Pollution Degree 2

Input or output to power: Reinforced insulation (300 V)

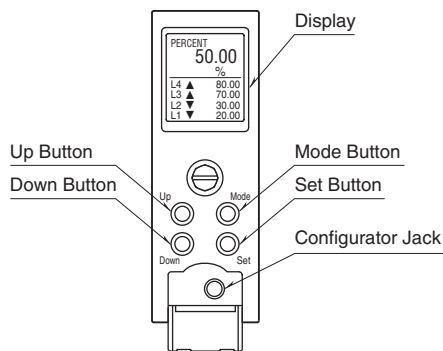
Input to output: Basic insulation (300 V)

L1 or L4 alarm output to L2 or L3 alarm output:

Basic insulation (300 V)

RoHS Directive

EXTERNAL VIEW



COMPONENT	FUNCTION
Display	Indicates present values, setting values and abnormal information. Two types of present values are displayed respectively at the upper and lower parts according to setting.
Mode button	Shifts from Measuring mode to each setting mode. The destination changes depending on how long the button is held down. Pressing Mode button for ≥ 2 seconds returns to Measuring mode from each setting mode..
Set button	Shifts the setting value of each setting parameter item to a setting changeable state. When at setting changeable state, used to move through the digits of setting value for alarm setpoint and to enter (save) the setting value. Used to release latching alarm in measuring mode (press and hold for 2 sec. or more).
Up button	Shifts through setting parameter items and to increase or select the setting value.
Down button	Shifts through setting parameter items and to decrease or select the setting value.
Configurator Jack	Used to perform configuration with M2EA configurator software (model: M2EACFG). When using the software, set the Lockout setting of the unit to 'Lock'.

Refer to the operating manual (EM-5152-B) for detailed procedures.

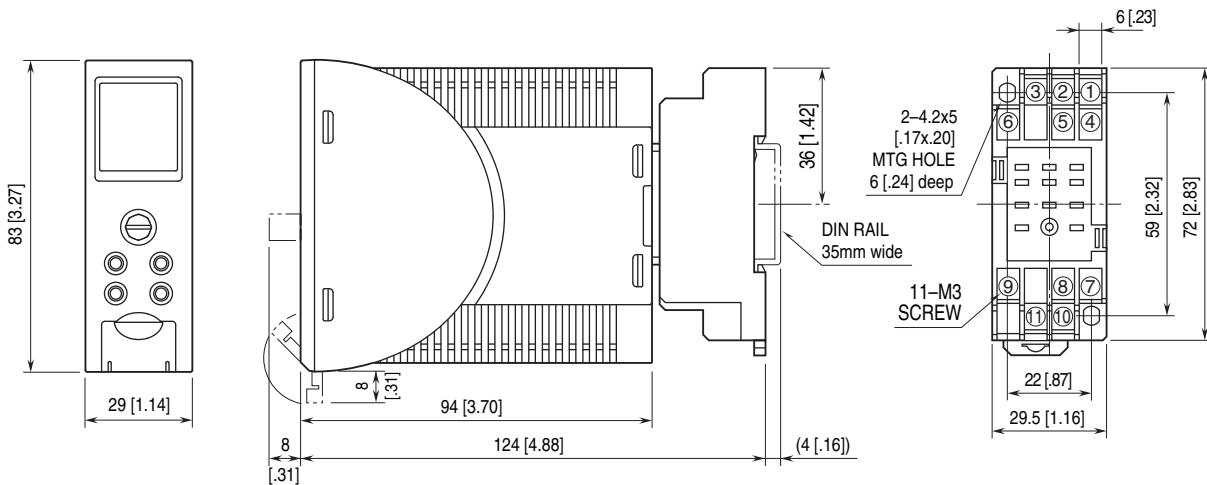
PARAMETER LIST

MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE
Basic setting	01	Lockout setting	Lock / Unlock	—	Lock
	09	Temperature unit	°C / °F / K	—	°C
	10	Input range	(PR) K (CA) E (CRC) J (IC) T (CC) B (RH) R S C (WRe 5-26) N U L P (Platinel II)	—	K (CA)
	12	0 % input setting	(PR): 0.0 – 1740.0 K (CA): -270.0 – 1350.0 E (CRC): -270.0 – 980.0 J (IC): -210.0 – 1180.0 T (CC): -270.0 – 380.0 B (RH): 0.0 – 1800.0 R: -50.0 – 1740.0 S: -50.0 – 1740.0 C (WRe 5-26): 0.0 – 2295.0 N: -270.0 – 1280.0 U: -200.0 – 580.0 L: -200.0 – 880.0 P (Platinel II): 0.0 – 1375.0	°C	0.0
	13	100 % input setting	(PR): 20.0 – 1760.0 K (CA): -250.0 – 1370.0 E (CRC): -250.0 – 1000.0 J (IC): -190.0 – 1200.0 T (CC): -250.0 – 400.0 B (RH): 20.0 – 1820.0 R: -30.0 – 1760.0 S: -30.0 – 1760.0 C (WRe 5-26): 20.0 – 2315.0 N: -250.0 – 1300.0 U: -180.0 – 600.0 L: -180.0 – 900.0 P (Platinel II): 20.0 – 1395.0	°C	1000.0
	16	Input decimal point	No decimal point The number of decimal places : 1 or 2	—	1 place of decimals
	30	L1 alarm enable	Disable / Enable	—	Enable
	31	L1 alarm setpoint	-99999 – 999999*	—	200.0
	32	L1 trip action	High / Low	—	Low
	33	L1 deadband	0 – 999999*	—	1.0
	34	L1 coil at alarm	Energized / De-energized	—	Energized
	40	L2 alarm enable	Disable / Enable	—	Enable
	41	L2 alarm setpoint	-99999 – 999999*	—	800.0 (2 points alarm) 300.0 (4 points alarm)
	42	L2 trip action	High / Low	—	High (2 points alarm) Low (4 points alarm)
	43	L2 deadband	0 – 999999*	—	1.0
	44	L2 coil at alarm	Energized / De-energized	—	Energized
	50	L3 alarm enable	Disable / Enable	—	Enable
	51	L3 alarm setpoint	-99999 – 999999*	—	700.0
	52	L3 trip action	High / Low	—	High
	53	L3 deadband	0 – 999999*	—	1.0
54	L3 coil at alarm	Energized / De-energized	—	Energized	

MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE
Basic setting	60	L4 alarm enable	Disable / Enable	—	Enable
	61	L4 alarm setpoint	-99999 – 999999*	—	800.0
	62	L4 trip action	High / Low	—	High
	63	L4 deadband	0 – 999999*	—	1.0
	64	L4 coil at alarm	Energized / De-energized	—	Energized
	70	Alarm ON-delay time	0 – 999	sec.	0
	71	Power ON-delay time	0 – 999	sec.	5
	72	Latching alarm	Disable / Enable	—	Disable
	89	Alarm test	—	—	Cancel
Option	74	Burnout	None / Down / Up	—	Up
	77	Cold junction compensation	CJM / FXD TEMP	—	CJM
	78	Preset fixed terminal temperature	-50.00 – 100.00*	°C	0.00
	79	Filter time constant	0 – 30	sec.	0
	80	Input Zero fine adjust	-10.00 – 10.00*	°C	0.00
	81	Input Span fine adjust	-10.00 – 10.00*	°C	0.00
Advanced	01	Lockout setting	Lock / Unlock	—	Lock
	91	Display setting	Upper: choose from 3 types* Lower: choose from 5 types*	—	Upper: INPUT Lower: ALARM
	92	Brightness	1 (darkest) – 4 (brightest)	—	4
	93	Display timeout	0 (always on), 1 – 60	min.	10
	94	Reset all settings	OFF / RESET	—	OFF
	95	Version indication	—	—	—
	01	Lockout setting	Lock / Unlock	—	Lock

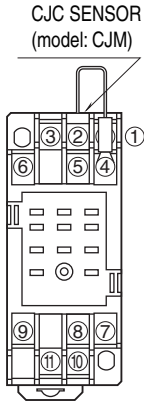
* For detailed setting, refer to the operating manual (EM-5152-B).

EXTERNAL DIMENSIONS unit: mm [inch]



• When mounting, no extra space is needed between units.

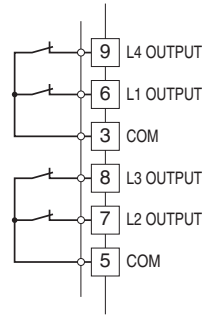
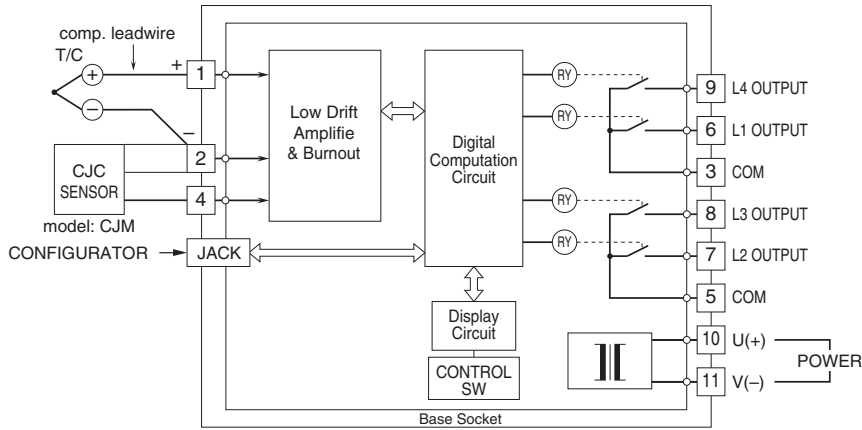
TERMINAL ASSIGNMENTS



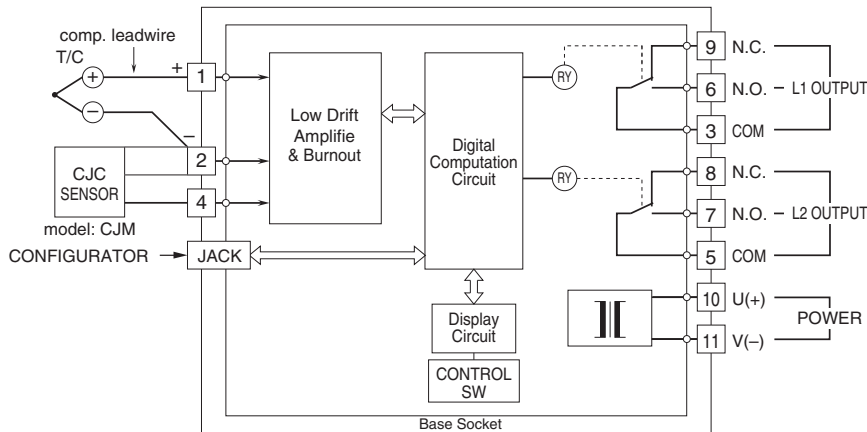
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

■ OUTPUT CODE 2: N.O. RELAY

■ OUTPUT CODE 3: N.C. RELAY

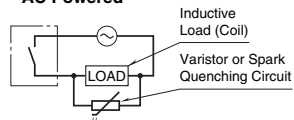


■ OUTPUT CODE 5: SPDT RELAY

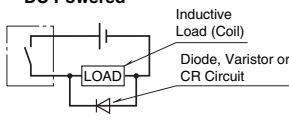


■ Relay Protection

• AC Powered



• DC Powered





Specifications are subject to change without notice.