Introduction
The Millivolt Conversion Module converts a DC millivolt input into 1 to 5V DC or 4 to 20 mA. The J-SMV Module is available for one-output (J-SMV90) or two-output (J-SMV95) model. The J-SMV provides a linearization function as a standard, which employs up to 101 linearization points to allow a linear output. With the filter function for input and output, the Millivolt Conversion Module can convert signals stably in response to the application. The range, linearization function, filter function changes, and other such setting changes are easily done with the dedicated Loader Software, which operates on a general-purpose PC. Complete isolation is employed between the power, input, and output circuits. In the two-output model, isolation is also employed between the two output circuits.

Specification
- Input signal: DC millivolt (mV DC)
- Span: ±100 mV DC rating, ±120% range
- Burnout signal: Upscale or Downscale (Specify when ordering.)
- Burnout response: Within 30 sec
- Output signal:
  - No. 1 output: 1 to 5V DC or 4 to 20 mA DC
  - No. 2 output: 1 to 5V DC (Between No. 1 and No. 2 outputs is isolated.)
  - Edge connector output: 1 to 5V DC (No. 1 output must be 1 to 5V DC when connecting the signal with the A-MC I/O cable.)
- Output impedance:
  - Voltage output: 250 Ω or less, Current output: 250 kΩ or more
- Output range: -20 to +120%FS
- Allowable load resistance: 0 to 600Ω (Current output: Up to +110%)
- Output update interval: 5 msec (Output hardware filtering 0 to 90% response, 50 msec)
- Input/output response:
  - Minimum of 160 msec, 0 to 90% response (When moving average and 0.1-sec first-order lag filtering are not used)
- Accuracy:

<table>
<thead>
<tr>
<th>Input span</th>
<th>Both output Nos. 1 and 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 mV or more</td>
<td>±0.15%FS</td>
</tr>
<tr>
<td>Less than 10 mV</td>
<td>±0.15% x Measurement full-scale setting value [mV] / Set span width [mV]</td>
</tr>
</tbody>
</table>

- Insulation resistance: 500V DC, 100 MΩ min (Mutual between input - output - GND - power terminal)
- Withstand voltage: 1000V AC, 1 minute (Mutual between input - output - GND - power terminal)
- Power supply: 24V DC, ±15%
- Current consumption: 130 mA or less (at 24V DC)

- Ambient temperature:
  - Normal operating condition: 5 to 45°C
  - Operation limit: 0 to 50°C
- Ambient humidity: 0 to 90%RH (No condensation allowed)
- Mounting: File
- Front mask color: Black
- Weight: 250 g
- Operating influence:
  - Supply voltage effect: ±0.1%FS/24V DC, ±0.15%FS/10°C
  - Temperature effect: ±0.1%FS/10°C
- Load range:
  - Linearization table: 101 points
  - Input filtering: Unavailable/available (Moving averaging)
  - Zero-span adjustment: Adjustable between -20 and +120%FS
  - First-order lag filtering: Without/with (0 to 20.0 sec, 63% response time)

Note: Burnout (Upscale, Downscale) is specified by hardware. Please specify it when ordering. It will be set to Upscale unless otherwise specified.
## Model Number Table

### One-output model

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Selections</th>
<th>Additions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J-SMV90</td>
<td>I</td>
<td>I</td>
<td>Millivolt conversion module (1-output)</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
<td>No varnish coated</td>
</tr>
<tr>
<td>C</td>
<td>-0</td>
<td></td>
<td>Varnish coated</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>Input mV input</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0</td>
<td></td>
<td>Output 1 to 5V DC</td>
</tr>
<tr>
<td></td>
<td>-1</td>
<td></td>
<td>With test report</td>
</tr>
</tbody>
</table>

### Two-output model

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Selections</th>
<th>Additions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J-SMV95</td>
<td>I</td>
<td>I</td>
<td>Millivolt conversion module (2-output)</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
<td>No varnish coated</td>
</tr>
<tr>
<td>C</td>
<td>-0</td>
<td></td>
<td>Varnish coated</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>Input: mV input</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0</td>
<td></td>
<td>No. 1 output 1 to 5V DC, No. 2 output 1 to 5V DC</td>
</tr>
<tr>
<td></td>
<td>-1</td>
<td></td>
<td>With test report</td>
</tr>
</tbody>
</table>

Example: J-SMV90-X-01-0

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Figure 1. Functional block diagram of millivolt conversion module
No. | Description
---|---
1  | (Note 1) 250 Ω resistor is added for current input.
2  | (Note 1) Input (-)
3  | Input (+)
4  | Output 1
5  | Output 1
6  | Output 2
7  | Output 2
8  | (Note 1)
9  | GND

Note 1) 250 Ω resistor is added for current input.
2) Operate the module with a cover.
3) Terminal screws: M3.5
4) Use the pressurized terminals with insulation sheath.

Figure 2. Dimensions and wiring diagram
When ordering, please specify:
1) Tag number
2) Input range* [Set to 0 to 100 mV by default]
3) Burnout (Upscale, Downscale) [Set to Upscale by default]

The following are also set by default:
- a) Input filtering: Moving average available
- b) First-order lag filtering: Available, 0.1 sec

* Use the quick list below when specifying the range. Ranges other than those below are also accepted.

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Input range</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>0 to 5 mV</td>
</tr>
<tr>
<td>02</td>
<td>0 to 10 mV</td>
</tr>
<tr>
<td>03</td>
<td>0 to 20 mV</td>
</tr>
<tr>
<td>04</td>
<td>0 to 50 mV</td>
</tr>
<tr>
<td>05</td>
<td>0 to 100 mV</td>
</tr>
</tbody>
</table>