SystempaK (Digital/Single Case) Integrator Module
Model J-SAP 90

Introduction
The Integrator Module (J-SAP90) is a signal conversion module housed in a single case and converts an input signal to a pulse and continuously counts it in conjunction with the counter. In addition to the proportional integration of inputs linearly, the Integrator Module, which provides the input linearization function as a standard function, can serve alone as a square root extractor. Function setting changes on the Integrator Module can be performed easily with the dedicated Loader Software, which operates on a general-purpose PC.

Specification
- **Input signal:** 1 to 5V DC or 4 to 20 mA DC
- **Input impedance:** 1 MΩ (voltage input), 250 Ω (current)
- **Input linearization:** 101 linearization points
- **Square root extraction:** Input linearization is used (dropout function available).
- **Output circuit (Specifying of model):** Triac (for driving the AC/DC electromagnetic counter) or open collector
- **Maximum allowable load:**
  - Triac: 24V DC 250 mA
  - Open collector: 30V DC 30 mA
- **ON voltage:**
  - Triac: 2V or less
  - Open collector: 0.4V or less
- **ON current:**
  - Triac: 250 mA or less
  - Open collector: 30 mA or less
- **Input low-level cut:** Specifying of low cut value by %.
- **Output low-level cut:** Specifying of low cut frequency (7 digits).
- **Accuracy:** See the accuracy table:
<table>
<thead>
<tr>
<th>Maximum output frequency setting</th>
<th>Output span width</th>
<th>Output accuracy % of output span</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000278 HzFS to 1 kHzFS</td>
<td>When 50% or more of frequency set maximum output:</td>
<td>±0.1%</td>
</tr>
<tr>
<td></td>
<td>When 50% or less of ditto:</td>
<td>±0.1%/ (“Full-scale set output frequency”/2) / (“Full-scale set output frequency” - “0% set output frequency”).</td>
</tr>
<tr>
<td>1 kHzFS to 2 kHzFS</td>
<td>---</td>
<td>±0.2%/ (“Full-scale set output frequency”/2) / (“Full-scale set output frequency” - “0% set output frequency”).</td>
</tr>
</tbody>
</table>

- **Arithmetic period:** 5 msec
- **Input/output response:**
  - Minimum of 120 msec (0 to 90% response)
  - Insulation resistance: 500V DC, 100 MΩ min.
  - Withstand voltage: 1000V AC, 1 minute
- **Power supply:** 24V DC ±10 %
- **Current consumption:** 200 mA or less (at 24V)
- **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:** Panel, wall, DIN rail attachment
- **Color of front mask:** Black
- **Weight:** 400 g
- **Operating influence:**
  - Supply voltage effect: ±0.1%/FS/24V DC ±10 %
  - Temperature effect: ±0.15%/FS/10°C
- **Loader settings:**
  - Module ID: 16 one-byte characters, 8 two-byte kanji characters
  - Input scaling setting: Zero span setting within input range (Setting of an input such as 0, 100% at each input)
  - Linearization setting: 101 points
  - Input filtering: Unavailable/available (Moving average)
  - Output low-level cut: Without/with (Low-level cut frequency is variable; Specify it by frequency in 7 digits.)
  - Pulse width type: Selectable from 50% duty, or fixed on-pulse, or fixed off-pulse.
  - Pulse width time (ON time): Triac; Fixed at 100 msec
  - Open collector: 50 μ sec to 1 sec (On the basis of 1 μ sec)
  - Input low-level cut: Specifying of low cut value by %.
  - Output low-level cut: Specifying of low cut frequency (7 digits).
- **Accuracy:** See the accuracy table.
**Model Number Table**

<table>
<thead>
<tr>
<th>Basic model number</th>
<th>Selections</th>
<th>Additions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J-SAP90</td>
<td>I</td>
<td></td>
<td>Integrator Module</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
<td>No varnish coated</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>Varnish coated</td>
</tr>
<tr>
<td>-1</td>
<td></td>
<td></td>
<td>Input: 1 to 5V DC</td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td></td>
<td>Input: 4 to 20 mA DC</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>Output: Non-contact output</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>Output: Open collector</td>
</tr>
<tr>
<td>-0</td>
<td></td>
<td></td>
<td>Without test report</td>
</tr>
<tr>
<td>-1</td>
<td></td>
<td></td>
<td>With test report</td>
</tr>
</tbody>
</table>

Example: J-SAP90X-12-0

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**Figure 1. Functional block diagram of integrator module**
When ordering, please specify:
1) Tag number
2) Maximum output frequency* [Set to 0 to 1 Hz by default]

The following are also set by default:
 a) Input linearization setting: Linear
 b) Output low cut: Unavailable
 c) Pulse width type: 50% duty

* 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>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>0 to 0.0278 Hz (0 to 100 C/H)</td>
</tr>
<tr>
<td>02</td>
<td>0 to 0.2778 Hz (0 to 1000 C/H)</td>
</tr>
<tr>
<td>03</td>
<td>0 to 1 Hz</td>
</tr>
<tr>
<td>04</td>
<td>0 to 10 Hz</td>
</tr>
<tr>
<td>05</td>
<td>0 to 100 Hz</td>
</tr>
<tr>
<td>06</td>
<td>0 to 1 kHz</td>
</tr>
<tr>
<td>07</td>
<td>0 to 5 kHz</td>
</tr>
</tbody>
</table>

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

Panel-cutout

DIN rail mounting

Wall-mounting

DIN rail mounting

Wall-mounting (n: number of modules mounted)

2-M4 screws (for number of modules)

2-M4 screws

L-type mounting brackets (2, top and bottom) (standard accessory)

Single mounting

Multi-mounting (n: number of modules mounted)

6.5

8.6

15.7

12.8

11.5

11.5

17.5 mm

2-M4 screws

(standard accessory)

2-M4 screws

(standard accessory)

Figure 3. Mounting method

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