DATA SHEET

Profibus Option

SV-iS7 Series

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.**

LS Industrial Systems Co., Ltd.

- Head Office
  LS tower, Hogye-dong, Dongan-gu, Anyang-si, Gyeonggi-do 1026-6, Korea
- Domestic Sales Team

Automation sales team	TEL:+82-2-2034-4620~34	FAX:+82-2-2034-4622
Busan sales team	TEL:+82-51-310-6855~9	FAX:+82-51-310-6851
Deagu sales team	TEL:+82-53-603-7740~5	FAX:+82-53-603-7788
Gwangju sales team	TEL:+82-62-510-1885~91	FAX:+82-62-526-3262
Deajeon sales team	TEL:+82-42-820-4240~2	FAX:+82-42-820-4298
Jeonju sales team	TEL:+82-63-271-4012	FAX:+82-271-2613

- Overseas Sales Team
  Automation sales team   TEL:+82-2-2034-4640~7   FAX:+82-2-2034-4648

- Web site
  http://www.lsis.biz

- Overseas Branches

USA	New Jersey Branch	+1-201-816-2985
China	Beijing Branch	+86-10-6462-3256
	Shanghai Branch	+86-21-6278-4370
	Guangzhou Branch	+86-20-8755-3429
JAPAN	Tokyo Branch	+81-3-3582-9128
Vietnam	Hanoi Branch	+84-4-882-0222

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

10310000XXX(V1.0)
2008. 6

Safety Precautions

- Safety Precautions are for using the product safe and correct in order to prevent the accidents and danger, so please go by them.
- The precautions explained here only apply to the iS7 Profibus Option. For safety precautions on the Inverter system, refer to the iS7 User's manual.
- The precautions are divided into 2 sections, 'Warning' and 'Caution'. Each of the meanings is represented as follows.

⚠ **Warning**   If violated instructions, it can cause death, fatal injury or considerable loss of property.

⚠ **Caution**   If violated instructions, it can cause a slight injury or slight loss of products

- The symbols indicated in products and datasheet mean as follows

⚠ This symbol means pay 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.

⚠ Warning

- **Do not contact the terminals while the power is applied.**
  It can cause electric shock and malfunction.

- **Protect the product from being gone into by foreign metallic matter.**
  It can cause fire, electric shock and malfunction.

⚠ Caution

- **Be sure to check the rated voltage and terminal arrangement for the module and observe them correctly.**
  It can cause fire, electric shock and malfunction.

- **Tighten up the terminal screw firmly to defined torque when wiring.**
  If the terminal screw looses, it can cause fire and electric shock.

- **Do not install around inflammable substances.**
  It can cause fire.

- **Use in an environment that meets the general specifications contained in this datasheet.**
  It can cause electrical shock, fire, erroneous operation and deterioration.

- **Be sure that external load does not exceed the rating of output module.**
  It can cause fire and erroneous operation.

- **Do not use in the environment of direct vibration.**
  It can cause electrical shock, fire and erroneous operation.

- **Do not disassemble, repair or modify except A/S specialist.**
  It can cause electrical shock, fire and erroneous operation.

- **When disposing, treat it as industrial waste.**
  It can cause poisonous pollution or explosion.

Precautions for use

- This option card is for SV-iS7 only. Don't install it to any other device than SV-iS7.
- When using the product, use the inverter with grounded. For the method of GND, please refer to the instruction manual of inverter body.
- Be sure to connect inverter and option card exactly. For the method of connection, Please refer to "6. How to install option" in iS7 User's Manual.
- Do not separating or remodeling the PCB of Option card.
- Turn off when install or uninstall the option.
- Use Mobile or Radio telegraph at 30cm away from the product.
- Input/output signal or communication wire should be 100mm away from high voltage cable or power line.

INSTRUCTIONS TO USERS

Thank you for your selecting our Profibus-DP option.
This instruction includes how to use the product and the instruction during handling.
Your wrong handling of this product may cause damage and then it reduces the duration of the product.
Therefore, please read this instruction carefully and then observes the instruction without fail.

1. Summary

1.1 Introduction
You can connect SV-iS7 inverter to Profibus network using Profibus option.
With Profibus option board built in, inverter control and monitoring by PLC sequence program or optional master module are available.
As a number of inverters in connection operate through one communication line only,
It reduces the installation cost compared with communication being unused.
Furthermore, its simple wiring enables the reduction of installation time and easy maintenance and repair.

1.2 Construction of Product
Profibus option, (1) 9-Pin Connector, Fixing Screw (M3), Manual

2. Product Specification

1.1.   Basic Communication Specification of Profibus Option

- Device Type : Profibus DP Slave
- Auto Baud Rate Detect : Support
- Sync Mode : Support
- Freeze Mode : Support
- Max Input Length : 8 words
- Max Output Length : 8 words
- Max Data Length : 16 words
- Baud Rate Support : 9.6K, 19.2K, 93.75K, 187.5K, 500K, 1.5M, 3M, 6M, 12M
- Modular Station : Support
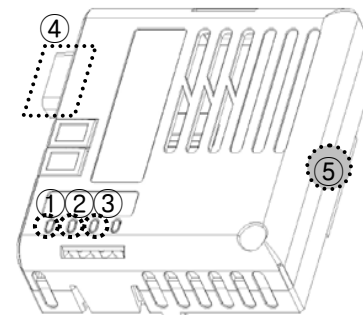- Max Module : 2

3. Appearance and Name of Each Part

Figure 1. Exterior Appearance

● LED Display

No.	Name	Application
①	DATA_EX LED	Always "On" when Profibus is Online status.
②	ERROR LED	"On" when error occurs in the option
③	CPU LED	"On" when the option board is built in the inverter and power is supplied to the inverter
④	Communication connecting Terminal	Terminal that connects it with Profibus communication
⑤	Inverter connecting Connector	Terminal that connects it with inverter body

※ For further operation, please refer to '7. Troubleshooting'.

● Communication Line Connecting Terminal

Pin No.	Signal	Description
1	Shield	Protective Ground Line
2	M24	24V Output GND
3	RxD/TxD-P	Send/Receive Data Plus
4	CTRL-P	Control Signal for Repeater
5	DGND	Signal GND
6	VP	5V for Terminating Resistance
7	P24	24V Output Plus
8	RxD/TxD-N	Send/Receive Data Negative
9	CTRL-N	Control Signal for Repeater

Note) This product supports the signal Nos. 3,5,6,8 only.

4. Option Installation Method

4.1 How to install option to inverter
1) Power off.
2) Connect connector after isolating front cover from iS7 as shown in Figure below.
3) Fix by enclosed volt.
4) Power On and Check "Profibus" at parameter, "CNF 31: Option-1 Type".
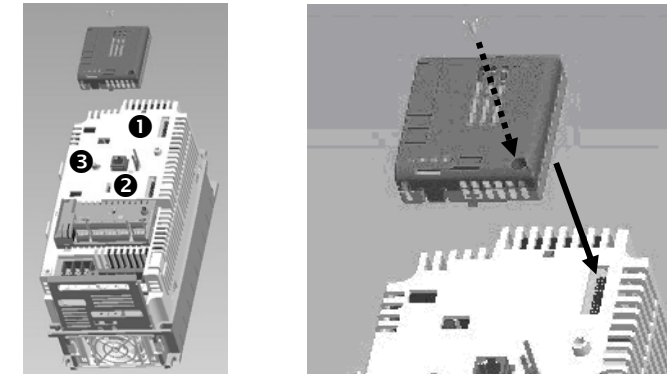
⚠ Caution

- **Cut off the power when remove the option, it may cause electric shock or break down.**

NOTE
1) iS7 has 3 option connectors, they are located in front upper, lower and left side: Option ❶ ❷ ❸ at the Figure.
2) Profibus must be connected with Option ❶

5. Profibus Parameter

5.1 Station Address Setting

	Minimum Value	Max. Value	Position on Keypad
Field Bus ID	0	125	No. 7 of COM Group

※ Station address is a peculiar value distinguishing each node in the Profibus Network, and therefore each different device cannot jointly possess the same value. Station address can be changed through Keypad manipulation. Default value set from the factory is 1.

5.2 Number of Status Data Setting
Determines the number of output data (Variable to be monitored out of the inverter variables)

	Minimum Value	Max. Value	Position on Keypad
Para Status Num	0	8	No. 30 of COM Group

5.3 Number of Control Data Setting
Determines the number of input data (Variable to be commanded from outside among the inverter variables)

	Minimum Value	Max. Value	Position on Keypad
Para Ctrl Num	0	8	No. 50 of COM Group

5.4 Address of Output Data Setting
Determines the address setting in the number of data to be output.

	Minimum Value	Max. Value	Position on Keypad
Para Status 1~8	0h0000	0hFFFF	Nos. 31~38 of COM Group

5.5 Address of Input Data Setting
Determines the address setting in the number of data to be input.

	Minimum Value	Max. Value	Position on Keypad
Para Ctrl 1~8	0h0000	0hFFFF	Nos. 51~58 of COM Group

5.6 I/O Data Send/Receive
Output data set in the keypad of the inverter is transmitted to Profibus Master Module (Control Program of PLC or PC) through Profibus Option Module. On the contrary, the control data is transmitted from Profibus Master Module (Control Program of PLC or PC) to Profibus Option Module, which is sent from Profibus Option Module to the inverter.

6. Basic Feature

When turning on the inverter power or when reset occurs;
- CPU LED flashes if power supply is in normal state.
- ERR LED is On if power supply is in abnormal state.
- Conduct configuration using the keypad.
- If the communication with the Master Station as configured, Profibus communication status DATA_EX LED is Off.

7. Unusual Operation and Measures

The status of device and network is displayed through three (3) LED (DATA_EX, ERR, CPU) lights located at the lower part of the Product. The current status can be checked through the display of LED.

7.1 DATA_EX LED Operation and Measures against Error

| LED	Status	Cause	Help
Off	Off-Line	When Master fails to start communication	Master starts communication.
		Wrong wiring of Connector	Check for the wiring of pin number and terminating resistance of the connector.
		No master inside the current network	No master allotted or problem of master station.
		Station Address Error	Check if the station address allotted to the Profibus-use option module of LS inverter is same as that designated by keypad in the tool configured, and it is only one in the network.
		Network Config. Problem.	Check if it exceeds the max. length of the segment. Check if 32 or more stations including repeater are connected with the segment. Check if 126 or more stations including repeater are connected with the network.
On	On-Line Status	Network, Station Address, Parameterization, Configuration are all in normal condition	

7.2 CPU LED Operation and Measures against Error

LED	Status	Cause	Help
Off	Power Supply Defect	inverter power supply defect/Defect of Contact between inverter and option	Check for the condition of inverter power supply. Check for error of inverter. Check for the contact between inverter and connector.
Flashing with 1 sec. interval	Normal	Normal Operation	

7.3 Error LED Operation and Measures against Error

| LED	Status	Cause	Help
Off	Normal	Normal Operation	
Flashing with 1 sec. interval	Inverter ~ option communication Error	Communication between inverter and option is not available	Check for abnormal connection between option and inverter. ※ It flashes like CPU LED.
Flashing with approx. 1 sec. interval	CONFIG ERROR	When On line status is different in the Master, if configurations of Master and Profibus option are different each other.	Check if the config. info. of inverter set in Master corresponds with that inside the inverter. ※ Configured Data: Number of Status Data and Control Data. ※ It flashes contrary to CPU LED.

8. Construction of System & Transmission Specification

8.1 Installation of Terminating Resistance and its Specification
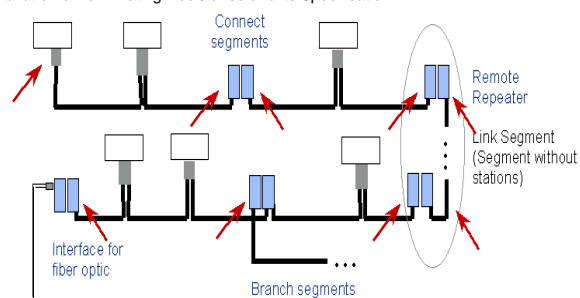
Max. Number Repeater Cascading: 9

Termination "on"

+5V (6) ——— 390Ω
A-Line (3) ——— 220Ω
B-Line (8) ———
GND (5) ——— 390Ω
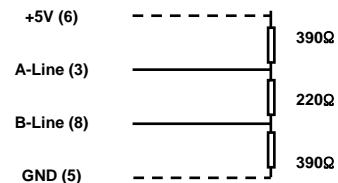
8.2 Max. Transmitting Distance Specification

| Communication Speed(Kbps)	Max. Segment Length	Max. Extended Distance
9.60	1000 m / 3278 feet	10000 m / 32786 feet
19.20	1000 m / 3278 feet	10000 m / 32786 feet
93.75	1000 m / 3278 feet	10000 m / 32786 feet
187.50	1000 m / 3278 feet	10000 m / 32786 feet
500.00	400 m / 1311 feet	4000 m / 13114 feet
1500.00	200 m / 655 feet	2000 m / 6557 feet
3000.00	100 m / 327 feet	1000 m / 3278 feet
6000.00	100 m / 327 feet	1000 m / 3278 feet
12000.00	100 m / 327 feet	1000 m / 3278 feet

9. Environment Configuration & Other Functions

9.1 GSD Files (Electronic Data Sheets)
This is the file including the information of inverter Profibus Option Module.
This file is required in the Profibus Configuration Software. Be sure to use iS7-use GSD file.
The relevant file can be downloaded from the homepage of LS Industrial Systems Co., Ltd. (http://www.lsis.biz).

▶ GSD File Name : LSIS0A6C.GSD
▶ Version : 2.00
▶ ICON File Name
  Stop Icon : LSIS_INV_S.DIB
  Run Icon : LSIS_INV_R.DIB
  Diagnostic Icon : LSIS_INV_D.DIB
▶ It doesn't support from Module = "9 Word Status Input Data" 0h58 to Module = "16 Word Status Input Data", and from Module = "9 Word Control Output Data" 0h68 to Module = "16 Word Control Output Data" 0h6F.

You may attach LSIS0A6C.GSD to the folder where GSD file is stored in Master Configuration program, and attach ICON files to the ICON storage folder.

SyCon
　Fieldbus
　　DevNet
　　PROFIBUS
　　　BMP
　　　Firmware
　　　GSD
　　　Script
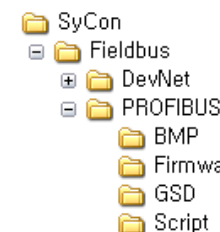
Ex) In case it is Sycon used in XGT; Here, you may attach LSIS0A6C.GSD to GSD under the PROFIBUS folder, and then attach ICON files to BMP.

9.2 User Parameter Setting
You may set Profibus-use User Parameter including Cycon in Profibus Master.
1). Data Word Format
Inverter data is word, which is sent divided into byte at the time of data transmission.
At this time, whether transmitting to MSB-LSB or to LSB-MSB will be elected.
Initial value is MSB-LSB.

2). Config Data Update
Decide if forcing to set the number of inverter I/O data compulsorily by the Master, or generating the Configuration Error.
Selection is to be made out of Disable and Enable. If Enable is selected, the set value of master is forced to be set in the inverter.
At this time, the initial value is Disable. If the number of I/O data set in the inverter doesn't corresponds with that set in the Master,
Config Err occurs. This is the useful function when testing the communication with the inverter under Enable status.

9.3 Extended Diagnostic
As the safety-related function, it generates diagnostic in the master when trip occurs in inverter or option.
There are 5 defined extended diagnostics as follows:

1). Cannot connect between Main and Option: Defect of communication between inverter and option
2). Inverter H/W Diag Trip: When hardware diagnostic trip occurs in the inverter
3). Inverter Latch Type Trip: When trip in latch type occurs
4). Inverter Level Type Trip: When trip in level type occurs
5). Inverter Warning: When warning occurs

10. Communication Parameter

10.1 Map Structure of Whole Communication Parameter in European Style

Category	Address	Type of Parameter
iS5 Series Compatible Common Category	0h0000~0h00FF	
Parameter Registered Type Category	0h0100~0h01FF	Parameter registered on COM Grp
	0h0200~0h023F	Parameter registered on Usr Grp
	0h0240~0h027F	Parameter registered on Macro Grp
	0h0280~0h02FF	Reserved
European Common Category	0h0300~0h037F	Inverter State (Read Only) Parameter
	0h0380~0h03FF	Inverter Control (Read/Write) Parameter
	0h0400~0h0FFF	Reserved
KeyPad Parameter Category	0h1000	MAK Grp
	0h1100	DRV Grp
	0h1200	BAS Grp
	0h1300	ADV Grp
	0h1400	CON Grp
	0h1500	IN Grp
	0h1600	OUT Grp
	0h1700	COM Grp
	0h1800	APP Grp
	0h1900	AUT Grp
	0h1A00	APO Grp
	0h1B00	PRT Grp
	0h1C00	M2 Grp

10.2 Parameter Group for Periodical Transmission
Parameter Group that can make Communication using the Address registered in Communication Function Group (COM)
0h100 ~ 0h107: Inverter Status Parameter registered on Status Para # of KeyPad Parameter COM Group
0h110 ~ 0h117: Inverter Control Parameter registered on Control Para # of KeyPad Parameter COM Group
All other categories (0h108 ~ 0h10F, 0h117 ~ 0h1FF) are invalid addresses.

Address	Parameter	R/W	Value Allotted by Bit
0h0100	Status Parameter #1	R	Parameter value registered on COM-31
0h0101	Status Parameter #2	R	Parameter value registered on COM-32
0h0102	Status Parameter #3	R	Parameter value registered on COM-33
0h0103	Status Parameter #4	R	Parameter value registered on COM-34
0h0104	Status Parameter #5	R	Parameter value registered on COM-35
0h0105	Status Parameter #6	R	Parameter value registered on COM-36
0h0106	Status Parameter #7	R	Parameter value registered on COM-37
0h0107	Status Parameter #8	R	Parameter value registered on COM-38
0h108~0h10F	Invalid address		Category not used
0h0110	Control Parameter #1	R/W	Parameter value registered on COM-51
0h0111	Control Parameter #2	R/W	Parameter value registered on COM-52
0h0112	Control Parameter #3	R/W	Parameter value registered on COM-53
0h0113	Control Parameter #4	R/W	Parameter value registered on COM-54
0h0114	Control Parameter #5	R/W	Parameter value registered on COM-55
0h0115	Control Parameter #6	R/W	Parameter value registered on COM-56
0h0116	Control Parameter #7	R/W	Parameter value registered on COM-57
0h0117	Control Parameter #8	R/W	Parameter value registered on COM-58
0h118~0h1FF	Invalid address		Category not used

10.3 Parameter Group for User & Macro Grp Transmission
0h200 ~ 0h23F: User Grp Parameter Currently Registered

Address	Parameter	Value Allotted by Bit
0h0200	User Grp. Code 1	Parameter value registered on U&M>USR->1
0h0201	User Grp. Code 2	Parameter value registered on U&M>USR->2
0h0202	User Grp. Code 3	Parameter value registered on U&M>USR->3
0h0203	User Grp. Code 4	Parameter value registered on U&M>USR->4
.	.	.
0h023C	User Grp. Code 61	Parameter value registered on U&M>USR->61
0h023D	User Grp. Code 62	Parameter value registered on U&M>USR->62
0h023E	User Grp. Code 63	Parameter value registered on U&M>USR->63
0h023F	User Grp. Code 64	Parameter value registered on U&M>USR->64

* In case of accessing the code not registered on User Grp, return to "Illegal data address"
Error Code "02".

10.4 0h240 ~ 0h27F: Macro Grp Parameter Currently Configured

| Address	Parameter	Value Allotted by Bit
0h0240	Macro Grp. Code 1	Parameter value registered on U&M>MC->1
0h0241	Macro Grp. Code 2	Parameter value registered on U&M>MC->2
0h0242	Macro Grp. Code 3	Parameter value registered on U&M>MC->3
0h0243	Macro Grp. Code 4	Parameter value registered on U&M>MC->4
.	.	.
0h024C	Macro Grp. Code 61	Parameter value registered on U&M>MC->61
0h024D	Macro Grp. Code 62	Parameter value registered on U&M>MC->62
0h024E	Macro Grp. Code 63	Parameter value registered on U&M>MC->63
0h024F	Macro Grp. Code 64	Parameter value registered on U&M>MC->64

* In case of accessing the code not smaller than the size of macro currently configured, return to "Illegal data address" Error Code "02".

> **Note**
> 1) For further inverter address and function, please refer to 'Communication Function', Section 11 in iS7 Main Body Manual.

11. Product Size
※ Option Size

22.5mm
69mm
93mm
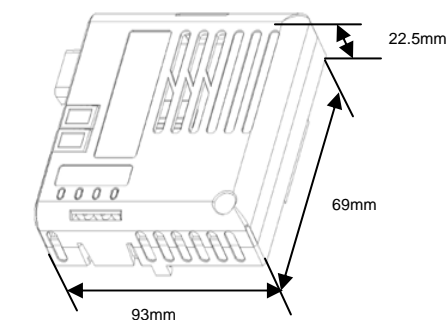
12. Warranty

12.1 Warranty Service Period
Warranty period is 18 months after manufactured.

12.2 Range of Warranty
If the defective part has been identified under normal and proper use within the guarantee term, contact your local authorized LS distributor or LS service center. But the guarantee will not apply in the following cases, even if the guarantee term has not expired.

● Damage was caused by misuse, negligence or accident.
● Damage was caused by abnormal voltage and peripheral devices' malfunction (failure).
● Damage was caused by improper repair or altering by other than LS authorized distributor or service center.
● Damage was caused by an earthquake, fire, flooding, lightning, or other natural calamities.
● When LS nameplate is not attached.
● When the warranty period has expired.

12.3 Please considerate it's stability when apply this option with the system.