

LSSVL12D 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: Less than 8 Vrms
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)

LSSVL12D Servo valve interface module

LS communication LVDT Servo valve interface

■ 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		
		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		
		Current range	ON current	DC 2 mA or more Sense supply voltage: DC 24 V ±10%		
			OFF current	Less than DC 1 mA		
	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		
		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 02 type	±100 ppm/°C (Against full scale)
		Output current monitor		Built-in		
				Absolute precision	@25°C	01 type
	02 type					±0.3% FS (±0.36 mA) @Calibration load
	Temperature drift			@-5 to 60°C	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				
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	±0.2% 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			
	Rated input voltage		Less than 8 Vrms			
	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)		

LSSVL12D Servo valve interface module

LS communication LVDT Servo valve interface

ITEM		SPECIFICATION																																					
Auxiliary output connector	Analog output	Number of channels	3																																				
		Insulation method	Digital isolator insulation																																				
		Dielectric strength	AC 500 V																																				
		Rated output voltage	1 to 5 V (full scale)																																				
		Minimum load resistance	2 k Ω																																				
		Absolute precision @25°C	$\pm 0.3\%$ FS (± 0.12 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 \times 1																																				
		Insulation method	Photocoupler insulation																																				
		Dielectric strength	AC 500 V																																				
		Current range	ON current DC 2 mA or more External power supply voltage: DC 24 V $\pm 10\%$ OFF current Less than DC 1 mA																																				
	Digital output	Number of channels	3																																				
		Insulation method	Photocoupler insulation																																				
		Dielectric strength	AC 500 V																																				
		Maximum applied voltage	DC 30 V																																				
		Maximum load current	0.1 A																																				
		Leakage current at OFF	Less than 0.1 mA																																				
	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																																				
		Rated input voltage	1 to 5 V (full scale)																																				
		Input impedance	100 k Ω or more																																				
		Absolute precision @25°C	$\pm 0.3\%$ FS (± 12 mV)																																				
	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)																																				
			Insulation method	Digital isolator insulation																																			
		①When the analog input selection	Dielectric strength	AC 500 V																																			
			Rated output voltage	1 to 5 V (full scale)																																			
			Input impedance	100 k Ω or more																																			
			Absolute precision @25°C	$\pm 0.3\%$ FS (± 12 mV)																																			
Temperature drift @-5 to 60°C			± 200 ppm/°C (Against full scale)																																				
Insulation method			Digital isolator insulation																																				
②When the analog output selection		Dielectric strength	AC 500 V																																				
		Rated output voltage	1 to 5 V (full scale)																																				
		Minimum load resistance	9 k Ω																																				
		Absolute precision @25°C	$\pm 0.3\%$ FS (± 12 mV)																																				
	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)	Remarks	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)																																					
		<table border="1"> <thead> <tr> <th rowspan="2">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">パターン</th> </tr> <tr> <th>DO1 (Binary number)</th> <th>DO2 (Binary number)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>AI</td> <td>AI</td> <td>AI</td> <td>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>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>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>0 inputs / 3 outputs</td> </tr> </tbody> </table>	Internal logic (Number used as AO)	Terminal name		AI#4 / AO#1	AI#5 / AO#2	AI#6 / AO#3	パターン	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	パターン																												
	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																																					

LSSVL12D Servo valve interface module

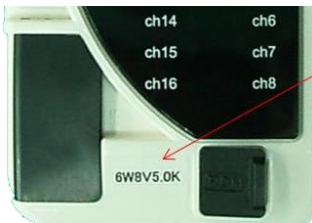
LS communication LVDT Servo valve interface

ITEM		SPECIFICATION
Self-diagnostic functions		Power voltage check (24 V, 17 V, 3.3 V, 1.2 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 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
Current consumption		Less than 350 mA
Weight		0.24 kg
Dimensions		152.5 mm (D) x 94 mm (H) x 46mm (W) (Except projection)
Standard/Directive		IEC61131-2:2007, RoHS

*About compliant module type

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

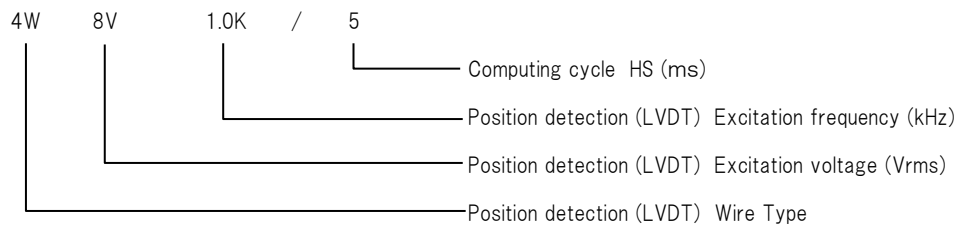
For compliant accessory connector of this product, please refer to "Compliant accessory connector list (CGS-S9902-E-XX)".



(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.

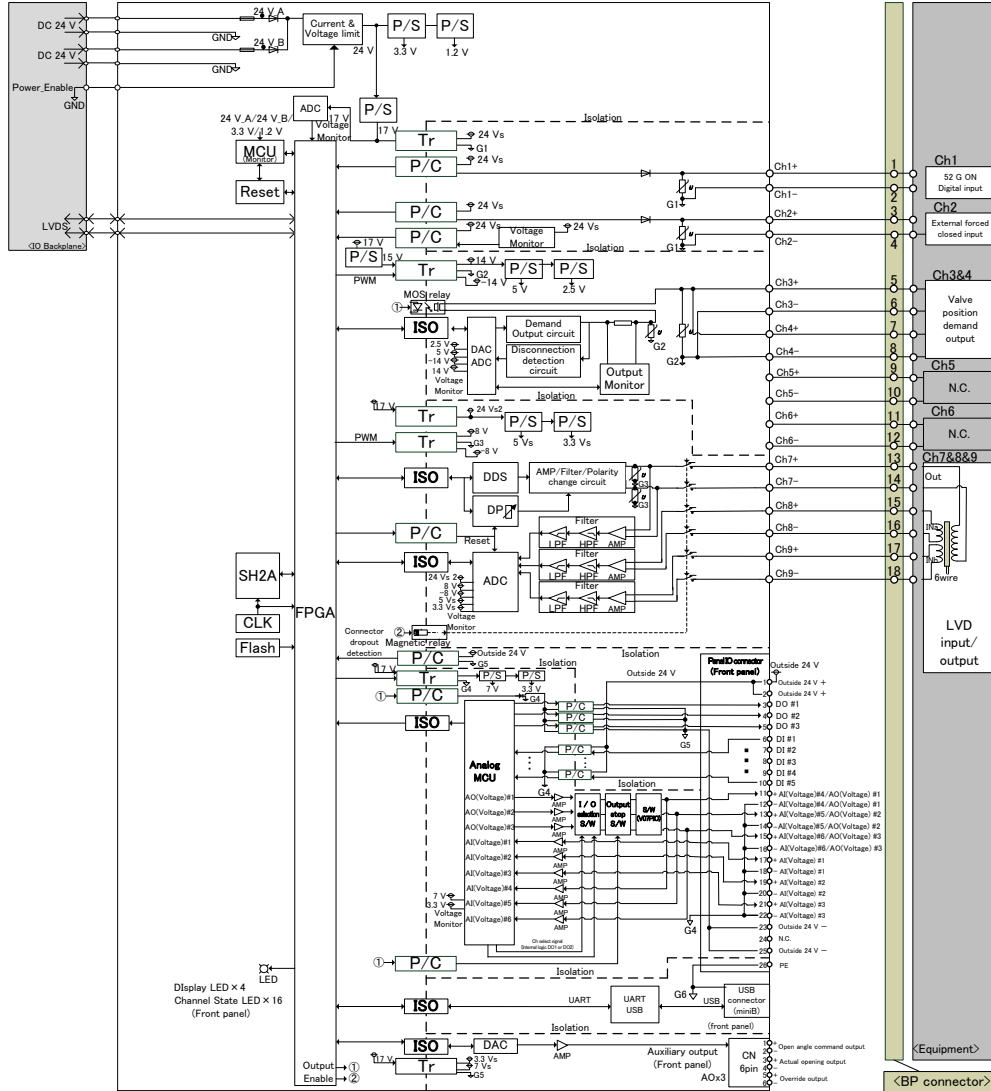
Example: How to read the label







LSSVL12D Servo valve interface module

LS communication LVDT Servo valve interface

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 |
| DP | : Digital potentiometer | DDS | : Direct digital synthesizer |
| PWM | : Pulse width modulation | DAC | : Digital analog converter |
| AMP | : Amplifier | HPF | : High pass filter |
| P/C | : Photo Coupler | Tr | : Transformer |
| N.C | : No Connection | CN | : Connector |
| AO | : Analog Output | Flash | : Flash ROM |
| PE | : Protective Earth | MOS relay | : Photo Metal-Oxide-Semiconductor relay |
|  | : Varistor |  | : Resistor |
|  | : Fuse |  | : Diode |

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

This catalog may not be distributed or reproduced in whole or in part without permission.

Please be aware that due to product improvements and modifications, the product description in this catalog may differ in certain respects from the actual product.

DIASYS Netmation/DIASYS Netmation4S is a registered trademark of Mitsubishi Heavy Industries, Ltd.

The service names and product names of other companies described in this catalog are the trademarks or registered trademarks of each company.