LSTCL01 TCL module

LS communication   Turbine interlock logic control

■Summary

* Terminal block input / output unit

・52 G ON Digital input	: 1
・Auto stop low oil pressure input	: 1
・Turbine interlock output	: 3

MSV fully closed, GV fully closed, EV fully closed

・OPC electromagnetic valve output	: 1
・Lamp output	: 2
・DDC mode input	: 1
・OPC operation input	: 3
・External power supply 24 V	: 1

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

* Module operating ambient temperature range : -5 to 60°C

■Overview Specifications

ITEM	SPECIFICATION
52 G ON Digital input	DC 24 V × 1, Minimum ON current 2 mA
Auto stop low oil pressure input	DC 24 V × 1, Minimum ON current 2 mA
Turbine interlock output	Open collector output × 3, Maximum voltage DC 30 V, Maximum load resistance 50 mA
OPC electromagnetic valve output	Open collector output × 1, Maximum voltage DC 30 V, Maximum load resistance 50 mA
Lamp output	Open collector output × 2, Maximum voltage DC 30 V, Maximum load resistance 50 mA
DDC mode input	DC 24 V × 1, Minimum ON current 2 mA
OPC operation input	DC 24 V × 3, Minimum ON current 2 mA
External power supply 24 V	DC 24 V × 1
Self-diagnostic functions	Power voltage check, Clock abnormal check, Heartbeat check, CRC check, ADC communication error check
IDOL Implementation	IDOL Implementation
Module Duplication	Correspondence （LSIOB02)
Indicator	Display LED × 4: Run / Status / Network status A / Network status B General purpose display LED × 16: Ch 1 to Ch 16 Status display
USB connector	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	152.5 mm (D) x 94 mm (H) x 46 mm (W) (Except projection)

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■Details Specifications

ITEM			SPECIFICATION
Terminal block input / output unit	**Ch 1: 52 G ON Digital input**	Number of channels	1
		Insulation method	Photocoupler insulation
		Dielectric strength	AC 1500 V Digital input terminal – PE Between
		Current range — ON current	DC 2 mA or more Sense supply voltage:DC 24 V ±10%
		Current range — OFF current	DC 1 mA or less
	Ch 2: Auto stop low oil pressure input	Number of channels	1
		Insulation method	Photocoupler insulation
		Dielectric strength	AC 1500 V Digital input terminal – PE Between
		Current range — ON current	DC 2 mA or more Sense supply voltage:DC 24 V ±10%
		Current range — OFF current	DC 1 mA or less
	Ch 3+,Ch 3–,Ch 4+: Turbine interlock output	Number of channels	3 (Open collector)
		Insulation method	Photocoupler insulation
		Dielectric strength	AC 1500 V Digital output terminal – PE Between
		Maximum applied voltage	DC 30 V
		Contact withstand current	50 mA
		Leakage current at OFF	0.1 mA or less
		Maximum residual voltage when ON	DC 1.0 V @50 mA
		Each Ch function — Ch 3+	MSV full closure command
		Each Ch function — Ch 3–	GV full closure command
		Each Ch function — Ch 4+	EV full closure command
	Ch 4–: OPC electromagnetic valve output	Number of channels	1 Open collector
		Insulation method	Photocoupler insulation
		Dielectric strength	AC 1500 V Digital output terminal – PE Between
		Maximum applied voltage	DC 30 V
		Contact withstand current	50 mA
		Leakage current at OFF	0.1 mA or less
		Maximum residual voltage when ON	DC 1.0 V @50 mA
	Ch 5+, Ch 5–: Lamp output	Number of channels	2 (Open collector)
		Insulation method	Photocoupler insulation
		Dielectric strength	AC 1500 V Digital output terminal – PE Between
		Maximum applied voltage	DC 30 V
		Contact withstand current	50 mA
		Leakage current at OFF	0.1 mA or less
		Maximum residual voltage when ON	DC 1.0 V @50 mA
		Each Ch function — Ch 5+	All operation terminal automatic lamp output
		Each Ch function — Ch 5–	Manual lamp output
	Ch 7+: DDC mode input	Number of channels	1
		Insulation method	Photocoupler insulation
		Dielectric strength	AC 1500 V Digital input terminal – PE Between
		Current range — ON current	DC 2 mA or more Sense supply voltage:DC 24 V ±10%
		Current range — OFF current	DC 1 mA or less
	Ch 7–, Ch 8+, Ch 8–: OPC operation input	Number of channels	3
		Insulation method	Photocoupler insulation
		Dielectric strength	AC 1500 V Digital input terminal – PE Between
		Current range — ON current	DC 2 mA or more Sense supply voltage:DC 24 V ±10%
		Current range — OFF current	DC 1 mA or less
	Other Ch:	Dielectric strength	AC 1500 V External power input terminal – PE Between
		Ch 6+	External ground
		Ch 6–	External ground
		Ch 9+	External 24 V power supply plus
		Ch 9–	External ground

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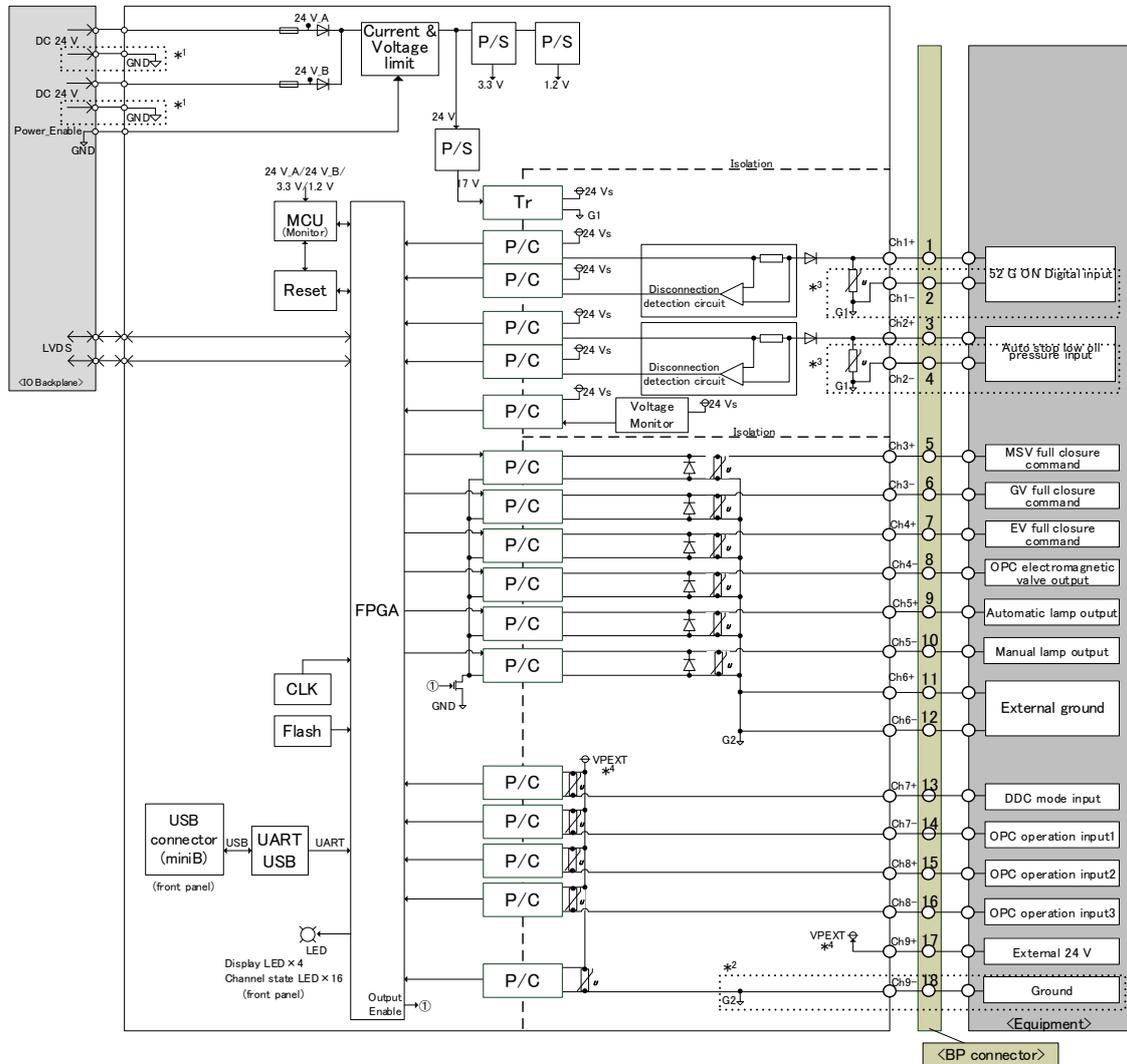| ITEM		SPECIFICATION
Calculation cycle usable in DPS		10 msec or more
Communication specification between IOA	Communication method , Communication speed	LVDS, 100 Mbps
Self-diagnostic functions		Power voltage check (24 V, 3.3 V, 1.2 V, Other) *Refer to block diagram Clock abnormal check (FPGA-MCU) Heartbeat check (FPGA-MCU) CRC check (FPGA-MCU) ADC communication error check Disconnection detection (Ch 1, Ch 2)
IDOL Implementation		no
Module Duplication		Correspondence (LSIOB02 is used for backplane)
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)
	General purpose display LED	16: Ch 1 to Ch 16 Status display
Serial interface	For maintenance	1: USB Serial (USB mini-B connector)
Hot swap		Possible
Operating power supply		DC 24 V ±20% Dual power reception (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		100 mA
Weight		0.18 kg
Dimensions		152.5 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

(Caution) Do not connect 24 V power supply ground($*^1$) for system side module operation to other ground (field side power supply 24 V ground($*^2$) or 52 G ON / hydraulic input ground($*^3$)).

$*^4$ For digital input, it is necessary to separately apply 24 V power from the outside.

P/S	:	Power supply
CLK	:	Clock generation circuit
ISO	:	Digital isolator
LPF	:	Low pass filter
LVDS	:	Low Voltage Differential Signaling
P/C	:	Photo Coupler
Flash	:	Flash ROM
	:	Varistor
	:	Fuse

MCU	:	Micro control unit
FPGA	:	Field programmable gate array
LED	:	Light emitting diode
ADC	:	Analog digital converter
GND,G1,G2	:	Ground
BP	:	Backplane
Tr	:	Transformer
	:	Resistor
	:	Diode

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