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

SIGNAL TRANSMITTER
(PC programmable)

Functions & Features
• Converts DC input from a sensor into a standard process signal
• Adjustments with the front button
• OEL display with good visibility

Typical Applications
• Isolation between control room and field instrumentation
• Ideal for quick spare part

MODEL: M2EXV–[1][2]

ORDERING INFORMATION
• Code number: M2EXV-[1][2]
Specify a code from below for each [1] and [2].
(e.g. M2EXV-M2/Q)
• Specify the specification for option code /Q
(e.g. /C01/S01/SET)

INPUT - Field-selectable
◆ DC Input
• Current input: 0 - 50 mA DC
• Voltage input: -1000 - +1000 mV DC
• Voltage input: -10 - +10 V DC

OUTPUT - Field-selectable
◆ DC Output
• Current output: 0 - 20 mA DC
• Voltage output: -5 - +5 V DC
• Voltage output: -10 - +10 V DC

[1] 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 ±10 %, ripple 10 %p-p max.)
P: 110 V DC
(Operational voltage range 85 – 150 V, ripple 10 %p-p max.)

[2] 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-5133)

RELATED PRODUCTS
• M2E configurator software (model: M2ECFG)
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-5147) for the M2E 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 output to power
Overrange output: Approx. -5 to +105 % (Not available for current output not greater than 0 mA)
Zero fine adjustment: -5 to +5 % (front button)
Span fine adjustment: 95 to 105 % (front button)
Output setting: DIP Switch on side panel (refer to the instruction manual)
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 x 20.8 mm (0.61” x 0.82”)
Number of pixels: 68 x 95 (horizontal x vertical)
Character color: Yellow
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: Selectable

INPUT SPECIFICATIONS

■ DC Current
Input resistance: Incorporated (24.9 Ω)
Input range: 0 - 50 mA DC
Minimum span: 2 mA
Offset: Lower range can be any specific value within the input range provided that the minimum span is maintained.
The measurement available for -5 - +105% of input setting range.

■ DC Voltage
• Narrow Spans (mV)
  Input range: -1000 - +1000 mV DC
  Minimum span: 100 mV
• Wide Spans (V)
  Input range: -10 - +10 V DC
  Minimum span: 1 V
Offset: Lower range can be any specific value within the input range provided that the minimum span is maintained.
Input resistance: 1 MΩ minimum
The measurement available for -5 - +105% of input setting range.

OUTPUT SPECIFICATIONS

■ DC Current
Output range: 0 - 20 mA DC
Conformance range: 0 - 21mA DC
Minimum span: 1 mA
Offset: Lower range can be any specific value within the output range provided that the minimum span is maintained.
Load resistance: Output drive 15 V max.
(Not available to output less than 0 mA, output range may not be extended to -5 %)

■ DC Voltage
Output range: -5 - +5 V DC, -10 - +10 V DC
Conformance range: -5.5 - +5.5 V DC, -11 - +11 V DC
Minimum span: 250 mV, 1 V
Offset: Lower range can be any specific value within the output range provided that the minimum span is maintained.
Load resistance: Output drive 1 mA max.

INSTALLATION

Power Consumption
• AC:
  Max. 4.5 VA at 100 V
  Max. 6.5 VA at 200 V
  Max. 8.5 VA at 264 V
• DC: Max. 2.3 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: Approx. 200 g (0.44 lb)

PERFORMANCE (without linearization)

Accuracy: Input accuracy + output accuracy
See CALCULATION EXAMPLES OF OVERALL ACCURACY.
Inversely proportional to the setting span.
Except the accuracy of input resistor.
Input accuracy: (% of max. input range)
-1000 - +1000 mV : ±0.01 %
-10 - +10 V : ±0.01 %
0 - 50 mA : ±0.02 %

Display accuracy:
Input display: Input accuracy ±1 digit
Output display: Input accuracy + output accuracy ±1 digit
Output accuracy: ±0.04 % of max. output range
Temp. coefficient (% of max. I/O range): ±0.015 %/°C
(±0.008 %/°F)
Input resolution: Max. 16 bits
Output resolution: Max. 16 bits
Response time (filter time constant: 0 sec.): ≤ 0.5 sec.
(0 - 90 %)
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 2000 V AC @1 minute  (input to output to power to ground)

CALCULATION EXAMPLES OF OVERALL ACCURACY

[Example] Input Range -10 - +10 V, Input Setting 1 - 5 V,
Output Range 0 - 20 mA, Output Setting 4 - 20 mA

Overall accuracy
• Input Accuracy = Input Range Span (20 V) ÷ Input Span Setting (4 V) x 0.01 % = 0.05 %
• Output Accuracy = Output Range Span (20 mA) ÷ Output Span Setting (16 mA) x 0.04 % = 0.05 %
Overall Accuracy = 0.05 + 0.05 = ±0.10 %
STANDARDS & APPROVALS

EU conformity:
- EMC Directive
  - EMI EN 61000-6-4
  - EMS EN 61000-6-2
- Low Voltage Directive
  - EN 61010-1
- Installation Category II
- Pollution Degree 2
- Input or output to power: Reinforced insulation (300 V)
- Input to output: Basic insulation (300 V)
- RoHS Directive
  - EN 50581

EXTERNAL VIEW

![External View Diagram]

COMPONENT | FUNCTION
--- | ---
Display | Indicates present values, setting values and abnormal information. Two types of present values at upper and lower are displayed by setting.
Mode Button | Used to shift from measuring mode to each setting mode. Destination to be shifted is changed by the time pressing and holding the button. Used to return from each setting mode to measuring mode (press and hold for 2 sec. or more).
Set Button | Used to change setting value of setting parameter. When at setting changeable state, used to enter (save) the setting value. Used to move on through digits of setting value for input/output scaling at setting changeable state.
Up Button | Used to shift through setting parameter, and to increase or select setting value.
Down Button | Used to shift through setting parameter, and to decrease or select setting value.
Configurator Jack | Used to configure with M2E configurator software (model: M2ECFG). At the same time, set the lockout setting of the unit to 'lock'.

Refer to the operating manual (EM-5133-B) for detailed procedures.
### PARAMETER LIST

It is available to configure or confirm settings shown below by using front button. Configuring or confirming with PC is available when using M2E configurator software (model: M2ECFG).

<table>
<thead>
<tr>
<th>MODE</th>
<th>ITEM</th>
<th>SETTING</th>
<th>PARAMETER</th>
<th>RANGE</th>
<th>UNIT</th>
<th>INITIAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic setting</td>
<td>01</td>
<td>Lockout setting</td>
<td>Lock / Unlock</td>
<td>—</td>
<td>Lock</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Input range</td>
<td>0 – 50 mA</td>
<td>—</td>
<td>mA</td>
<td>0 – 50 mA</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>0 % input setting</td>
<td>0.00 – 48.00 mA</td>
<td>—</td>
<td>mA</td>
<td>4.00</td>
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<tr>
<td></td>
<td>13</td>
<td>100 % input setting</td>
<td>2.00 – 50.00 mA</td>
<td>—</td>
<td>mA</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>0 % input scaling</td>
<td>-99999 – 999999</td>
<td>—</td>
<td>%</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>100 % input scaling</td>
<td>-99999 – 999999</td>
<td>—</td>
<td>%</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Input decimal point</td>
<td>No decimal point</td>
<td>The number of decimal places: 1 – 5</td>
<td>—</td>
<td>2 places of decimals</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Output range</td>
<td>0 – 20 mA</td>
<td>—</td>
<td>mA</td>
<td>0 – 20 mA</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>0 % output setting</td>
<td>0.000 – 19.000 mA</td>
<td>—</td>
<td>mA</td>
<td>4.000</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>100 % output setting</td>
<td>1.000 – 20.000 mA</td>
<td>—</td>
<td>mA</td>
<td>20.000</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>0 % output scaling</td>
<td>-99999 – 999999</td>
<td>—</td>
<td>%</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>100 % output scaling</td>
<td>-99999 – 999999</td>
<td>—</td>
<td>%</td>
<td>100.00</td>
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<tr>
<td></td>
<td>22</td>
<td>Output decimal point</td>
<td>No decimal point</td>
<td>The number of decimal places: 1 – 5</td>
<td>—</td>
<td>2 places of decimals</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>Loop test</td>
<td>-5.00 – 105.00 %</td>
<td>—</td>
<td>%</td>
<td>Cancel</td>
</tr>
<tr>
<td>Option</td>
<td>60</td>
<td>Unit (INP Scaling)</td>
<td>Choose from 68 types*</td>
<td>—</td>
<td>%</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>61</td>
<td>Unit (OUT Scaling)</td>
<td>Choose from 68 types*</td>
<td>—</td>
<td>%</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>Filter time constant</td>
<td>0 – 30 sec.</td>
<td>—</td>
<td>sec.</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>69</td>
<td>Input Zero fine adjust</td>
<td>-5.000 – 5.000 %</td>
<td>—</td>
<td>%</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>70</td>
<td>Input Span fine adjust</td>
<td>95.000 – 105.000 %</td>
<td>—</td>
<td>%</td>
<td>100.000</td>
</tr>
<tr>
<td></td>
<td>71</td>
<td>Output Zero fine adjust</td>
<td>-5.000 – 5.000 %</td>
<td>—</td>
<td>%</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>72</td>
<td>Output Span fine adjust</td>
<td>95.000 – 105.000 %</td>
<td>—</td>
<td>%</td>
<td>100.000</td>
</tr>
<tr>
<td></td>
<td>01</td>
<td>Lockout setting</td>
<td>Lock / Unlock</td>
<td>—</td>
<td>Lock</td>
<td></td>
</tr>
<tr>
<td>Advanced</td>
<td>90</td>
<td>Display setting</td>
<td>Upper: choose from 5 types* Lower: choose from 6 types*</td>
<td>—</td>
<td>Upper: INPUT Lower: PERCENT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>91</td>
<td>Brightness</td>
<td>1 (darkest) – 4 (brightest)</td>
<td>—</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>92</td>
<td>Display timeout</td>
<td>0 (always on), 1 – 60 min.</td>
<td>—</td>
<td>min.</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>93</td>
<td>Reset all settings</td>
<td>OFF / RESET</td>
<td>—</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>94</td>
<td>Version indication</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td></td>
<td>01</td>
<td>Lockout setting</td>
<td>Lock / Unlock</td>
<td>—</td>
<td>Lock</td>
<td></td>
</tr>
<tr>
<td>Linearization</td>
<td>100</td>
<td>User's table linearization</td>
<td>Disable / Enable</td>
<td>—</td>
<td>Disable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>166</td>
<td>Number of points</td>
<td>2 – 111</td>
<td>—</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>167 – 388</td>
<td>Table</td>
<td>-5.00 – 105.00</td>
<td>%</td>
<td>X001 -5.00 Y001 -5.00 X002 105.00 Y002 105.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>01</td>
<td>Lockout setting</td>
<td>Lock / Unlock</td>
<td>—</td>
<td>Lock</td>
<td></td>
</tr>
</tbody>
</table>

* For detailed types, refer to the operating manual (EM-5133-B).
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)

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

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

⚠ Specifications are subject to change without notice.