LS Programmable Monitoring Unit

XGT-Panel Series

- **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.**

LS Industrial Systems Co., Ltd.

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

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Safety Instructions

► To prevent injury and property damage, following these instructions.

► Incorrect operation due to ignoring instructions will cause harm or damage, the seriousness of which is indicated by following symbols

⚠ **Warning** This symbol indicates the possibility of death or serious injury

⚠ **Caution** This symbol indicates the possibility of injury or damage to property

► The meaning of each symbol in this datasheet and on your equipment is as follows.

⚠ This is the safety alert symbol.
Read and follow instructions carefully to avoid dangerous situation.

⚡ This symbol alerts the user to the presence of "dangerous voltage" inside the product that might cause harm or electric shock.
means paying attention because of danger of electrical 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.

⚠ 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.

► Do not charge, heat, short, solder and break up the battery.
  It can cause 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 looses, it can cause fire and electric shock.

► Use the product in an environment that meets the general specifications contained in this datasheet.
  Risk of electrical shock, fire, erroneous operation and deterioration of the HMI

► Be sure that external load does not exceed the rating of output module.
  Risk of fire and erroneous operation.

► Do not use the HMI in the environment of direct vibration.
  Risk of electrical shock, fire and erroneous operation.

► Do not disassemble, repair or modify the HMI.
  Risk of electrical shock, fire and erroneous operation.

► When disposing of HMI and battery, treat it as industrial waste.
  Risk of poisonous pollution or explosion.

Precautions for use

► Do not detach PCB from the case of the product and do not modify the product.
► Cellular phone or walkie-talkie should be farther than 30cm from the product.
Input signal and communication line should be farther than minimum 100mm from a high-tension line and a power line in order not to be affected by noise and magnetic field.

Before handling the product

Before using the product, read the datasheet and the User's manual through to the end carefully in order to use the product efficiently.

| Name	Code
XGT Panel User's Manual	10310000482

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1. Introduction

This data sheet provides brief information about characteristics, configuration, and usage of the XGT Panel.

2. General Specifications

No	Item	Specifications					Standard
1	Operating temperature	0℃ ～ +50℃ (32°F ～ 122°F)					
2	Storage temperature	-10℃ ～ +60℃ (14°F ～ 140°F)					
3	Operating Humidity	5～85%RH, non-condensing					
4	Storage humidity	5～85%RH, non-condensing					
5	Vibration	Occasional vibration			Sweep count		IEC61131-2
		Frequency	Acceleration	Amplitude	10 times in each direction for X, Y, Z		
		10≤f< 57 ㎐	-	0.075mm			
		57≤f≤150 ㎐	9.8 ㎨	-			
		Continuous vibration					
		Frequency	Acceleration	Amplitude			
		10≤f< 57 ㎐	-	0.0375mm			
		57≤f≤150 ㎐	4.9 ㎨	-			
6	Shocks	* Maximum shock acceleration : 147 ㎨{15G} * Duration time : 11 ㎳ * Pulse wave : half sine wave pulse (3 times in each of X, Y and Z directions)					IEC61131-2
7	Noise immunity	Square wave impulse noise	±500V				LSIS Internal Standard
		Electrostatic discharge	Voltage : 4 kV(contact discharge)				IEC61131-2, IEC61000-4-2
		Radiated electromagnetic field	27 ~ 500 MHz, 10 V/m				IEC61131-2, IEC61000-4-3
		Fast transient / Burst noise	Voltage	1 kV			IEC61131-2, IEC61000-4-4
8	Atmosphere	Free from corrosive gases and excessive dust					
9	Altitude for use	Up to 2,000m					
10	Pollution degree	2 or lower					
11	Cooling method	Air-cooling					

3. Names of Parts and Descriptions
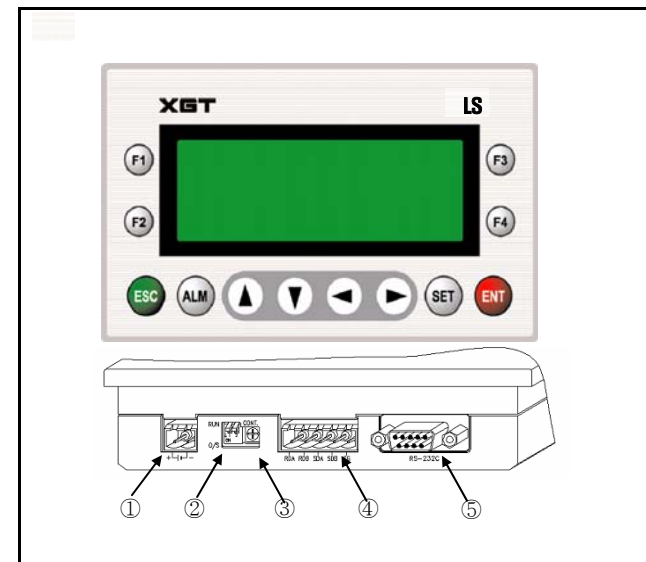
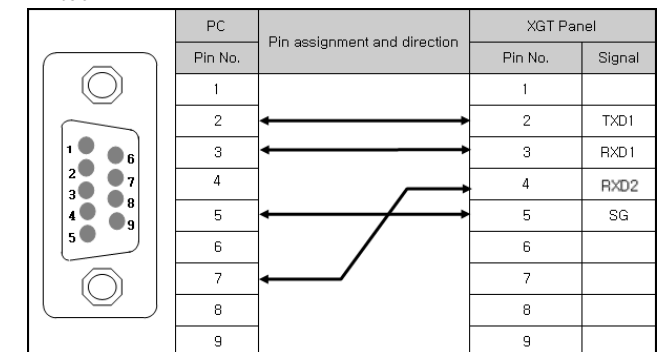| No	Name	Function		
①	Power supply connector	2 pin connector for the external 24VDC input		
②	Mode switch		DIP 1	DIP 2	Mode
		RUN	RUN	Operating mode
		O/S	O/S	O/S downloading mode
③	Variable resistor	Variable resistor for adjusting contrast		
④	RS-422/485 connector	RS-422/485 connector for communication channel 2		
⑤	RS-232C connector	RS-232C connector for communication channel 1		

4. Performance Specifications

Item		Specifications		Remark
		XP10BKA/DC	XP10BKB/DC	
Input power		4.9 ~ 5.1VDC (RS-232C Connector), 21.6V ~ 26.4VDC (Power supply connector)		Refer to User's Manual for 5VDC
Display		LED Back-Light(192*64 Dot)		
Communication Interface		RS-232C, RS-422/485		Independent 2 channels
Memory		256 Kbyte		
Languages		English, Chinese, Korean		
RTC		None	Supports	
Up/Download spec.		Speed : 115,200 bps Each memory area can be up/downloaded in part		
Keys		12 KEY (F1~F4,ESC,ALM,▲,▼,◄,►,SET,ENT)		
System memory	User area	M000 ~ M899 (900 Word)		Latch area is supported, in XP10BKB/DC
	System flags	M900 ~ M999 (100 Word)		-
Standard Certification		UL/CE		-
Size (W x H x D)		150 x 93 x 35		(mm)
Panel Cut (W x H)		141 x 87		(mm)
Weight		0.4		(Kg)

5. Communication Specifications

1) Up/Download interface

The PC and the XGT Panel should be connected by RS–232C communication interface for up/downloading program data. Wiring is as below.

PC		Pin assignment and direction	XGT Panel	
Pin No.			Pin No.	Signal
1			1	
2		↔	2	TXD1
3		↔	3	RXD1
4			4	RXD2
5			5	SG
6			6	
7			7	
8			8	
9			9	

Download means that program data is transmitted from PC to the XGT Panel, and upload is case to be opposed. Downloaded program data is preserved permanently in state of being stored in flash memory even though power is off.
To download program data to the XGT Panel, it must be powered with DC 24V and connected to PC with up/download cable. Then use the up/download menu of Panel Editor.

2) RS–232C communication interface

With the RS-232C communication interface of the XGT Panel, data communication with PLC, inverter and various kinds of control unit is possible. In this case, communication cable must be connected properly. Cable wiring for communication with LG PLC is as follow, and for more details refer to the XGT Panel user's manual.

| XGT Panel	Pin assignment and direction	MASTER-K main unit	
Pin No.		Pin No.	Signal
1	⟷	1	5V
2	⟷	2	RXD1
3	⟷	3	TXD1
4	⟷	4	RXD2
5	⟷	5	SG
6	⟷	6	5V
7	⟷	7	TXD2
8	⟷	8	SG
9		9	SG

* G4M-CPUC in LS PLC does not support 5V supply.

### 3) RS–422/485 communication interface

With the RS-422/485 communication interface of the XGT Panel, data communication like 1:1, 1:N multi-drop, N:M multi-master with PLC, inverter and various kinds of control units is possible. In this case, communication cable must be wired properly.

Cable wiring for communication with LS PLC is as follow, and for more details, refer to the XGT Panel user's manual.

(1) RS-422 communication wiring

Master   Slave   Slave   Slave

(2) RS-485 communication wiring

Master   Slave   Slave   Slave
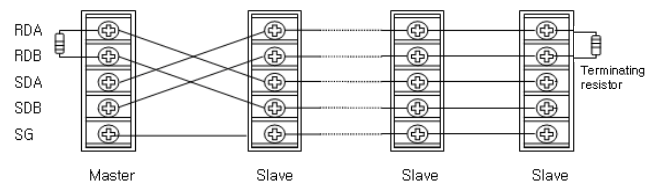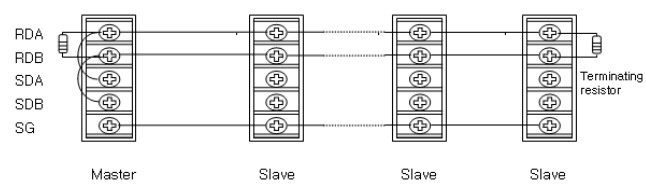
120 Ω, 1/2W Terminating Resistor is Recommended

6. Communication System Configuration

This chapter describes information about the communication system configuration.

1) 1:1 communication system configuration

The XGT Panel has two independent channels which are RS-232C and RS-422/485. It is possible to configure flexible 1:1 communication system with them.

The following is an example configured with a XGT Panel, a PLC and an inverter.


2) 1:N communication system configuration

This part explains 1:N multi-drop configuration with RS-422/485 channel of the XGT Panel. In this case, the XGT Panel becomes a master and other units become slaves.

The total settable station number is 32.(station 0 – 31)

RS-232C

RS-485

3) N:M multi-master communication system configuration

The XGT Panel supports N:M multi-master and multi-slave communication. The XGT Panels which are set as a master communicate with slaves in turn using the token. In this case, every XGT Panel set as a master must have same communication setting data except HMI station number. The total settable station number is 32.(station 0 – 31)

RS-422/485
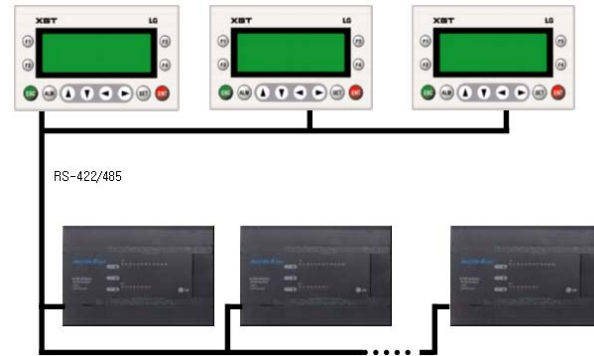
7. Operation

1) Introduction

This chapter explains the operation of the XGT Panel. For more details refer to the user's manual.

2) Key

Key	Function description
F1	- The function assigned to F1 key is executed. - For details about the function, refer to the user's manual
F2	- The function assigned to F2 key is executed.
F3	- The function assigned to F3 key is executed.
F4	- The function assigned to F4 key is executed.
ESC	- Display the names of screen defined. - Cancel the change of the value, or go back in case of menu. - In case of alarm, clear the alarm message displayed in the screen.
ALM	- Display alarm history.
▲	- The function assigned to ▲ key is executed. - When changing the value of the digit tag, increase the number of the current cursor position by 1. - Move up the cursor in menu.
▼	- The function assigned to ▼ key is executed. - When changing the value of the digit tag, decrease the number of the current cursor position by 1. - Move down the cursor in menu.

키	Function description
◀	- The function assigned to ◀ key is executed. - If there is no defined function, go to the previous screen defined in the current screen. - When changing the value of the digit tag, move the current cursor position to the left.
▶	- The function assigned to ▶ key is executed. - If there is no definition, go to the next screen defined in the current screen. - When changing the value of the digit tag, move the current cursor position to the right.
SET	- Enter the value-changing mode.
ENT	- In value-changing mode, write the set value. - Enter the setting menu. - Execute the selected item in menu.

If the key is valid the buzzer beeps 1 time, if not, 3 times.

3) Writing data

(1) The tags which are possible to write the data are digit tag and button tag. But in case that password is set, password must be unlocked before writing the data.
(2) In monitor mode, pressing the SET key leads to value-changing mode. If there's no tag to be written to, it will be invalid.
(3) The cursor will be located on the nearest tag to the left top of the screen.
(4) If the SET key is pressed again, the cursor moves to the next writing enabled tag.
(5) In case of digit tag, after changing the value of the tag with arrow keys, execute writing the value with ENT key. In case of button tag, when the cursor is located on the tag, execute the order defined on the tag with ENT key.

4) Alarm

(1) In alarm state, the alarm message is displayed at the bottom of the screen flickering. If the buzzer option is set, it will beep. At this time, only ESC and ALM key are valid. In XP10BKB/DC type, two time data will be saved. One data is the time when the alarm happened and the other data is the time when it was cleared.
(2) In monitor mode, the following messages will be displayed if ALM key is pressed.

    1. ALL ALARM LOG LIST
    2. DEFINED ALARM LIST

If you select 1, the recent alarm messages will be displayed up to 100 items in order
If you select 2, the recent Defined Alarm list will be displayed up to 10 items in order.

5) Password

(1) In case that password is set to the XGT Panel, it is impossible to write data to the writing enabled tag and to execute the function key set password at. In this case, it doesn't operate normally until the password is released.
(2) In monitor mode, the following menu will be displayed if ENT key is pressed.

    1. PASSWORD UNLOCK
    2. PASSWORD LOCK
    3. PASSWORD CHANGE

If you select 1, the password become unlocked if you input correct password. If there is no password, the following message will be displayed.

    PASSWORD NO EXIST!

In state that password is unlocked, the operations which are set password to is executable.
This is valid until the password is locked.
If you select 2, the password is locked.
If you select 3, the password is able to be changed.
The password is less than 10 digits.

* If the password is set to 0, it is cleared.

⚠ Caution

▶ **Do not forget the password**
    If the password is forgotten, you may not be able to use the major functions of the product.

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6) Date / Time set(XP10BKB/DC type only)

(1) When the cursor is on 3 of **5)**-(2) menu, pressing ▼ key leads to the following menu.
    4. DATE / TIME SET
    5. BUZZER VOLUME SET
    6. BACKLIGHT SET

If you select 4, current date and time will be displayed.
They can be changed with SET key.
The date and the day of the week must correspond.

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7) Buzzer, backlight set

(1) If you select 5 of **6)**-(1) menu, the volume level of the buzzer can be adjusted.
(2) If you select 6 of **6)**-(1) menu, backlight can be ON/OFF.
(3) In case that backlight option is selected, if no key is inputted during setting time, backlight will be off automatically. In this case, whichever key is pressed, the function assigned to the key is not executed but backlight is just on.

8) Changing screen

(1) When the power is supplied to a XGT Panel, the defined first screen will be displayed. If it doesn't exist, the first defined screen will be displayed.
(2) In monitor mode, the defined screen list will be displayed if ESC key is pressed. Using ▲, ▼, ENT key, it is possible to change the screen.
(3) In monitor mode, pressing ◀, ▶ key, the screen will move to the defined previous, next screen for each. If the screen doesn't exist, no move will happen.
(4) In case that screen saver option is set, if no key is inputted during setting time, the screen will be move to the defined screen. At this time, whatever key is inputted, the screen won't move and the function assigned to the key will be executed. If the screen doesn't exist, no move will happen.
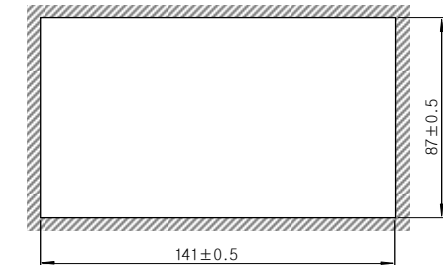
9) Continuous keystroke

When pressing a key, if the key is held down for more than 1 second, the function assigned to the key will be executed repeatedly.

8. Dimension(mm)

1) External dimension
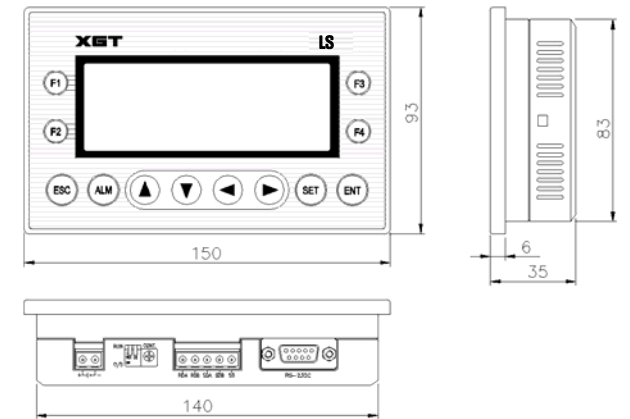
2) Cutting dimension

9. 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 HMI or repair the troubled parts free of charge except the following cases.

    (1) The troubles caused by improper condition, environment or treatment except the instructions of LSIS.

    (2) The troubles caused by external devices.

    (3) The troubles caused by remodeling or repairing based on the user's own discretion.

    (4) The troubles caused by improper usage of the product.

    (5) The troubles caused by the reason which exceeded the expectation from science and technology level when LSIS manufactured the product.

    (6) The troubles caused by natural disaster.

3. This warranty is limited to the HMI itself only. It is not valid for the whole system which the HMI is attached to.