

LSSVL12D-1 Servo valve interface module

LS communication LVDT Servo valve interface

Summary



- * Terminal block input / output unit
 - Digital input : 2
 - Valve position demand output : 1
 - LVDT input / output : 1 (6/4/3 Line type)
- * Auxiliary output connector
 - Analog output : 3
- * Panel I/O connector
 - Connector dropout detection DI : 1
 - Digital input / output : 5 / 3
 - Analog input / Input and output : Input (Fixing) 3 / Input and output (variable) 3
Input and output (variable) Setting pattern:
In internal logic four types can be set
- * USB connector : 1 (For maintenance communication mini-B)

Overview Specifications

ITEM	SPECIFICATION
Digital input (52 G ON/ External forced closed input)	DC 24 V × 2, minimum ON Current 2 mA
Valve position demand output	±20 mA / ±60 mA × 1
LVDT input / output	6/4/3 Line type × 1, Output: 5 to 8 Vrms, Frequency: 800 to 8000 Hz, Input: 8 Vrms or less
Analog output (Auxiliary output connector)	1 to 5 V DC × 3
Digital input (Panel I/O)	DC 24 V × 5, Minimum ON current 2 mA Connector dropout detection DI × 1
Digital output (Panel I/O)	Open collector output × 3, Maximum voltage DC 30 V, Maximum load current 0.1 A
Analog input / Input and output (Panel I/O)	1 to 5 V DC × 3 / 1 to 5 V DC × 3 (Switchable input / output by the internal logic setting)
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
Self-diagnostic functions	Power voltage check, Clock check, Heartbeat check, CRC check
IDOL Implementation	Possible
Module Duplication	Supported (backplane uses LSI0B02 or LSI0B03) However, the signals of the auxiliary output connector and panel I/O connector are not duplicated
Dielectric strength	AC 1500 V Digital input / output terminal - PE Between AC 1000 V Analog input / output terminal - PE Between AC 1000 V LVDT 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, 1G @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 section	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 External power supply voltage: DC 24 V ±10%				
			OFF current	DC 1 mA or less				
	Ch 2: External forced closed 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%				
			OFF current	DC 1 mA or less				
	Ch 3,Ch 4: Valve position demand output *The type of 01/02 is switched by EMS	Number of channels		1				
		Insulation method		Digital isolator insulation				
		Dielectric strength		AC 1000 V Analog output terminal – PE Between				
		Rated output current		01 type	–20 to +20 mA (full scale)			
				02 type	–60 to +60 mA (full scale)			
		Load resistance range		01 type	40 to 400 Ω			
				02 type	10 to 160 Ω			
		Absolute precision	@25°C	01 type	±0.1% FS (±0.04 mA) @Calibration load (Factory shipped: 250 Ω)			
				02 type	±0.1% FS (±0.12 mA) @Calibration load (Factory shipped: 40 Ω)			
		Temperature drift		@–5 to 60°C	01 type	±100 ppm/°C (Against full scale)		
					02 type			
		Output current monitor				Built-in		
						01 type	±0.3% FS (±0.12 mA) @Calibration load	
						02 type	±0.3% FS (±0.36 mA) @Calibration load	
						01 type	±200 ppm/°C (Against full scale)	
		02 type						
	Ch 7: LVDT primary output *Output voltage and output frequency can be changed by internal logic setting	Number of channels		1				
		Insulation method		Digital isolator insulation, Photocoupler insulation				
		Dielectric strength		AC 1000 V Analog output terminal – PE Between				
		Excitation output voltage		5 to 8 V rms (Variable according to internal logic setting)				
		Excitation output frequency		800 to 8000 Hz (Variable according to internal logic setting)				
		Output voltage accuracy	Absolute precision	@25°C	±0.5% 230 Ω(at 5 kHz), @300 Ω(at 1 kHz)			
			Temperature drift	@–5 to 60°C	±200 ppm/°C			
Output frequency accuracy		Absolute precision	@25°C	±1%				
		Temperature drift	@–5 to 60°C	±200 ppm/°C				
Drive minimum coil impedance		120 Ω						
Output voltage monitor		Built-in						
		Absolute precision	@25°C	±0.3% FS (full scale: 5 to 8 Vms [Internal logic setting value])				
		Temperature drift	@–5 to 60°C	±200 ppm/°C (Against full scale)				
Ch 8, Ch 9: LVDT secondary input *The detection method of the effective value detection/synchronous (With or without phase correction) detection can be selected (Set by internal logic)		Number of channels		2				
	Insulation method		Digital isolator insulation, Photocoupler insulation					
	Dielectric strength		AC 1000 V Analog input terminal – PE Between					
	Rated input voltage		8 Vrms or less					
	Input voltage accuracy	Absolute precision	@25°C	±0.3% FS (full scale: 8 Vms)				
		Temperature drift	@–5 to 60°C	±200 ppm/°C (Against full scale)				

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ITEM				SPECIFICATION																																																				
Auxiliary output connector	Analog output	Number of channels		3																																																				
		Insulation method		Digital isolator insulation																																																				
		Dielectric strength		AC 500 V Analog output terminal – PE Between																																																				
		Rated output voltage		1 to 5 V (full scale)																																																				
		Minimum load resistance		2 kΩ																																																				
		Absolute precision	@25°C	±0.3% FS (±12 mV)																																																				
		Temperature drift	@-5 to 60°C	±200 ppm/°C (Against full scale)																																																				
Panel I / O connector	Digital input	Number of channels		DI (External power supply): 5 Connector dropout detection DI × 1																																																				
		Insulation method		Photocoupler insulation																																																				
		Dielectric strength		AC 500 V Digital input terminal – PE Between																																																				
		Current range	ON current		DC 2 mA or more																																																			
			OFF current		DC 1 mA or less																																																			
	Digital output	Number of channels		3																																																				
		Insulation method		Photocoupler insulation																																																				
		Dielectric strength		AC 500 V Digital output terminal – PE Between																																																				
		Maximum applied voltage		DC 30 V																																																				
		Maximum load current		0.1 A																																																				
		Leakage current at OFF		0.1 mA or less																																																				
		Maximum residual voltage when ON		DC 1.0 V @100 mA																																																				
	Analog input	Number of channels		3 (AI#1 to #3 in the Block diagram)																																																				
		Insulation method		Digital isolator insulation																																																				
		Dielectric strength		AC 500 V Analog input terminal – PE Between																																																				
		Rated input voltage		1 to 5 V (full scale)																																																				
		Input impedance		100 kΩ or more																																																				
		Absolute precision	@25°C	±0.3% FS (±12mV)																																																				
		Temperature drift	@-5 to 60°C	±200 ppm/°C (Against full scale)																																																				
	Analog input/output	Number of channels	3 (AI#4 to #6/AO#1 to #3 in the Block diagram)																																																					
		①When the analog input selection	Insulation method		Digital isolator insulation																																																			
			Dielectric strength		AC 500 V Analog input / output terminal – PE Between																																																			
			Rated output voltage		1 to 5 V (full scale)																																																			
			Input impedance		100 kΩ or more																																																			
			Absolute precision	@25°C	±0.3% FS (±12 mV)																																																			
			Temperature drift	@-5 to 60°C	±200 ppm/°C (Against full scale)																																																			
		②When the analog output selection	Insulation method		Digital isolator insulation																																																			
			Dielectric strength		AC 500 V Analog input / output terminal – PE Between																																																			
			Rated output voltage		1 to 5 V (full scale)																																																			
			Minimum load resistance		9 kΩ																																																			
			Absolute precision	@25°C	±0.3% FS (±12mV)																																																			
			Temperature drift	@-5 to 60°C	±200 ppm/°C (Against full scale)																																																			
		Output voltage monitor		1 to 5 V																																																				
		(AI / AO can be switched by internal logic setting)		When used as an analog output, AI#4 to #6 of the analog MCU in the block diagram becomes the read back of AO#1 to #3. Panel IO terminals AI#4/AO#1, AI#5/AO#2, and AI#6/AO#3 can be set with the following combinations. (The table below shows 2-bit representation of 4 ways 00 to 11 using two point numbers of internal logic)																																																				
		Remarks		<table><tr><th colspan="3">Internal logic (Number used as AO)</th><th colspan="2">Terminal name</th><th rowspan="2">AI#4 / AO#1</th><th rowspan="2">AI#5 / AO#2</th><th rowspan="2">AI#6 / AO#3</th><th rowspan="2">Pattern</th></tr><tr><th>Number used as AO (Decimal number)</th><th>DO1 (Binary number)</th><th>DO2 (Binary number)</th></tr><tr><td>0</td><td>0</td><td>0</td><td>AI</td><td>AI</td><td>AI</td><td colspan="3">3 inputs / 0 output (Factory setting)</td></tr><tr><td>1</td><td>0</td><td>1</td><td>AI</td><td>AI</td><td>AO</td><td colspan="3">2 inputs / 1 output</td></tr><tr><td>2</td><td>1</td><td>0</td><td>AI</td><td>AO</td><td>AO</td><td colspan="3">1 inputs / 2 outputs</td></tr><tr><td>3</td><td>1</td><td>1</td><td>AO</td><td>AO</td><td>AO</td><td colspan="3">0 inputs / 3 outputs</td></tr></table>						Internal logic (Number used as AO)			Terminal name		AI#4 / AO#1	AI#5 / AO#2	AI#6 / AO#3	Pattern	Number used as AO (Decimal number)	DO1 (Binary number)	DO2 (Binary number)	0	0	0	AI	AI	AI	3 inputs / 0 output (Factory setting)			1	0	1	AI	AI	AO	2 inputs / 1 output			2	1	0	AI	AO	AO	1 inputs / 2 outputs			3	1	1	AO	AO	AO	0 inputs / 3 outputs	
	Internal logic (Number used as AO)			Terminal name		AI#4 / AO#1	AI#5 / AO#2	AI#6 / AO#3	Pattern																																															
Number used as AO (Decimal number)	DO1 (Binary number)	DO2 (Binary number)																																																						
0	0	0	AI	AI	AI	3 inputs / 0 output (Factory setting)																																																		
1	0	1	AI	AI	AO	2 inputs / 1 output																																																		
2	1	0	AI	AO	AO	1 inputs / 2 outputs																																																		
3	1	1	AO	AO	AO	0 inputs / 3 outputs																																																		
Operation cycle usable in DPS				10 msec or more																																																				
Communication specification between IOA		Communication method , communication speed		LVDS, 100 Mbps																																																				

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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)
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		Supported (backplane uses LSI0B02 or LSI0B03) However, the signals of the auxiliary output connector and panel I/O connector are not duplicated
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
Operating power supply		DC 24 V $\pm 20\%$ 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		350 mA
Weight		0.24 kg
Dimensions		152.5 mm (D) x 94 mm (H) x 46mm (W) (Except projection)
Standard/Directive		EN 61131-2:2007, RoHS

About compliant module type

For compliant backplane of this product, please refer to “Compliant backplane list (CGS-S9901-E-XX)”.

For compliant accessory connector of this product, please refer to “Compliant accessory connector list (CGS-S9902-E-XX)”.

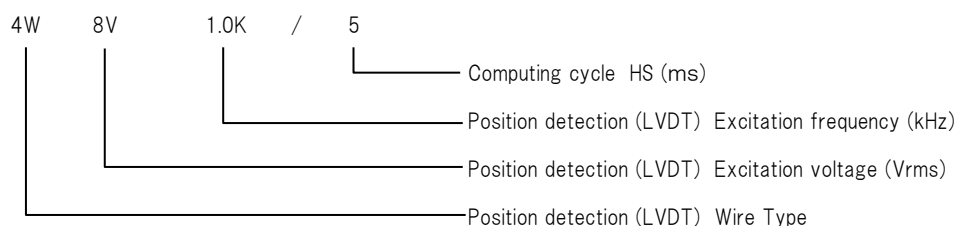


(Caution) This module may have different setting values.

A label (“4W8V 1.0K/5”, etc) on the front of the module indicates the setting value.

When replacing, do not use the module with different setting value.

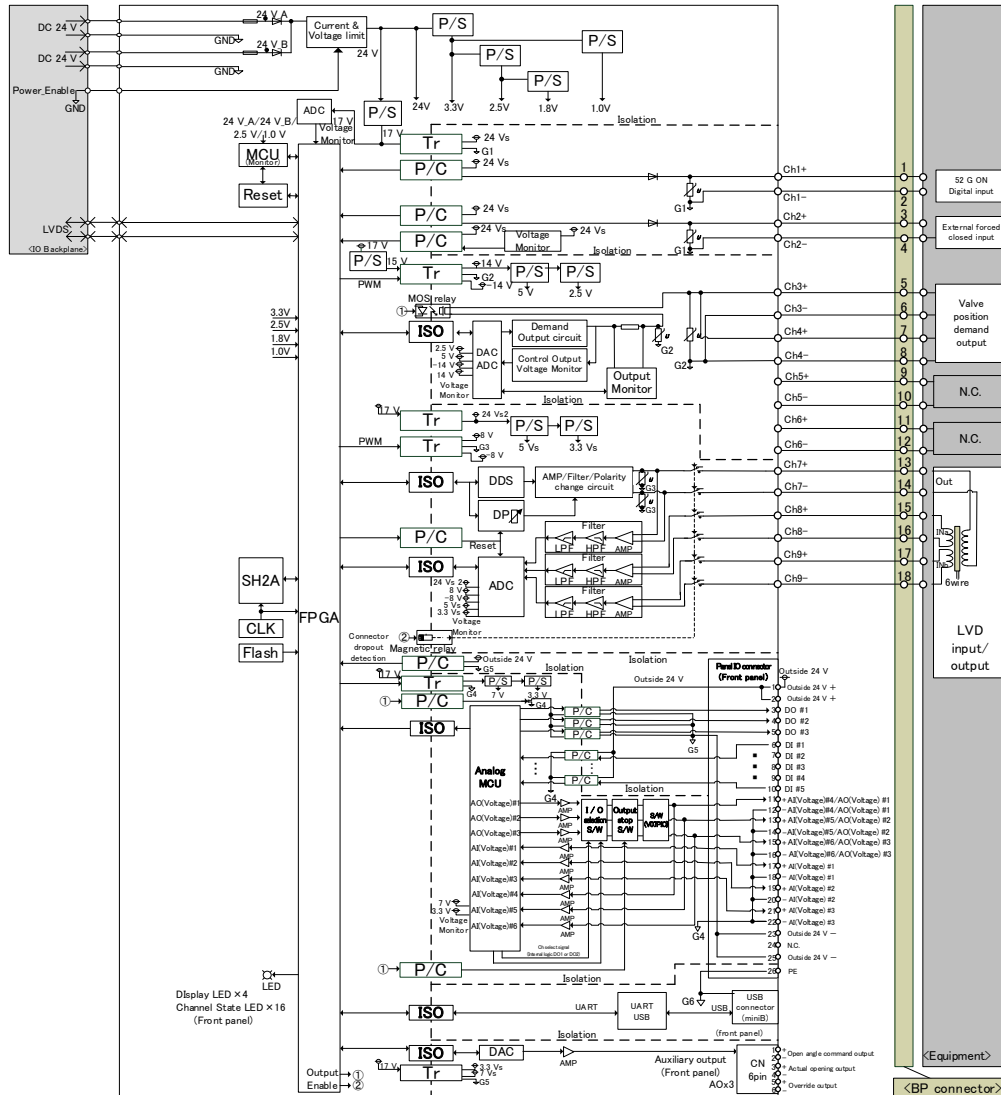
Example: How to read the label



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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,G6	: Ground
LVDS	: Low Voltage Differential Signaling	BP	: Backplane
AMP	: Amplifier	DDS	: Direct digital synthesizer
P/C	: Photo Coupler	DAC	: Digital analog converter
N.C	: No Connection	HPF	: High pass filter
AO	: Analog Output	Tr	: Transformer
PE	: Protective Earth	CN	: Connector
		Flash	: Flash ROM
		MOS relay	: Photo Metal-Oxide-Semiconductor relay
			Resistor
			Diode

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

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