MITSUBISHI POWER

LSAIM04-1-R   AI module

LS communication   Thermocouple inputs : 7   -20 to 80 mV

■Summary
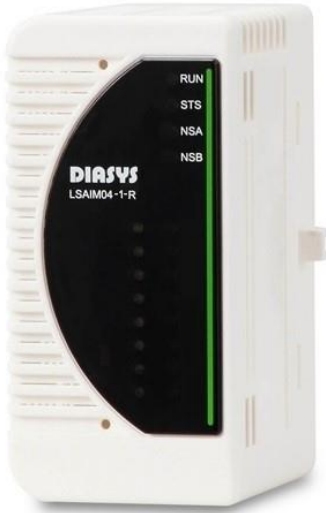
＊Number of inputs	:	7 /Thermocouple input
		(+1 /Cold junction compensation input , Channel individual isolation)
＊Input range	:	-20 to 80 mV
＊Module ambient temperature	:	0 to 55℃
＊Insulation method	:	Photocoupler insulation
＊Supported FXtoLS adapter	:	LSRLTS-AI01, LSRLTS-AI04

This module is dedicated to compact retrofit terminal blocks.
Dedicated lock pins are attached to the bottom.

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■Specifications

ITEM			SPECIFICATION	
Input	Number of channels		7 points　+1 point cold junction compensation (channel individual isolation)	
	Resolution		16 bits	
	Burnout Upscale/Downscale		Switchable by EMS setting	
	Range *[1]		−20 to 80 mV (Full Scale)	
		TC	T: −200 to 400°C	,　−5.603 to 20.872 mV
			J: −200 to 1200°C	,　−7.890 to 69.553 mV
			E: −200 to 1000°C	,　−8.825 to 76.373 mV
			R: −50 to 1768°C	,　−0.226 to 21.101 mV
			K: −200 to 1372°C	,　−5.891 to 54.886 mV
		RTD	PT100: −10 to 100℃	,　96.09 to 138.51 Ω (Full Scale)
Absolute accuracy @25℃	mV	−	±0.1%FS (mV input)	
	TC	Type−T	±4℃ (<−150℃), ±1℃ (−150℃〜400℃)	
		Type−J	±4℃ (<−150℃), ±1℃ (−150℃〜1200℃)	
		Type−E	±4℃ (<−150℃), ±1℃ (−150℃〜1000℃)	
		Type−R	±4℃ (<0℃), ±3℃ (0℃〜200℃), ±2℃ (>200℃)	
		Type−K	±4℃ (<−150℃), ±1℃ (−150℃〜1372℃)	
	RTD	Type−PT100	±0.1℃	
Temperature drift @−5℃ to 60℃	TC		Less than ±100 ppm/°C (relative to full−scale)	
	RTD		Less than ±100 ppm/°C (relative to full−scale)	
CMRR	TC	Type−E	100 dB or more attenuation	
		Type−T	100 dB or more attenuation	
	RTD	When voltage	100 dB or more attenuation	
		When Current	100 dB or more attenuation	
NMRR	TC		20 dB or more attenuation	
	RTD		20 dB or more attenuation	
Data refresh cycle			50 ms /All channels	
Input filter			Software digital filter (Channel individual)	
Dielectric strength			AC 500 V input terminal − between PE　Between input channels	
Communication with IOA	Communicaton method		LVDS	
	Communication speed		100 Mbps	
Self−diagnostic functions			Power voltage check (24 V, 3.3 V, 2.5V, 1.8V, 1.0 V) Clock check (FPGA−MCU for diagnosis, MCU for diagnosis −FPGA) Heartbeat check (FPGA−MCU for diagnosis, MCU for diagnosis −FPGA) CRC check (FPGA) AI communication error check	
Detective			ADC abnormal check I/O signal range check (Overrange, Underrange) *[1]	
Operation at disconnection			1 to 7 ch (For upscale burnout setting) Detect overrange 1 to 7 ch (For downscale burnout setting) Detect underrange 8 ch Simultaneous detection of underrange and overrange	
Protection	(Power supply protection)		Overvoltage protection Overcurrent protection	
Indicator	Display LED		4: RUN (Run) / STS (Status) / NSA (Network status A) / NSB (Network status B)	
Insulation method			Photocoupler insulation	
Hot swap			Possible	
Power supply			DC 24 V ±20% (The voltage supplied from the backplane)	
Environmental conditions	Module ambient temperature		(Operating) 0 to 55°C (Storage) −40 to 85°C	
	Module ambient humidity		(Operating / Storage) Less than 95% RH (No condensation)	
Vibration			3.5 mm @5 to 8.4 Hz 1 G @8.4 to 150 Hz	
Shock			15 G 11 ms	
Current consumption			Less than 82 mA	
Weight			0.12 kg	
Dimensions			62 mm (D) x 94 mm (H) x 46 mm (W) (Except projection)	
Standard/Directive			EN 61131−2:2007, RoHS	

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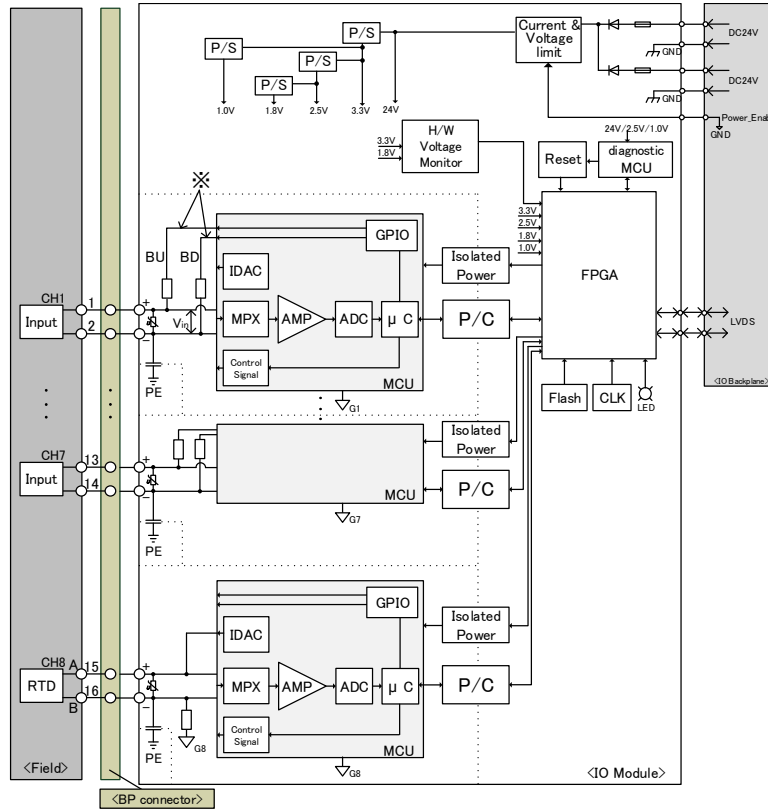Mitsubishi Power is a power solutions brand of Mitsubishi Heavy Industries.　　CGS−S5115−E−00 (2024. 10. 31)

*[1] Input Overrange / Input Underrange are detected under the following conditions.
　・Type-E: Less than -270℃ (-9.835mV) / More than 1000℃ (36.373mV)
　・Type-J: Less than -210℃ (-8.095mV) / More than 1200℃ (69.553mV)
　・Type-K: Less than -270℃ (-6.458mV) / More than 1370℃ (54.819mV)
　・Type-R: Less than -50℃ (-0.226mV) / More than 1760℃ (21.003mV)
　・Type-T: Less than -270℃ (-6.258mV) / More than 400℃ (20.872mV)
　・Pt100 : Less than -12.77℃ (95.000Ω) / More than 103.072℃ (139.670Ω)

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■Block diagram

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
The setting of burnout direction ,upscale / downscale, is determined by which side of + side / - side is made High.

・Normal time: The electromotive force of the compensation conductor is input to the MCU at Vin (+/- line voltage)

・At the time of disconnection (upscale burnout setting): the potential of the + side wiring rises ⇒
  The value of Vin (the difference between the + side and the - side) becomes too large.
  (The ADC input sticks to the upper limit) ⇒ Overrange

・At the time of disconnection (downscale burnout setting): the potential of the - side wiring rises ⇒
  The value of Vin (the difference between the + side and the - side) becomes too small.
  (The ADC input sticks to the lower limit) ⇒ Underrange

P/S	:	Power supply
IDAC	:	Iout Digital analog converter
MPX	:	Multiplexer
AMP	:	Amplifier
ADC	:	Analog digital converter
μC	:	Micro controller
CLK	:	Clock
FPGA	:	Field programmable gate array
LED	:	Light emitting diode
MCU	:	Micro control unit
GND,G1	:	Ground
IOA	:	I/O adapter
LVDS	:	Low Voltage Differential Signaling
BP	:	Backplane
PE	:	Protective Earth
P/C	:	Photocoupler
⌇	:	Varistor
▭	:	Resistor
▭	:	Fuse
◁|	:	Diode
⊣⊢	:	Capacitor

When using, please read the instruction manual attached to the product carefully and use it properly.
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