

SCLSM01 Logic Solver

NXP QorIQ P2020 1.2 Ghz

■ Summary



* Processor	:	NXP (Old Freescale) QorIQ P2020 1.2 GHz
* Main memory	:	DDR3-800 SO-DIMM with ECC (Capacity: 1 GB)
* Communication FPGA	:	Xilinx Spartan6 (XC6SLX75T-3FGG676)
* Communication data buffer	:	DDR3 SDRAM (Capacity: 512 MB)
* Microcontroller	:	MC9S08JS16 (External Watchdog timer)
* User interface	:	
SD card slots	:	2 in total
		SD-1 : For logging
		SD-2 : For software programs
Switches	:	2 in total
		CONT : unused
		RST : For hardware reset
		ABO : For program abort
USB connectors	:	2 in total (Mini-B for maintenance communication)

* In compliance with Functional Safety Standard IEC 61508

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■ Specifications

ITEM		SPECIFICATION
Certification body		TÜV SÜD
Safety integrity level	(IEC 61508-1)	SIL3 (2oo4D, 2oo3D, 1oo2D), SIL2 (1oo1D) *2oo4D: 2 out of 4 with diagnostics
EMC Zone	(EN 61131-2)	B (Dedicated power distribution, rated voltage: 300 V or less)
Overvoltage category	(IEC 60664-1)	II (Energy-consuming equipment to be supplied from the fixed installation)
Isolation class	(IEC 60204-1)	II (Double insulated)
Hot-swapping		Supported (*Note that emergency stop signal processing must be handled by user circuitry.)
Major components	Processor	P2020NSE2MHC (1.2 GHz core)
	Main memory	DDR3-800 1 GB with ECC
	Communication data buffer	DDR3-667 512 MB
	Flash memory	SPI Flash 16 MB
	FPGA	XC6SLX75T-3FGG676C (100 MHz)
	Microcontroller (WDT)	MC9S08J16CFK (16 MHz)
Boot ROM		SD card
Data protection		ECC (1 bit error auto correction)
User interface		SD card: 2 ports (SDHC supported) Control/Reset/Abort (NMI) button: 3 in total (*Control button: unused)
Backplane interface		LVDS communication : 50 pairs I2C : 1 ch Slot Code : 6 in total
Serial interface		USB mini-B x 2
Bus standard		LVDS
Indicators		4 in total : Power / Status / Mode / Access
Self-diagnostic		Window watchdog timer Communication timeout detection Redundant voltage monitoring Clock abnormal check I/O signal range check Diverse calculation check Data format check Functional check of the abnormal communication signal RAM read-back check ECC: Error check and correct memory CRC: Cyclic redundancy check TPFS(Temporal Programming Flow Supervision): Loss-of-function check for system timers LPFS(Logical Programming Flow Supervision): Loss-of-function check for logical programming flow
Protection		Overvoltage protection Overcurrent protection Inrush current protection Reverse voltage protection Abnormal communication signal cutoff
Safe state		Safety Communication cutoff
Power supply		DC 24 V ± 10% (The voltage supplied from the backplane)
Current consumption		777 mA
Environmental conditions	Module ambient temperature	(Operating) -5 to +60°C (Storage) -25 to +85°C
	Module ambient humidity	(Operating / Storage) 0 to 95% RH (No condensation)
Vibration		3.5 mm at 5 to 8.4 Hz, 1 G at 8.4 to 150 Hz
Shock		15 G 11 ms
Weight		Less than 400 g
Size		112 mm (D) x 177.8 mm (H) x 51.8 mm (W) (Protrusions excluded)

About compliant module type

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

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■ Certified standards/Supported directives

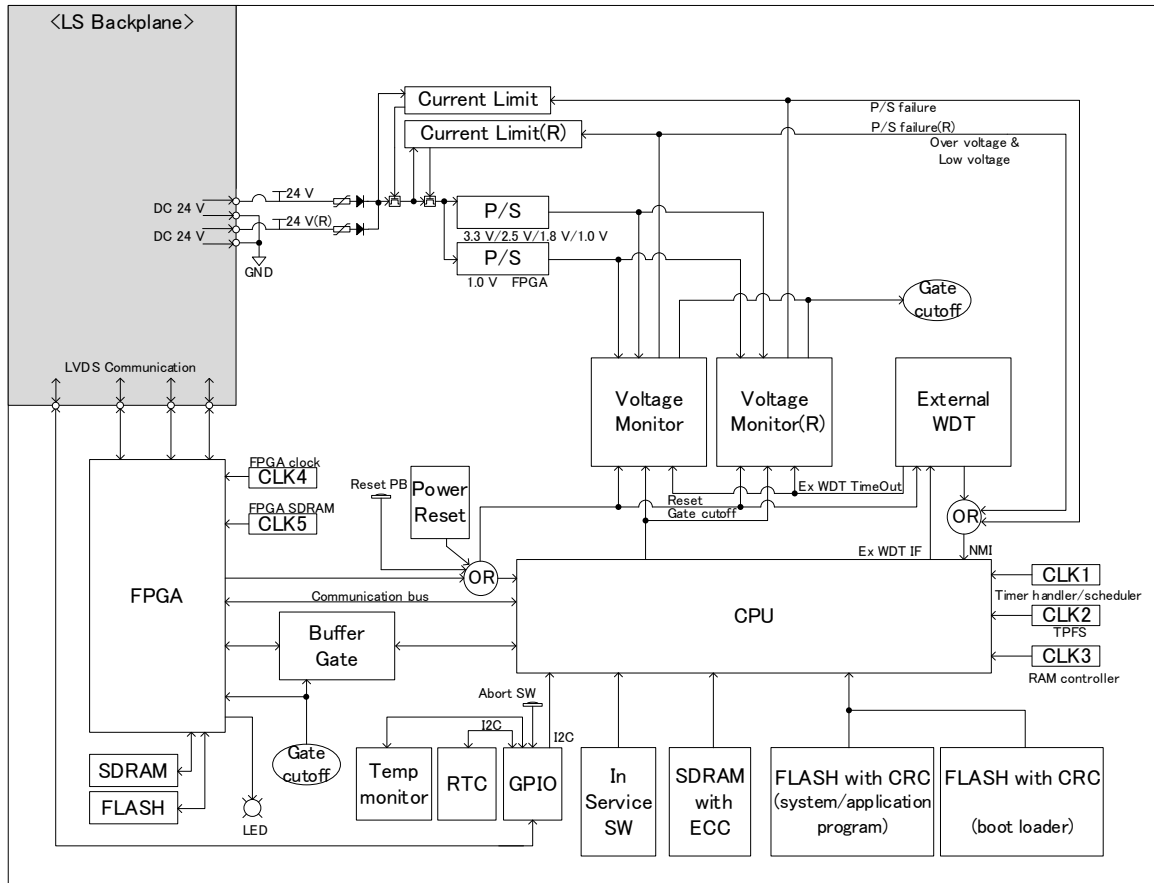
Certified standard	Year	Title
IEC 61508	2010	Functional safety of electrical/electronic/programmable electronic safety-related systems
EN 61131-2	2007	Programmable controllers – Part 2: Equipment requirements and tests
IEC 61131-6	2012	Programmable controllers – Part 6: Functional safety
IEC 61511-1	2004	Functional safety – Safety instrumented systems for the process industry sector – Part 1: Framework, definitions, system, hardware and software requirements,
EN 50156-1	2004	Electrical equipment for furnaces and ancillary equipment - Part 1 : Requirements for application design and installation
ISO 13849-1	2008	Safety of machinery – Safety-related parts of control systems–Part 1:General principles for design
EN 54-2	2007	Fire detection and fire alarm systems Part 2: Control and indicating equipment

Supported directive	Year	Title
RoHS	2011	DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
Low Voltage	2006	DIRECTIVE 2006/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 December 2006 on the harmonisation of the laws of Member States relating to Electrical Equipment designed for use within certain voltage limits
EMC	2004	DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC
Machinery	2006	DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, and amending Directive 95/16/EC

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■ Block diagram



(R)	;	Redundant
P/S	;	Power Supply
LS	;	Logic Solver
FPGA	;	Field Programmable Gate Array
CPU	;	Central Processing Unit
SDRAM	;	Synchronous Dynamic Random Access Memory
FLASH	;	Flash memory
Temp monitor	;	Temperature monitor
RTC	;	Real Time Clock
GPIO	;	General Purpose Input/Output
ECC	;	Error Check and Correction
CRC	;	Cyclic Redundancy Check
Ex WDT(IF)	;	External Watch Dog Timer (Interface)
NMI	;	Non Maskable Interrupt
SW	;	Switch
LED	;	Light Emitting Diode
GND	;	Ground
PB	;	Push Button
CLK	;	Clock Oscillate

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

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