

## DATA SHEET

### LS Programmable Logic Controller XGB(IEC) Compact Type

**XGB** XEC-DR32H  
XEC-DN32H  
XEC-DP32H  
XEC-DR64H  
XEC-DN64H  
XEC-DP64H  
XEC-DR32H/D1  
XEC-DR64H/D1

**LS**

- When using LSIS equipment, thoroughly read this datasheet and associated manuals introduced in this datasheet. Also pay careful attention to safety and handle the module properly.
- Store this datasheet in a safe place so that you can take it out and read it whenever necessary.

LSIS



Davis Controls Ltd is the authorized distributor of LSIS equipment and control solutions throughout Canada.

Founded in 1933, Davis Controls represents a strong and balanced portfolio of world class products. From head office facilities located in Oakville, Ontario, Davis Controls connects customers seeking high quality automation solutions with global manufacturers of state of the art products.

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Thank you for your business and your interest in LSIS solutions.

LS constantly endeavors to improve our products so that information in this datasheet is subject to change without notice.

The date of issue: 2011.5  
10310000979 Ver 3.0

#### ■ Safety Precautions

- Safety Precautions is for using the product safely and correctly in order to prevent the accidents and danger, so please go by them.
- The precautions explained here only apply to this module. For safety precautions on the PLC system, refer to User's manual.
- The precautions are divided into 2 sections, 'Warning' and 'Caution'. Each of the meanings is represented as follows.

**Warning** If you violate instructions, it can cause death, fatal injury or a considerable loss of property

**Caution** If you violate instructions, it can cause a slight injury or a slight loss of products

- The symbols which are indicated in the PLC and User's Manual mean as follows.
  - ! This symbol means paying attention because of danger of injury, fire, or malfunction
- This symbol means paying attention because of danger of electric shock.
  - ⚡ Store this datasheet in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user

#### ■ Handling Precautions

- Don't drop or make impact.
- Don't detach PCB from case. It may cause problem.
- When wiring, let no foreign material go into the module. If it goes into the module, remove it.
- Don't detach the module from slot while power is on



#### Warning

- ▶ Do not contact the terminals while the power is applied. Risk of electric shock and malfunction.
- ▶ Protect the product from being gone into by foreign metallic matter. Risk of fire, electric shock and malfunction.
- ▶ Risk of fire, electric shock and malfunction. Risk of injury and fire by explosion and ignition.

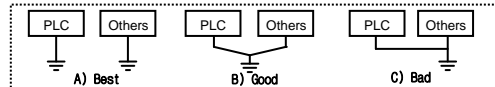


#### Caution

- ▶ Be sure to check the rated voltage and terminal arrangement for the module before wiring work. Risk of electric shock, fire and malfunction.
- ▶ Tighten the screw of terminal block with the specified torque range. If the terminal screw is loose, it can cause fire and electric shock.
- ▶ Use the PLC in an environment that meets the general specifications contained in this datasheet. Risk of electrical shock, fire, erroneous operation and deterioration of the PLC.
- ▶ Be sure that external load does not exceed the rating of output module. Risk of fire and erroneous operation.
- ▶ Do not use the PLC in the environment of direct vibration Risk of electrical shock, fire and erroneous operation.
- ▶ Do not disassemble, repair or modify the PLC. Risk of electrical shock, fire and erroneous operation
- ▶ When disposing of PLC and battery, treat it as industrial waste. Risk of poisonous pollution or explosion.

#### ■ Precautions for use

- Do not install other places except PLC controlled place.
- Make sure that the FG terminal is grounded with class 3 grounding which is dedicated to the PLC. Otherwise, it can cause disorder or malfunction of PLC



- ▶ Connect expansion connector correctly when expansion module is needed.
- Do not detach PCB from the case of the module and do not modify the module.
- Turn off power when attaching or detaching module.
- Cellular phone or walkie-talkie should be farther than 30cm from the PLC.
- Input signal and communication line should be farther than 10cm from a high-tension and a power line in order not to be affected by noise and magnetic field.

#### Related Manual

Read this data sheet carefully prior to any operation, mounting, installation or start-up of the product.

Name	Code
XG5000 User's Manual (Programming software)	10310000834
XGI Instruction & Programming User's manual	10310000833
XGB Hardware User's Manual (IEC Type)	10310000983
XGB Analog User's Manual	10310000920
XGB Position User's Manual	10310000927
XGB Cnet I/F User's Manual	10310000816
XGB Enet I/F User's Manual	10310000873

#### Revision History

Issued date	Version	Descriptions
2008.12	V1.0	First edition
2010.09	V2.0	Add new models(XEC-DP32H/DP64H)
2011.05	V3.0	KOREAN/ENGLISH data sheet integrated CI Changed

#### Applicable version

For system configuration, the following version is necessary.

Item	Applicable Version
XG5000	V3.4 or above

#### 1. General Specifications

No	Item	Specification	Standard
1	Operating temperature	0 ~ 55℃	-
2	Storage temperature	-25 ~ 70℃	-
3	Operating humidity	5 ~ 95%RH, non-condensing	-
4	Storage humidity	5 ~ 95%RH, non-condensing	-
5	Vibration resistance	For discontinuous vibration Frequency: 10sf ~ 57 Hz, Amplitude: 0.075 mm For continuous vibration Frequency: 57sf ~ 150 Hz, Amplitude: 0.035 mm 10 times in each direction for X, Y, Z	IEC61131-2
6	Shocks resistance	Max. impact acceleration: 147 ms <sup>-2</sup> (15G) Authorized time: 11 ms Pulse wave: Sign half-wave pulse (Each 3 times in X,Y,Z directions) Square wave pulse Impulse noise Electrostatic discharge Radiated electromagnetic field noise	IEC61131-2 LSIS standard IEC61131-2 IEC61000-4-2 IEC61131-2 IEC61000-4-3
7	Noise resistance	Fast transient /burst noise Segment Power supply module Voltage Digital/analog input/output communication interface	IEC61131-2 IEC61000-4-4
8	Ambient conditions	No corrosive gas or dust	-
9	Operating height	2000m or less	-
10	Pollution degree	2 or less	-
11	Cooling type	Natural air cooling	-

#### 2. Performance Specifications

Item	Specification	Remark
Operation method	Reiterative operation, fixed cycle operation Interrupt operation, constant period scan	
I/O control method	Scan synchronized batch processing method (Refresh method) Direct method by instruction	
Programming Language	Ladder Diagram (LD), SFC ( Sequential Function Chart), ST (Structured Text)	
Numbers of Instructions	Operator: 18 Basic function: 136 + Special function block: 43 Each special module has own special function blocks	
Execution Time	Basic instructions: 0.083μs/step	

#### 8. Built-in Communication Function

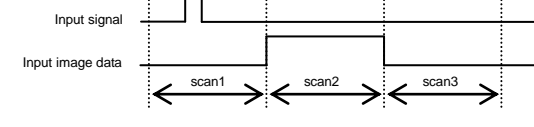
- (1) Dedicated communication  
XGB(IEC) Compact Type has built-in Cnet communication function, and can communicate with various external devices without expansion Cnet I/F module. By using XGT dedicated protocol, user can read, write, and monitor memory devices of XGB(IEC) Compact Type Main Unit.  
(XGB(IEC) Compact Type Main Unit has built-in RS-232C and RS-485.)  
Built-in Cnet of XGB Main Unit supports the following functions.
  - (a) Read single/continuous device
  - (b) Write single/continuous device
  - (c) Register monitoring device
  - (d) Execute monitoring
  - (e) 1:1 connection between LS PLCs
- (2) User defined communication  
User can define an user-defined protocol to communicate with other manufacturer's devices. By supporting user-defined protocol, XGB PLC can communicate with various devices which have their own protocol.
- (3) Modbus protocol  
XGB PLC includes Modbus protocol, and it is easy to connect to Modbus devices. (It is not necessary to write Modbus protocol as user-defined protocol.)
- (4) P2P communication support  
XGB PLC supports client function service with P2P form to above item.

#### Remarks

- (1) Please refer to XGB Cnet I/F User's Manual for the details of built-in Cnet I/F function.

#### 9. Other Built-in Function

- (1) Pulse Catch Function  
In the main unit, 8 pulse catch input contact points(%IX0.0.0~%IX0.0.7) are internalized. Through using this contact point short pulse signal(min. 10 ~ 50μs) which cannot be executed by general digital input can be taken.
  - (a) Usage  
When narrow pulse signal is input which can not be executed by general digital input, the operation can not be performed as user's intention. But in this case through pulse catch function even narrow pulse signal as 10μs min. can be executed.
  - (b) Operation Explanation



Step	Execution contents
Scan1	CPU senses input when pulse signal of min. 10 to 50μs, is input, then saves the status.(Note 1)
Scan2	Used to turn on the region of input image
Scan3	Used to turn off the region of input image

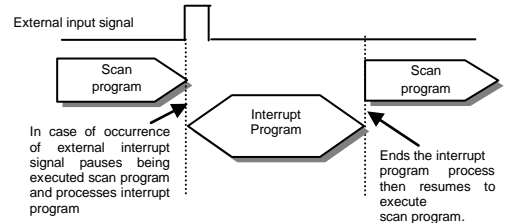
(Note 1) %IX0.0.0~%IX0.0.3: 10μs, %IX0.0.4~%IX0.0.7: 50μs

- (2) Input Filter Function  
The input filter function can be used to reject noises. The filter constant from the range of 1~100ms can be designated on the main unit and each expansion module independently.
  - (a) Usage  
Input signal status affects to the credibility of system where noise occurs frequently or pulse width of input signal affects as a crucial factor. In this case the user sets up the proper input on/off delay time, then the trouble by miss operation of input signal may be prevented because the signal which is shorter than set up value is not adopted.
  - (b) Operation Explanation

Narrower width pulse than input filter constant is not considered as input signal.

		Specification						Remark
Item		XEC-DR32H (D1)	XEC-DR64H (D1)	XEC-DN32H	XEC-DN64H	XEC-DP32H	XEC-DP64H	
Numbers of Instructions	Operator	18						
	Basic function	136 +	Floating-point Arithmetic Functions					
	Special function block	43						
	Each special module has own special function blocks.							
Execution Time		Basic instructions: 0.083μs/step						
Program memory capacity		200KB						
Data memory	Max. I/O points	352	384	352	384	352	384	
	Symbolic variable(A)	32KB (Max. 16K byte retain setting available)						
	Input variable(I)	2 KB (%IX15.15.63)						
	Output variable(O)	2 KB (%QX15.15.63)						
	M	16KB (Max. 8K byte retain setting available)						
	R	20KB (1block)						
	Direct variable	W	20KB					Same area with R
	F	2KB						System flag
	K	8KB						Special flag
	L	4KB						Link flag
Flag variable	N	10KB						P2P flag
	U	1KB						Analog flag
Flash area		20KB, 2blocks						Using R device
Timer		No limit in points (Time range: 0.001 ~ 4,294,967.295 s)						
Counter		No limit in points (Counter range: 64 bit range)						
Operation Mode		RUN, STOP, DEBUG						
Restart modes		Cold, Warm						
Numbers of program		128						
Task	Initialization task	1						
	Time driven task	8						
	External contact task	8(%IX0.0.0~%IX0.0.7)						
Internal device task		8						
Self-diagnostic functions		Watchdog Timer, Memory error detection I/O error detection, etc.						
Data keeping method at power failure		Setting to latch area at basic parameter						
Maximum expansion module		10						
PID Control function		Controlled by instruction, Auto tuning, PWM Operation Manual output, Operation scan time setting, Anti Windup, Delta MV, PV tracking, Hybrid Operation, Cascade Operation						
Cnet I/F		XGT Dedicated protocol support MODBUS protocol support User defined protocol support Selects one port between RS-232C 1 port and RS-485 1 port by parameter						
Internal function	speed	1 phase: 100kHz 4 Ch. / 20kHz 4 Ch. (10kHz 4Ch) #1 2 phase: 50kHz 2 Ch. / 10kHz 2 Ch. (5kHz 4Ch) #1						
	Mode	4 counter modes are supported based on input pulse and INC/DEC method • 1 pulse operation Mode : INC/DEC count by program • 1 pulse operation Mode : INC/DEC count by phase B pulse input • 2 pulse operation Mode : INC/DEC count by input pulse • 2 pulse operation Mode : INC/DEC count by difference of phase						
	Operation	32bit signed counter						
	Function	Internal/External preset function Latch counter function Comparison output function Revolution number per unit time function						
	Pulse Catch	Pulse width: 10μs ~ 4points(%IX0.0.0~%IX0.0.3) 50μs ~ 4points(%IX0.0.4~%IX0.0.7)						
	Positioning	Control axis: 2axes Control method: PTP/ speed control Control units: pulse Positioning data: 80 data per axis Positioning address: End/Keep/Continue, Single/Repeat Positioning address: Absolute/Incremental Positioning address: -2,147,483,648 ~ 2,147,483,647 Speed: Max. 100kpps(Setting range:1 ~ 100,000) Accel./Decel. Method: Trapezoidal method Origin detection when approximate origin turns off. Origin detection after declaration when approx. origin on Origin detection by approximate origin Setting range 1 ~ 100,000(High/Low speed) Inching operation, Speed synchronizing operation, Position synchronizing operation, linear interpolation operation etc.						XEC-DN32H XEC-DN64H XEC-DP32H XEC-DP64H Only
Input filter		Select for 1,3,5,10,20,70,100ms (For each module)						
Internal current consumption(mA)		660	1,040	260	330	300	380	
Weight(g)		600	900	500	800	500	800	

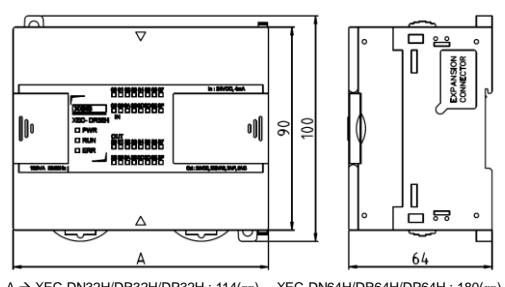
- (3) External interrupts function  
XGB PLC can perform max 8 points of external contact task by using input of main unit without special interrupt module
  - (a) Usage  
This function is useful to execute a task program set to an external input signal.
  - (b) Operation Explanation



- (c) Function
  - It can be use the max. 8 point input (%IX0.0.0 ~ %IX0.0.7).
  - Input 8 points(%IX0.0.0 ~ %IX0.0.7). of XGB(IEC) Compact Type Main Unit are shared for several functions as following table. Each of the functions can be disabled according to whether other functions are enabled.

Input Point	High Speed Counter	External Interrupt	Pulse Catch	Input Filter
%IX0.0.0	Ch0 Input	Disable	Disable	Usable
%IX0.0.1	Ch1 Input	Disable	Disable	Usable
%IX0.0.2	Ch2 Input	Disable	Disable	Usable
%IX0.0.3	Ch3 Input	Disable	Disable	Usable
%IX0.0.4	Ch4 Input	Disable	Disable	Usable
%IX0.0.5	Ch5 Input	Disable	Disable	Usable
%IX0.0.6	Ch6 Input	Disable	Disable	Usable
%IX0.0.7	Ch7 Input	Disable	Disable	Usable

#### 10. Dimension (mm)

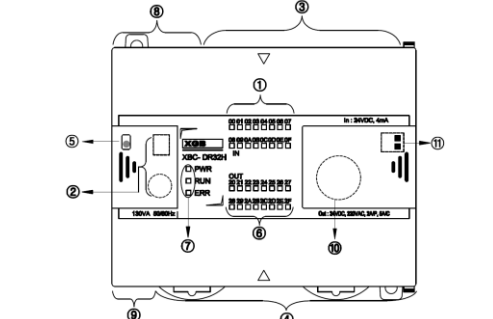


A → XEC-DN32H/DR32H/DP32H : 114(mm), XEC-DN64H/DR64H/DP64H : 180(mm)

#### 11. Warranty

- (1) Warranty period  
LSIS provides an 18-month-warranty from the date of the production.
- (2) Warranty conditions  
For troubles within the warranty period, LSIS will replace the entire PLC or repair the troubled parts free of charge except the following cases.
  - (a) The troubles caused by improper condition, environment or treatment except the instructions of LSIS.
  - (b) The troubles caused by external devices.
  - (c) The troubles caused by remodeling or repairing based on the user's own discretion.
  - (d) The troubles caused by improper usage of the product.
  - (e) The troubles caused by the reason which exceeded the expectation from science and technology level when LSIS manufactured the product.
  - (f) The troubles caused by natural disaster.
- (3) This warranty is limited to the PLC itself only. It is not valid for the whole system which the PLC is attached to.

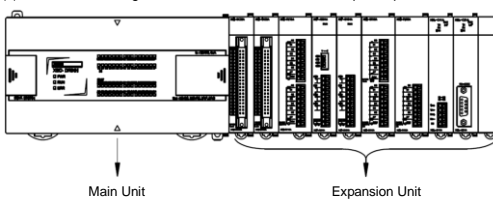
#### 3. Parts Names and Descriptions



No	Name	Description
①	Input status LED	■ Indicates input status. ■ Connector to connect with external device(XG5000) ■ USB(USB 1.1 supported) 1 Ch., RS-232C 1 Ch.
②	PADT Connector	■ Input Terminal Block
③	Input TB	■ Output Terminal Block
④	Output TB	■ It sets the operation mode of XGB PLC. - STOP → RUN : Operation execution of program - RUN → STOP : Operation stop of program (In case of STOP, it can be changed to remote mode.)
⑤	RUN/STOP Mode Switch	■ Indicates output status ■ Indicates the operation status of the CPU. - PWR(RE D) : Indicates power status. • On : normal status • Off : abnormal status or off - RUN(GREEN) : RUN status • On : Run • Off : Stop - Error(RE D) : Indicates an error status • Off : Normal • Flicker : An error is detected by self diagnostic during operation
⑥	Output status LED	■ Built-in RS-232C/485 Terminal Block
⑦	Operation status LED	■ Power Terminal Block ■ Battery(3V) holder for data back-up ■ Dip Switch for setting operation or O/S download mode
⑧	Built-in Communication TB	
⑨	Power TB	
⑩	Battery Holder	
⑪	O/S Mode Dip Switch	

#### 4. I/O No. Allocation Method

- (1) I/O No. Allocation grants address to unit & module for input/output data.



Mounting Module	Maximum No. of module can be mounted
Expansion I/O module	10
Analog I/O module	10
Communication module	2