LSSVL12D SVL module

LS communication LVDT Servo valve Interface module

■Summary

＊Terminal block input / output unit
- ・Digital input : 2
- ・Valve position demand output : 1
- ・LVDT input / output : 1 (4/6 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 (52G ON/ External forced closed input)	DC24V×2 , minimum ON Current 2mA
Valve position demand output	±20mA / ±60mA ×1
LVDT input / output	4/6 Line type×1 , Output:5 to 8Vrms , Frequency:800 to 8000Hz , Input:Less than 8Vrms
Analog output (Auxiliary output connector)	1 to 5VDC×3
Digital input (Panel I/O)	DC24V×5 , Minimum ON current 2mA Connector dropout detection DI×1
Digital output (Panel I/O)	Open collector output×3 , Maximum voltage DC30V , Maximum load current 0.1A
Analog input / Input and output (Panel I/O)	1 to 5VDC×3 / 1 to 5VDC×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 : Ch1 to Ch16 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(Use LSIOB03 for Backplane) However, the signals of the auxiliary output connector and panel I / O connector are not duplicated
Dielectric strength	AC2000V Digital input / output terminal — PE Between AC1000V Analog input / output terminal — PE Between AC1000V LVDT input / output terminal — PE Between
Environmental conditions	(Operating) Ambient temperature : -5 to 60°C Ambient humidity : Less than 95%RH(No condensation) (Storage) Ambient temperature : -40 to 85°C Ambient humidity : Less than 95%RH(No condensation)
Operating power supply	DC 24V±20% Dual power reception (The voltage supplied from the backplane)
Shock / Vibration	15G 11ms / 3.5mm @5 to 8.4Hz , 1G @8.4 to 150Hz
Dimensions	152.5mmD x 94mmH x 46mmW (Except projection)

LSSVL12D SVL module

LS communication LVDT Servo valve Interface module

■Details Specifications

ITEM					SPECIFICATION	
Terminal block Input/output section	Ch1: 52G ON Digital input	Number of channels			1	
		Insulation method			Photocoupler insulation	
		Dielectric strength			AC2000V	
		Current range	ON current		DC 2mA or more External power supply voltage:DC24V ±10%	
			OFF current		DC 1mA or less	
	Ch2: External forced closed input	Number of channels			1	
		Insulation method			Photocoupler insulation	
		Dielectric strength			AC2000V	
		Current range	ON current		DC 2mA or more Sense supply voltage:DC24V ±10%	
			OFF current		Less than DC1mA	
	Ch3,Ch4: Valve position demand output *The type of 01/02 is switched by EMS	Number of channels			1	
		Insulation method			Digital isolator insulation	
		Dielectric strength			AC1000V	
		Rated output current			01type	-20 to +20mA (full scale)
					02 type	-60 to +60mA (full scale)
		Load resistance range			01type	40 to 400Ω
					02type	10 to 160Ω
		Absolute precision		@25°C	01type	±0.1%FS (±0.04mA) @Calibration load (Factory shipped :250Ω)
					02type	±0.1%FS (±0.12mA) @Calibration load (Factory shipped :40Ω)
		Temperature drift		@-5 to 60°C	01type 02type	±100ppm/°C (Against full scale)
		Output current monitor			Built-in	
			Absolute precision	@25°C	01 type	±0.3%FS (±0.12mA) @Calibration load
					02 type	±0.3%FS (±0.36mA) @Calibration load
			Temperature drift	@-5 to 60°C	01type 02type	±200ppm/°C (Against full scale)
	Ch7: 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			AC1000V	
		Excitation output voltage			5～8Vrms (Variable according to internal logic setting)	
		Excitation output frequency			800～8000Hz (Variable according to internal logic setting)	
		Output voltage accuracy	Absolute precision	@25°C	±0.2% 230Ω(at 5kHz) , @300Ω(at 1kHz)	
			Temperature drift	@-5～60°C	±200ppm/°C	
		Output frequency accuracy	Absolute precision	@25°C	±1%	
			Temperature drift	@-5 to 60°C	±200ppm/°C	
		Drive minimum coil impedance			120Ω	
		Output voltage monitor			Built-in	
			Absolute precision	@25°C	±0.3%FS (full scale : 5～8Vms [Internal logic setting value])	
			Temperature drift	@-5 to 60°C	±200ppm/°C (Against full scale)	
	Ch8,Ch9: 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			AC1000V	
		Rated input voltage			Less than 8Vrms	
		Input voltage accuracy	Absolute precision	@25°C	±0.3%FS (full scale : 8Vms)	
			Temperature drift	@-5 to 60°C	±200ppm/°C (Against full scale)	

LSSVL12D SVL module

LS communication LVDT Servo valve Interface module

ITEM				SPECIFICATION
Auxiliary output connector	Analog output	Number of channels		3
		Insulation method		Digital isolator insulation
		Dielectric strength		AC500V
		Rated output voltage		1 to 5V (full scale)
		Minimum load resistance		2kΩ
		Absolute precision	@25°C	±0.3%FS (±0.12mV)
		Temperature drift	@-5 to 60°C	±200ppm/°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		AC500V
		Current range	ON current	DC 2mA or more External power supply voltage:DC24V ±10%
			OFF current	Less than DC1mA
	Digital output	Number of channels		3
		Insulation method		Photocoupler insulation
		Dielectric strength		AC500V
		Maximum applied voltage		DC30V
		Maximum load current		0.1A
		Leakage current at OFF		Less than 0.1mA
		Maximum residual voltage when ON		DC1.0V @100mA
	Analog input	Number of channels		3(AI#1 to #3 in the Block diagram)
		Insulation method		Digital isolator insulation
		Dielectric strength		AC500V
		Rated input voltage		1 to 5V (full scale)
		Input impedance		100 kΩ or more
		Absolute precision	@25°C	±0.3%FS (±12mV)
		Temperature drift	@-5 to 60°C	±200ppm/°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		AC500V
		Rated output voltage		1 to 5V (full scale)
		Input impedance		100 kΩ or more
		Absolute precision	@25°C	±0.3%FS (±12mV)
		Temperature drift	@-5 to 60°C	±200ppm/°C (Against full scale)
	②When the analog output selection	Insulation method		Digital isolator insulation
		Dielectric strength		AC500V
		Rated output voltage		1 to 5V (full scale)
		Minimum load resistance		9kΩ
		Absolute precision	@25°C	±0.3%FS (±12mV)
		Temperature drift	@-5 to 60°C	±200ppm/°C (Against full scale)
		Output voltage monitor		1～5V
	(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)

Internal logic (Number used as AO) / Terminal name			AI#4 / AO#1	AI#5 / AO#2	AI#6 / AO#3	パターン
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

LSSVL12D SVL module

LS communication LVDT Servo valve Interface module

ITEM		SPECIFICATION
Operation cycle usable in DPS		10 msec or more
Communication specification between IOA	Communication method , communication speed	LVDS , 100Mbps
Self-diagnostic functions		Power voltage check (24V, 17V, 3.3V, 1.2V, 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		Unsupported(Use backplane LSIOB 03) 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 : Ch1～Ch16 Arbitrarily set by internal logic
Serial interface	For maintenance	1 : USB Serial (USB mini-B connector)
Hot swap		Possible
Operating power supply		DC 24V±20% Dual power reception(The voltage supplied from the backplane)
Environmental conditions	Module ambient temperature	(Operating) -5 to 60° C (Storage) -40 to 85° C
	Module ambient humidity	Less than 95%RH (No condensation)
Vibration		3.5mm @5 to 8.4Hz 1G @8.4 to 150Hz
Shock		15G 11ms
Current consumption		Less than 350mA
Weight		0.24kg
Dimensions		152.5mmD x 94mmH x 46mmW (Except projection)
Standard/Directive		IEC61131-2 : 2007, RoHS

*About compliant module type

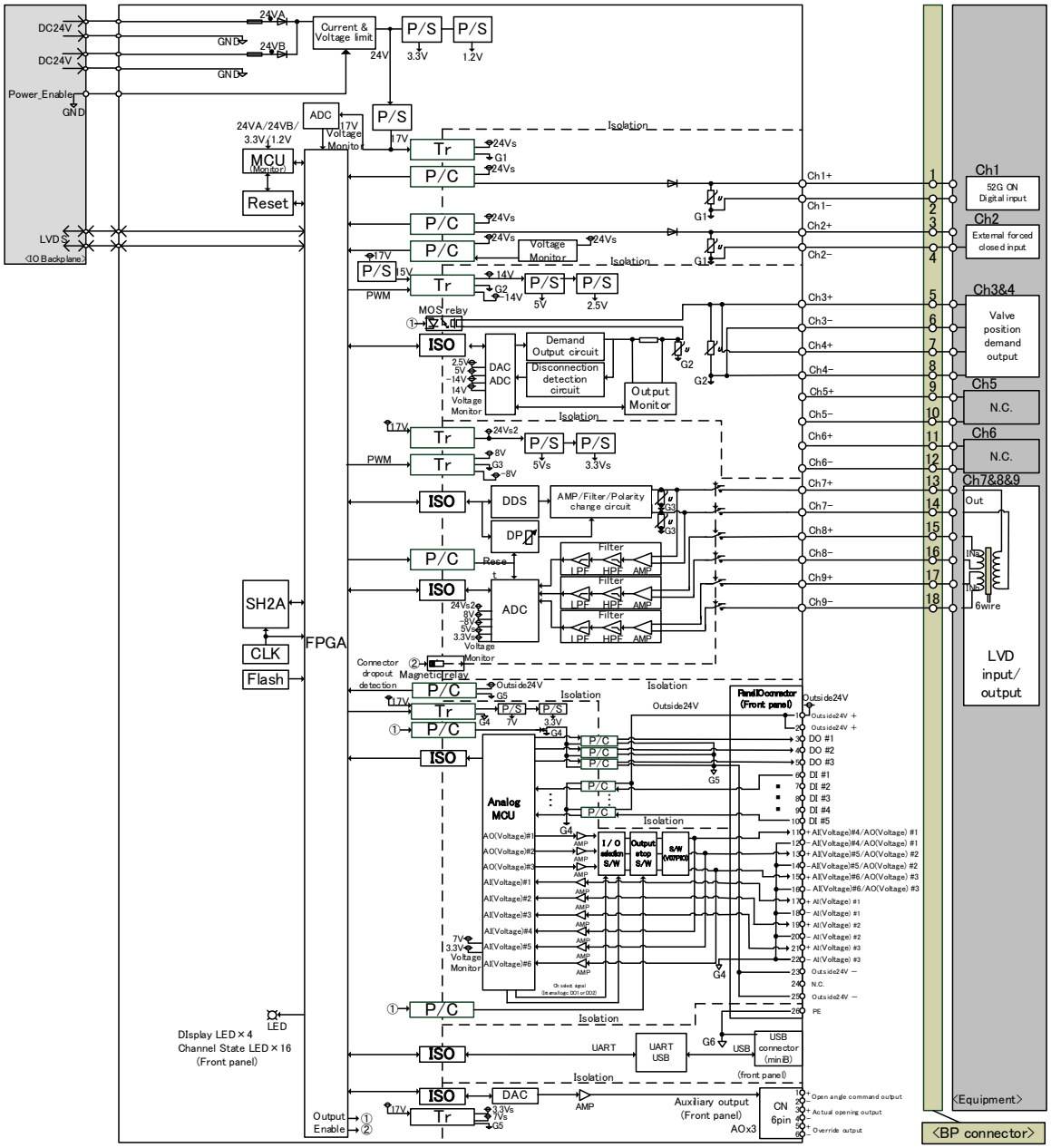
For compliant modules of this product, please refer to " Compliant backplane list (CGS-S9901-E-XX) ".

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

LSSVL12D SVL module

LS communication LVDT Servo valve Interface module

■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 potentio meter	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