azbil Specification

SystempaK (Digital/File Type)
Single Input Arithmetic Relay Module
Model J-SCM 90/95

Introduction

The Single Input Arithmetic Module is an advanced arithmetic module that can combine multiple arithmetic operation functions and execute them.

After A/D conversion, the Single Input Arithmetic Module performs input processing, such as filtering and low cut processing to a single point of input (4 to 20 mA/1 to 5V DC). A signal completed with input processing is then processed with arithmetic operations via the arithmetic equations assigned to a maximum of four processing combo boxes. After output low cut processing, the final output is D/A-converted to 4 to 20 mA/ 1 to 5V DC.

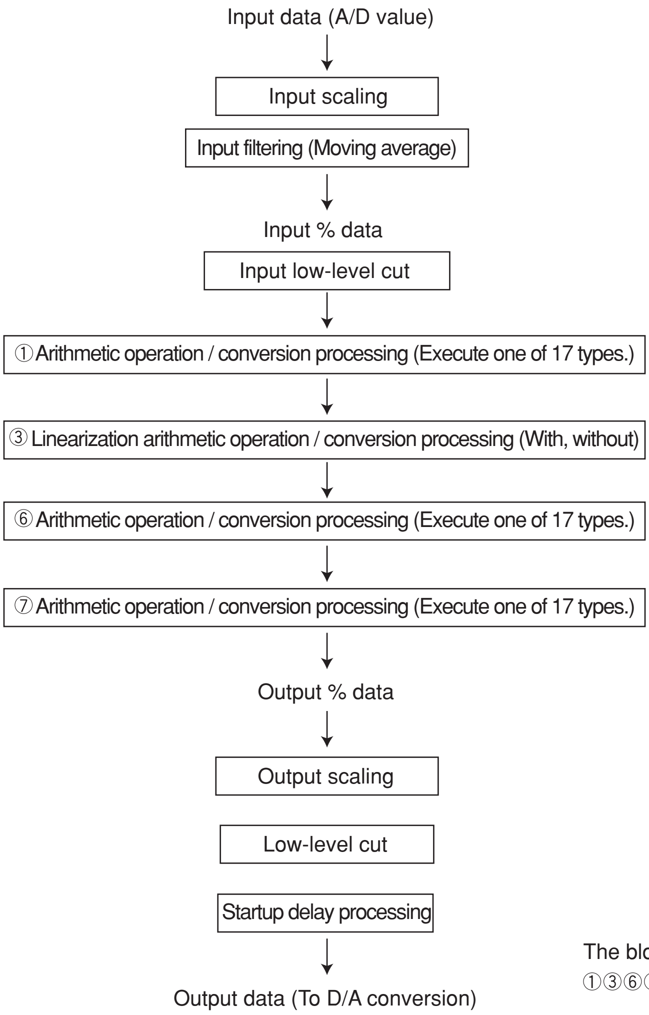
By selecting one from 18 kinds of arithmetic equations provided as standard equations, an arithmetic function can be easily set on each processing combo box. A variety of arithmetic functions and input/output processing parameter settings can be implemented using the dedicated Loader Software, which operates on a general-purpose PC.

The Single Input Arithmetic Module provides the one-output model of J-SCM90 and the two-output model of J-SCM95. In the two-output model, isolation is employed between the two output circuits.

Specification

- Input signal: 1 to 5V DC or 4 to 20 mA DC
- Input impedance: 1 MΩ (voltage input), 50 Ω (current)
- Output signal:
  No. 1 output; 1 to 5V DC or 4 to 20 mA DC
  No. 2 output; 1 to 5V DC
  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 600 Ω (Current output: Up to +110%)
- Input/output response:
  Minimum of 160 msec, 0 to 90% response (Moving average and first-order lag filtering are not provided.)
- Output hardware filtering: 50 msec, 0 to 90% response
- Accuracy: 0.15%FS (Excluding arithmetic errors)
- Output update period: 5 msec
  (Output hardware filtering, 0 to 90% response, 50 msec)
- 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 $^{+10}_{-15}$ %
- Current consumption: 130 mA or less (at 24V DC)
- Ambient temperature:
- Normal operating condition: 5 to 45℃
- Operation limit: 0 to 50℃
- 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 $^{+10}_{-15}$ %
  Temperature effect; ±0.15%FS/10℃
- 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)
  Input filtering; Unavailable/available (Moving average)
  Input low-level cut; Setting of input low-level cut value by %.
  Output low-level cut; Setting of output low-level cut value by %.
  Output zero span adjustment; Settable to any value within the output range (-20 to +120%FS)
  Startup delay; Setting of delay time before starting arithmetic actions during power-on startup (0 to 99 seconds)
  Function setting; Setting of arithmetic functions on processing combo boxes

Block diagram of arithmetic unit processing



The blocks enclosed in boxes are the setting items.
①③⑥⑦ are the processing combo box numbers.

Description of signal conversion/arithmetic operations

Conversion / operator	Function outline	Processing combo box used	Settings
No processing	No signal conversion / arithmetic operation	①, ②, ⑥, ⑦	--
Free-spec linearizer	Sets the output % data for each input % (maximum of 101 points). Or, for the following application cases, tables can be easily created by selecting types and then setting equations and coefficients using the dedicated Loader: Orifice, venturi: ($\sqrt{}$Input signal) Partial flume: (Input signal)^{a} Triangular notch weir: (Input signal)$^{5/2}$ Rectangular notch weir, Broad-Crested weir: (Input signal)$^{3/2}$	②	±120.00% range
Ratio / bias setting	Arithmetic equation: Select one from the following. Output = Ratio × Input + Bias Output = Ratio × (Input + Bias)	①, ⑥, ⑦	Ratio: -10.000 to 10.000 Bias: -999.99 to 999.99
First-order lag filtering	Provides a first-order lag response.	①, ⑥, ⑦	0 to 999.9 seconds (63% response)
Output ramping	Provides a response with certain amount of changes. Setting of response time 0 to 100% of output range	①, ⑥, ⑦	Gradient response time: 0.5 to 40.0 sec UP direction, DOWN direction. Time is set individually.
Square root	Input square root extraction	①, ⑥, ⑦	With, without Input/output low-level cut point: 0.00 to 100.00
Reverse function	Reverses an input % value for output.	①, ⑥, ⑦	With, without
Maximum value hold	When the hold terminal is shorted: Holds and outputs a maximum input % value. When open: Outputs an input value without holding it.	①, ⑥, ⑦	With, without
Minimum value hold	When the hold terminal is shorted: Holds and outputs a minimum input % value. When open: Outputs an input value without holding it.	①, ⑥, ⑦	With, without
Peak-peak hold	When the hold terminal is shorted: Outputs the range between maximum and minimum. When open: Outputs an input value without holding it.	①, ⑥, ⑦	With, without
Low monitor	One-point low monitoring switch Results can be used as DO to the next processing combo box. (No outputs to terminals)	①, ⑥, ⑦	Monitoring setpoint: -999.99 to 999.99% Differential: 0.00 to 999.99%
High monitor	One-point high monitoring switch Results can be used as DO to the next processing combo box. (No outputs to terminals)	①, ⑥, ⑦	Monitoring setpoint: -999.99 to 999.99% Differential: 0.00 to 999.99%
Deviation monitor	Switch for monitoring deviations from setting values Results can be used as DO to the next processing combo box. (No outputs to terminals)	①, ⑥, ⑦	Monitoring setpoint: -999.99 to 999.99% Differential: 0.00 to 999.99%
Rate-of-change monitor	Switch for monitoring the one-point rate of change Results can be used as DO to the next processing combo box. (No outputs to terminals)	①, ⑥, ⑦	Rate of change Hi: 0.0 to 999.9%/second Rate of change Lo: 0.0 to 999.9%/second
Scaling	Converts an input value scale.	①, ②, ⑥, ⑦	Scale low: -999.99 to 999.99 No indication of unit Scale high: -999.99 to 999.99 No indication of unit
High/low limitter	Limits the high/low of an input value.	①, ⑥, ⑦	Low limit setpoint: -999.99 to 999.99% High limit setpoint: -999.99 to 999.99%
Rate-of-change limitter	Limits the rate of change of an input value.	①, ⑥, ⑦	Rate of change Up: 0.00 to 999.99%/second Rate of change Down: 0.00 to 999.99%/second
Preset value	When the DI input (DO from previous arithmetic operation) is ON: Outputs a specified preset value. When OFF: Outputs an input value without any presetting.	①, ⑥, ⑦	Pre-set value (-999.99 to 999.99%)
Preset with ramping	When the DI input (DO from previous arithmetic operation) is ON: Outputs a specified preset value. (Change function at certain gradients available) When OFF: Outputs an input value without any presetting.	①, ⑥, ⑦	Pre-set value (-999.99 to 999.99%) Gradient (0.01 to 999.99%/second)

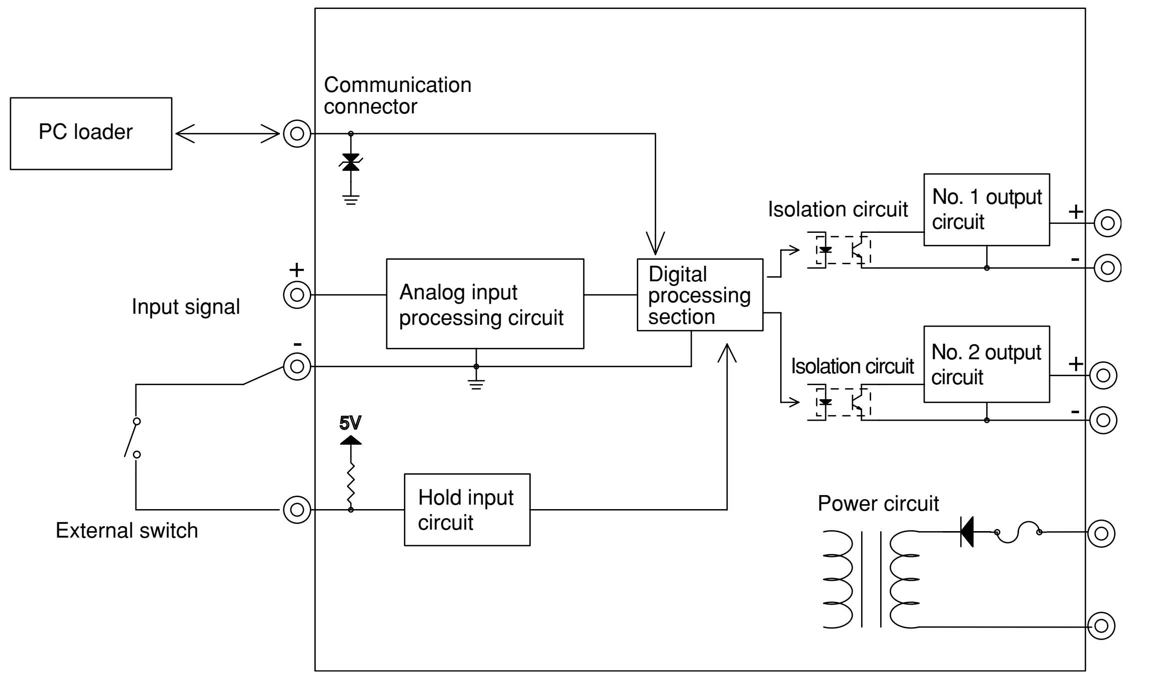


Figure 1. Functional configuration diagram of single input arithmetic unit

Model Number Table

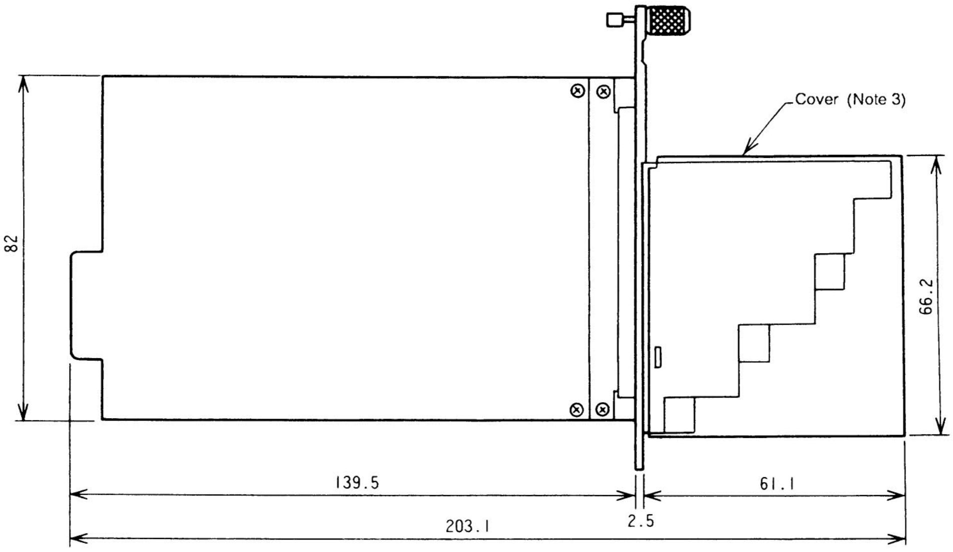
One-output model

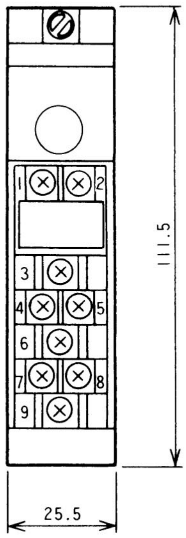
Basic Model Number		Selections I	Selections II	Additions I	Description
J-SCM90					Arithmetic Relay Module (One-output model)
	X				No varnish coated
	C				Varnish coated
		-1			Input: 1 to 5V DC
		-2			Input: 4 to 20 mA DC
			1		Output: 1 to 5V DC
			2		Output: 4 to 20 mA DC
				-0	Without test report
				-1	With test report

Two-output model

Basic Model Number		Selections I	Selections II	Additions I	Description
J-SCM95					Arithmetic Relay Module (Two-output model)
	X				No varnish coated
	C				Varnish coated
		-1			Input: 1 to 5V DC
		-2			Input: 4 to 20 mA DC
			1		No. 1 output: 1 to 5V DC, No. 2 output: 1 to 5V DC
			2		No. 1 output: 4 to 20 mA DC, No. 2 output: 1 to 5V DC
				-0	Without test report
				-1	With test report

Example: J-SCM90X-11-0





No.	Description
1 (Note 1)	–––
2 (Note 1)	Input (–)
3	Input (+)
4	No. 1 Output (+)
5	No. 1 Output (–)
6	No. 2 Output (+) (Note 2)
7	No. 2 Output (–) (Note 2)
8	–––
9	GND

Note 1) For arithmetic operations set with HOLD functions, establish a short between terminal No. 1 and 2.
2) For two-output mode.
3) Operate the Module with a cover.
4) Terminal screws: M3.5
5) Use the pressured terminals with insulation sheath.

Figure 2. Dimensions and wiring diagram

MEMO

MEMO

When ordering, please specify:
• Tag number

The ratio / bias function (Ratio: 1, Bias: 0%) is configured as an arithmetic function by default at the time of delivery.
Input filtering is set to "Moving average available" by default.

Please read the "Terms and Conditions" from the following URL before ordering or use:

http://www.azbil.com/products/bi/order.html

Specifications are subject to change without notice.

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