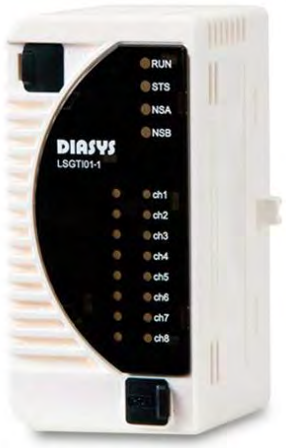
MITSUBISHI POWER

LSGTI01-1 Gas turbine interlock module

LS communication Gas turbine interlock function

■Summary



＊Terminal block input / output unit

- ・Distribution type input : 1
- ・Isolation type input : 1
- ・RTD input : 1
- ・Temperature input : 2
  - Blade path temperature
  - Exhaust gas temperature
- ・Gas turbine interlock output : 4

＊USB connector : 1 (For maintenance communication mini-B)

＊Module operating ambient temperature range : -5 to 60℃

■Overview Specifications

ITEM	SPECIFICATION
Distribution type input	1, 4 to 20 mA / DC 24 V
Isolation type input	1, 4 to 20 mA
RTD input	92.16 to 127.08 Ω (Equivalent to -20℃ to 70℃) × 1
Blade path temperature input	-5 to 75 mV × 1
Exhaust gas temperature input	-5 to 75 mV × 1
Gas turbine interlock output	Open collector output × 4, Maximum voltage DC 30 V, Maximum load current 0.1 A
Self-diagnostic functions	Power voltage check, Clock check, Heartbeat check, CRC check, ADC communication error check, Analog signal range check
IDOL Implementation	Possible
Module Duplication	incompatible
Indicator	Display LED × 4: Run / Status / Network status A / Network status B Channel State LED × 16: Ch 1 to Ch 16 Arbitrarily set by internal logic
USB connector	For maintenance communication mini-B × 1
Dielectric strength	AC 1500 V Digital input / output terminal - PE Between AC 1000 V Analog input / output terminal - PE Between
Environmental conditions	Ambient temperature (Operating / Storage) -5 to 60°C Ambient humidity (Operating / Storage) 0 to 95% RH (No condensation)
Operating power supply	DC 24 V ±20% Dual power reception (The voltage supplied from the backplane)
Shock / Vibration	15 G 11 ms / 3.5 mm @5 to 8.4 Hz, 1 G @8.4 to 150 Hz
Dimensions	62 mm (D) x 94 mm (H) x 46 mm (W) (Except projection)

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■Details Specifications

ITEM				SPECIFICATION
Terminal block Input/output section	Ch 1: Distribution type input	Number of channels		1
		Insulation method		Transformer insulation (Channel individual isolation)
		Dielectric strength		AC 1000 V Analog input terminal - PE Between
		Output voltage		15 to 30 V (4 to 20 mA)
	When used as a transmitter input	Input current range		4 to 20 mA (full scale)
		Absolute precision	@25°C	±0.15% FS (±0.024 mA)
		Temperature drift	@-5 to 60°C	±100 ppm/°C (Against full scale)
	Ch 2: Isolation type input	Number of channels		1
		Insulation method		Digital Isolator Isolation (Channel Individual Isolation)
		Dielectric strength		AC 1000 V Analog input terminal - PE Between
		Input current range		4 to 20 mA (full scale)
		Signal input resistance		300 Ω or less
		Absolute precision	@25°C	±0.1% FS (±0.016 mA)
		Temperature drift	@-5 to 60°C	±100 ppm/°C (Against full scale)
	Ch 3: RTD input (Cold junction compensation)	Number of channels		1
		Insulation method		Photocoupler insulation (channel individual isolation)
		Dielectric strength		AC 1000 V Analog input terminal - PE Between
		Input resistance range		92.16 to 127.08 Ω (Equivalent to -20 to 70℃)
		Absolute precision	@25°C	±0.1% FS (full scale: 64.83 to 146.8 Ω)
		Temperature drift	@-5 to 60°C	±100 ppm/°C (Against full scale)
	Ch 4, Ch 5: Blade path temperature input, Exhaust gas temperature input	Number of channels		2
		Insulation method		Photocoupler insulation (channel individual isolation)
		Dielectric strength		AC 1000 V Analog input terminal - PE Between
		Input voltage range		-5 to 75 mV
		Absolute precision	@25℃	±0.1% FS (full scale: -10 to 80 mV)
		Temperature drift	@-5 to 60°C	±100 ppm/°C (Against full scale)
	Ch 6, Ch 7, Ch 8, Ch 9: Interlock output	Number of channels		4
		Insulation method		Photocoupler insulation (channel individual isolation)
		Dielectric strength		AC 1500 V Digital output terminal - PE Between
		Maximum applied voltage		DC 30 V
		Contact breakdown current		100 mA
		Leakage current at OFF		0.1 mA or less
		Maximum residual voltage when ON		DC 1.2 V @100 mA
Operation cycle usable in DPS				10 msec or more
Communication specification between IOA		Communication method, Communication speed		LVDS, 100 Mbps
Self-diagnostic functions				Power voltage check (24 V, 17 V, 5 V, 3.3 V, 2.5 V, 1.8 V, 1.0 V, Other) *Refer to block diagram Clock check (FPGA-MCU, FPGA-CPU) Heartbeat check (FPGA-MCU, FPGA-CPU) CRC check (FPGA-MCU) ADC communication error check Analog signal range check (Overrange, Underrange)
IDOL Implementation				Possible (Shortest calculation cycle : 1ms) Supplement: IDOL is the logic description language used in DIASYS-UP, DIASYS-UP/V. The internal logic of this module is described in IDOL.
Module Duplication				Incompatible
Protective function (Backplane supply power protection)				Overvoltage protection, Overcurrent protection
Indicator		Display LED		4: RUN(Run) / STS(Status) / NSA(Network status A) / NSB(Network status B)
		Channel State LED		16: Ch 1 to Ch 16 Arbitrarily set by internal logic
Serial interface		For maintenance		1: USB Serial (USB mini-B connector)
Hot swap				Possible
Power supply				DC 24 V ±20% (The voltage supplied from the backplane)
Environmental conditions		Module ambient temperature		(Operating / Storage) -5 to 60°C
		Module ambient humidity		(Operating / Storage) 0 to 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
Rated Current				170 mA
Weight				0.13 kg
Dimensions				62 mm (D) x 94 mm (H) x 46 mm (W) (Except projection)
Standard/Directive				EN 61131-2:2007, RoHS

About compliant module type
For compliant modules of this product, please refer to " Compliant backplane list (CGS-S9901-E-XX) ".
For compliant modules of this product, please refer to " Compliant accessory connector list (CGS-S9902-E-XX) ".

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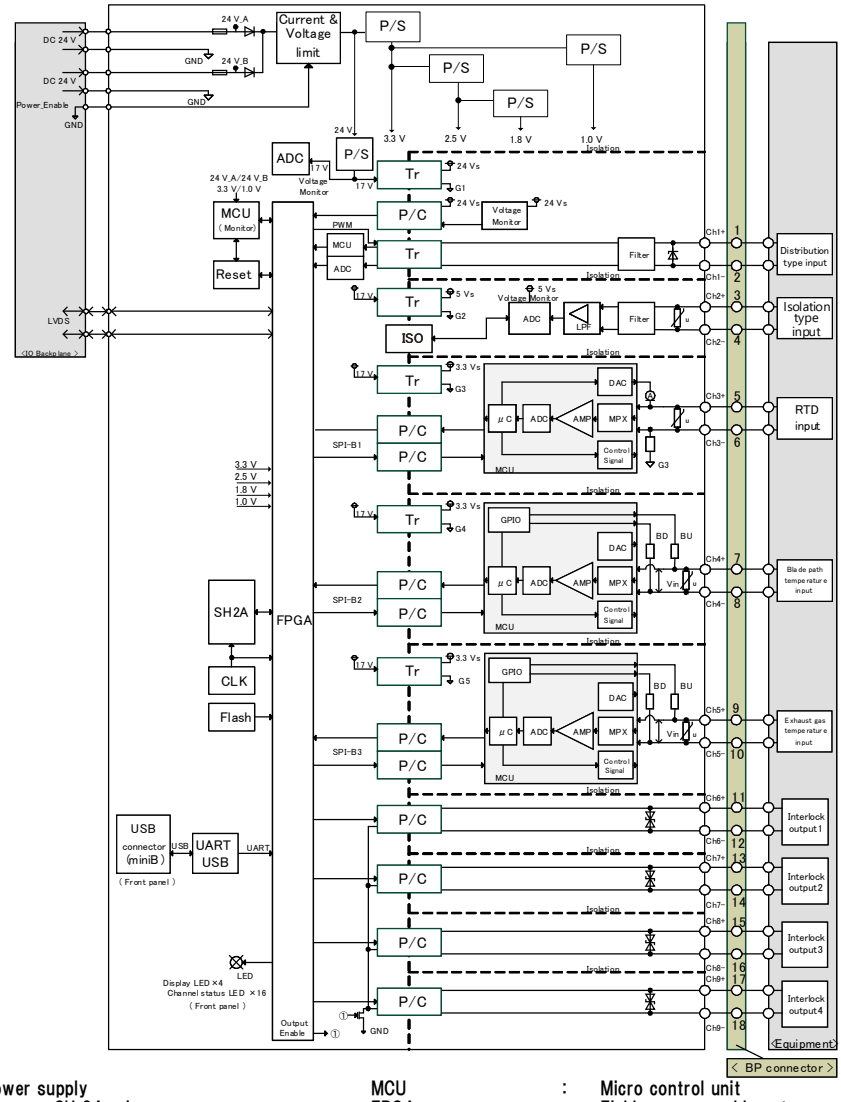
■Block diagram



P/S	:	Power supply	MCU	:	Micro control unit
SH2A	:	Renesas SH-2A micro processor	FPGA	:	Field programmable gate array
CLK	:	Clock generation circuit	LED	:	Light emitting diode
ISO	:	Digital isolator	ADC	:	Analog digital converter
LPF	:	Low pass filter	GND,G1,G2,G3,G4,G5	:	Ground
LVDS	:	Low Voltage Differential Signaling	BP	:	Backplane
PWM	:	Pulse width modulation	DAC	:	Digital analog converter
MPX	:	Multiplexer	μC	:	Micro controller
P/C	:	Photo Coupler	Tr	:	Transformer
AMP	:	Amplifier	Flash	:	Flash ROM
	:	Varistor		:	Resistor
	:	Fuse		:	Diode
	:	Zener diode		:	Bidirectional diode

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