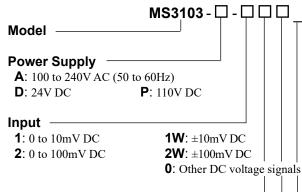
Model: MS3103

DESCRIPTION

The MS3103 is a terminal block type millivolt (mV) isolator that converts mV input signals from sensors or other devices into commonly used DC signals and provides an isolated dual output.

ORDERING CODE



Output 1

A: 4 to 20mA DC
D: 0 to 20mA DC
Z: Other DC current signals

2: 0 to 100mV DC 3: 0 to 1V DC 4: 0 to 10V DC 5: 0 to 5V DC 6: 1 to 5V DC

1: 0 to 10mV DC

3W: ±1V DC **4W**: ±10V DC **5W**: ±5V DC

0: Other DC voltage signals

Output 2

The codes are the same as for Output 1.

Note 1: When a voltage output is selected for Output 1, a current output cannot be selected for Output 2.

Note 2: When the code A (4 to 20mA) is selected for both of the two outputs, the output load will be 550Ω maximum for Output 1 and 350Ω maximum for Output 2.

Options

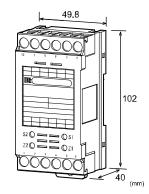
No code: None

/K: Fast response (0 to 90% response time: 10ms max.)

/H: Polyurethane conformal coating

/X: Others (Special order)

* For non-standard options, ask MTT for availability.





ORDERING INFORMATION

To place an order, please use the ordering code format as shown on the left.

(e.g.) MS3103-A-2A6

Other Ordering Examples:

For an input code of "0": MS3103-A-0AA (Input: 0 to 75mV) For an output code of "Z": MS3103-A-2Z6 (Output: 8 to 20mA)

For an option code of "X": MS3103-A-2A6/X (Response frequency: 50Hz)

Note: If you wish to include multiple options in your order, specify the option codes in series (e.g. /KX).

SPECIFICATIONS

POWER SECT	TON
Power	100 to 240V AC: 85 to 264V AC (47
Requirements	to 63Hz)
	24V DC: 24V DC±10%
	110V DC: 90 to 121V DC
Power Sensitivity	Better than $\pm 0.1\%$ of span for each
	power supply range.
Power Line Fuse	160mA fuse
Maximum Power C	onsumption
Power 100	0-240V AC 24V DC 110V DC

Approx.

1.6W

Approx.

6.5VA

OINPUT SECTION

Input Resistance	With or without power: $1M\Omega$ min.
Allowable Input	30V DC max., continuous.
Voltage	
Range Available	
Input Range (DC)	-200mV to 200mV
Input Span (DC)	5mV* to 400mV
Input Bias	-100 to 100%
Note: For any input range including negative input signals,	

Note: For any input range including negative input signals, the input span ranges from *10mV to 400mV.

Input Spec Ex. 1: For 50 to 150mV input, the input span is 100mV and the bias +50%.

Input Spec Ex. 2: For -10 to 30mV input, the input span is

40mV and the bias -25%.

Approx.

2.5W



OUTPUT SECTION

OUTPUT SECT	ION	
Allowable Output Lo	oad	
Voltage Output	1V span and up	2mA max.
(DC)	10mV	10 k Ω min.
	100mV	100 k Ω min.
Current Output	4-20mA single output	750Ω max.
(DC)	4-20mA dual output	Output 1:
		550Ω max.
		Output 2:
		350Ω max.
Zero Adjustment	Approx. ±5% of span	•
	(Adjustable by the fro	nt-accessible
	trimmer.)	
Span Adjustment	Approx. ±5% of span	
	(Adjustable by the fro	nt-accessible
	trimmer.)	
Ranges Available		
	Current Signal	Voltage Signal
Output Range (DC)	0 to 20mA	-10 to 10V
Output Span (DC)	4 to 20mA	10mV to 20V
Output Bias	0 to 100%	-100 to 100%
* For current output signals, the accuracy of any current		
output smaller than	0.1mA is not guarantee	d.
Output Spec Ex. 1: Fo	or 4 to 20mA output, the	output span is
16:	mA and the bias $+25%$.	
Output Spec Ex. 2: For -1 to 4V output, the output span is		
Output Spec Ex. 2: Fo	or -1 to 4 v output, the o	utput span is

PERFORMANCE

Accuracy RatingBetter than $\pm 0.1\%$ of span (at $25^{\circ}\text{C}\pm5^{\circ}\text{C}$).TemperatureBetter than $\pm 0.2\%$ of span per 10°C Effectchange in ambient.Response Time 160ms max. (0 to 90%) with a step input at 100% .CMRR 100dB min. (500V AC , $50/60\text{Hz}$)Isolation 4-way isolation between input, output 1, output 2, and power.Insulation $100\text{M}\Omega$ min. (@ 500V DC) between input, output 1, output 2, power, and ground.Dielectric StrengthInput / [Output 1, Output 2] / [Power, Ground]: 2000V AC for 1 minute (Cutoff current: 0.5mA)Power / Ground: 2000V AC for 1 minute (Cutoff current: 500V AC for 1 minute (Cutoff current: 500V AC for 1 minute (Cutoff current: 0.5mA)Surge WithstandTested as per ANSI/IEEECapabilityC37.90.1-1989.OperatingAmbient temperature: -5 to 55°C EnvironmentHumidity: 5 to 90% RH (non-condensing)Storage -10 to 60°C	TI LIN ONWAND	<i>,</i> L
Temperature Effect change in ambient. Response Time 160ms max. (0 to 90%) with a step input at 100%. CMRR 100dB min. (500V AC, 50/60Hz) Isolation 4-way isolation between input, output 1, output 2, and power. Insulation 100MΩ min. (@ 500V DC) between input, output 1, output 2, power, and ground. Dielectric Strength Input / [Output 1, Output 2] / [Power, Ground]: 2000V AC for 1 minute (Cutoff current: 0.5mA) Power / Ground: 2000V AC for 1 minute (Cutoff current: 5mA) Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA) Surge Withstand Capability C37.90.1-1989. Operating Ambient temperature: -5 to 55°C Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C	Accuracy Rating	
Effect Change in ambient.		25°C±5°C).
Response Time 160ms max. (0 to 90%) with a step input at 100%.	Temperature	Better than $\pm 0.2\%$ of span per 10° C
input at 100%. CMRR 100dB min. (500V AC, 50/60Hz) Isolation 4-way isolation between input, output 1, output 2, and power. Insulation 100MΩ min. (@ 500V DC) between input, output 1, output 2, power, and ground. Dielectric Strength Input / [Output 1, Output 2] / [Power, Ground]: 2000V AC for 1 minute (Cutoff current: 0.5mA) Power / Ground: 2000V AC for 1 minute (Cutoff current: 5mA) Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA) Surge Withstand Tested as per ANSI/IEEE Capability C37.90.1-1989. Operating Ambient temperature: -5 to 55°C Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C	Effect	change in ambient.
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Response Time	` , , <u>.</u>
Solation 4-way isolation between input, output 1, output 2, and power.		input at 100%.
$\begin{array}{c} \text{output 1, output 2, and power.} \\ \\ \text{Insulation} \\ \text{Resistance} \\ \\ \text{Dielectric Strength} \\ \\ \text{Dielectric Strength} \\ \\ \text{Input / [Output 1, output 2] / [Power, Ground]: 2000V AC for 1 minute (Cutoff current: 0.5mA)} \\ \\ \text{Power / Ground: 2000V AC for 1} \\ \\ \text{minute (Cutoff current: 5mA)} \\ \text{Output 1 / Output 2: 500V AC for 1} \\ \\ \text{minute (Cutoff current: 0.5mA)} \\ \\ \text{Surge Withstand} \\ \text{Capability} \\ \text{Capability} \\ \text{Capability} \\ \text{Capability} \\ \text{Chapability} \\ Chapabili$	CMRR	100dB min. (500V AC, 50/60Hz)
$\begin{array}{c} \mbox{Insulation} & 100 M\Omega \mbox{ min. } (@\ 500 V\ DC) \mbox{ between} \\ \mbox{Resistance} & \mbox{input, output 1, output 2, power, and} \\ \mbox{ground.} \\ \mbox{Dielectric Strength} & \mbox{Input / [Output 1, Output 2] / [Power, Ground]: 2000 V\ AC \mbox{ for 1 minute}} \\ \mbox{ (Cutoff current: 0.5mA)} \\ \mbox{Power / Ground: 2000 V\ AC \mbox{ for 1 minute}} \\ \mbox{ (Cutoff current: 5mA)} \\ \mbox{Output 1 / Output 2: 500 V\ AC \mbox{ for 1 minute}} \\ \mbox{ (Cutoff current: 0.5mA)} \\ \mbox{Surge Withstand} & \mbox{ Tested as per ANSI/IEEE} \\ \mbox{ Capability} & \mbox{ C37.90.1-1989.} \\ \mbox{Operating} & \mbox{ Ambient temperature: -5 to 55°C} \\ \mbox{ Environment} & \mbox{ Humidity: 5 to 90% RH} \\ \mbox{ (non-condensing)} \\ \mbox{Storage} & \mbox{ -10 to 60°C} \\ \mbox{ -10 to 60°C} \\ \mbox{ -10 to 60°C} \\ \mbox{ -10 to 60°C} \\ \mbox$	Isolation	4-way isolation between input,
Resistance input, output 1, output 2, power, and ground. Dielectric Strength Input / [Output 1, Output 2] / [Power, Ground]: 2000V AC for 1 minute (Cutoff current: 0.5mA) Power / Ground: 2000V AC for 1 minute (Cutoff current: 5mA) Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA) Surge Withstand Capability C37.90.1-1989. Operating Ambient temperature: -5 to 55°C Environment Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C		output 1, output 2, and power.
ground. Dielectric Strength Input / [Output 1, Output 2] / [Power, Ground]: 2000V AC for 1 minute (Cutoff current: 0.5mA) Power / Ground: 2000V AC for 1 minute (Cutoff current: 5mA) Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA) Surge Withstand Capability C37.90.1-1989. Operating Ambient temperature: -5 to 55°C Environment Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C	Insulation	100MΩ min. (@ 500V DC) between
Dielectric Strength Input / [Output 1, Output 2] / [Power, Ground]: 2000V AC for 1 minute (Cutoff current: 0.5mA) Power / Ground: 2000V AC for 1 minute (Cutoff current: 5mA) Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 5mA) Surge Withstand Capability	Resistance	input, output 1, output 2, power, and
Ground]: 2000V AC for 1 minute (Cutoff current: 0.5mA) Power / Ground: 2000V AC for 1 minute (Cutoff current: 5mA) Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA) Surge Withstand Capability Tested as per ANSI/IEEE C37.90.1-1989. Operating Ambient temperature: -5 to 55°C Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C		ground.
(Cutoff current: 0.5mA) Power / Ground: 2000V AC for 1 minute (Cutoff current: 5mA) Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA) Surge Withstand Capability C37.90.1-1989. Operating Environment Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C	Dielectric Strength	Input / [Output 1, Output 2] / [Power,
Power / Ground: 2000V AC for 1 minute (Cutoff current: 5mA) Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA) Surge Withstand Capability C37.90.1-1989. Operating Environment Humidity: 5 to 90% RH (non-condensing) Storage Power / Ground: 2000V AC for 1 minute (Cutoff current: 0.5mA) Tested as per ANSI/IEEE C37.90.1-1989. Humidity: 5 to 90% RH (non-condensing)		Ground]: 2000V AC for 1 minute
minute (Cutoff current: 5mA) Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA) Surge Withstand Capability C37.90.1-1989. Operating Environment Humidity: 5 to 90% RH (non-condensing) Storage minute (Cutoff current: 5mA) Tested as per ANSI/IEEE C37.90.1-1989. Humidity: 5 to 55°C Humidity: 5 to 90% RH (non-condensing)		(Cutoff current: 0.5mA)
Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA) Surge Withstand Capability C37.90.1-1989. Operating Ambient temperature: -5 to 55°C Environment Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C		
minute (Cutoff current: 0.5mA) Surge Withstand Capability C37.90.1-1989. Operating Ambient temperature: -5 to 55°C Environment (non-condensing) Storage -10 to 60°C		minute (Cutoff current: 5mA)
Surge Withstand Capability C37.90.1-1989. Operating Environment Capability C37.90.1-1989. Operating C37.90.1-1989. Ambient temperature: -5 to 55°C Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C		Output 1 / Output 2: 500V AC for 1
Capability C37.90.1-1989. Operating Ambient temperature: -5 to 55°C Environment Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C		minute (Cutoff current: 0.5mA)
Operating Ambient temperature: -5 to 55°C Environment Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C	Surge Withstand	Tested as per ANSI/IEEE
Environment Humidity: 5 to 90% RH (non-condensing) Storage -10 to 60°C	Capability	C37.90.1-1989.
(non-condensing) Storage -10 to 60°C	Operating	Ambient temperature: -5 to 55°C
Storage -10 to 60°C	Environment	Humidity: 5 to 90% RH
3		(non-condensing)
Temperature	Storage	-10 to 60°C
	Temperature	

PHYSICAL

Installation	DIN rail mounting
Wiring	M3.5 screw terminal connection
	(with drop-proof screws)
Screwing Torque	0.8 to 1.0 [Nm] * Recommended
External	W49.8 × H102.0 × D40.0 mm
Dimensions	(including DIN rail)
Weight	140g max.
• MATERIAL	

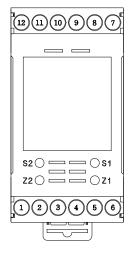
• MATERIAL

Housing	ABS resin (UL 94V-0)
Screw Terminal	Nickel-plated steel
Printed Circuit	Glass fabric, epoxy resin
Board	(FR-4: UL 94V-0)

OSTANDARDS CONFORMITY

EC Directive	EMC Directive (2014/30/EU)
Conformity	EN61326-1:2013
	Low Voltage Directive (2014/35/EU)
	IEC61010-1
	EN61010-1:2010/A1:2019
	Installation Category II
	Pollution Degree 2
	Maximum operating voltage 300V
	Reinforced insulation between
	[input/output/GND] and power.

TERMINAL ASSIGNMENTS



\bigcirc	+ OUTPUT 2
2	- OUTPUT 2
3	N.C.
4	P (+) POWER
(5)	N (-)
6	GND
7	+ INPUT
8	- INPUT
9	N.C.
9	N.C.
11)	+ OUTPUT 1
12	- OUTPUT 1

BLOCK DIAGRAM

