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iS7 Profibus User Manual

SV-iS7 Series

User's Manual

Safety Instructions

- Use this board after read Safety Instruction of this manual carefully before using and follow the instructions exactly.
- Please hand this user manual to end user and trouble shooting manager
- After read this manual, keep it at handy for future reference.

- 사용 전에 '안전상의 주의사항'을 반드시 읽고 정확하게 사용하여 주십시오.
- 본 설명서는 제품을 사용하는 사람이 항상 볼 수 있는 곳에 잘 보관하십시오.

LS ELECTRIC

Before using the product
First of all, thank you for using our Profibus communication board.

SAFETY PRECAUTIONS

- Always follow safety instructions to prevent accidents and potentially hazardous situations.
- Safety precautions are classified into “WARNING” and “CAUTION,” and their meanings are as follows:

> ⚠ Warning
>
> Indicates a potentially hazardous situation which, if not avoided, may cause death or serious injury.

> ⓘ Caution
>
> Indicates a potentially hazardous situation, which, if not avoided, may cause minor injury or damage to the product.

- Symbols used in this document and on the product indicate the following:

> ⚠ Read and follow the instructions carefully to avoid dangerous situations.

> ⚠ Presence of dangerous voltage inside the product that may cause harm or electric shock.

- Keep the operating instructions handy for quick reference.
- Read the user manual carefully to fully and safely use the functions of the Profibus communication board.

> ⓘ Caution
>
> - **Be careful not to damage the CMOS elements on the communication board.** Static charge may cause malfunctioning of the product.
> - **Turn off the inverter before connecting communication cables.** Otherwise, the module may be damaged or a communication error may result.
> - **Correctly align the communication board to the installation connector for installation and make sure that it is firmly connected to the inverter.** Otherwise, the module may be damaged or a communication error may result.
> - **Check the parameter units when configuring the parameter values.** Otherwise, a communication error may result.

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1 Overview

1.1 Introduction

You can use the Profibus option to connect the SV-iS7 inverter to the Profibus network.

Using the Profibus communication board, the sequence program on the PLC or any Master Module can control and monitor the inverter.

Because multiple inverters can be operated with one communication cable, this reduces the total installation cost. In addition, installation time is reduced and easy maintenance is made available because installation and routing of cables has become simpler.

1.2 Package Content

Profibus option, 9-pin connector 1 ea., securing screw (M3), and manual

2 Product Specification

2.1 Basic Communication Specifications for the Profibus Option

- Device Type: Profibus DP Slave
- DP Version: DPV1
- Auto Baud Rate Detect: Supported
- Sync Mode: Supported
- Freeze Mode: Supported
- Max Input Length: 8 words
- Max Output Length: 8 words
- Max Data Length: 16 words
- Baud Rate Support: 9.6K, 19.2K, 45.45K, 93.75K, 187.5K, 500K, 1.5M, 3M, 6M, 12M
- Modular Station: Supported
- Max Module: 2
- Connectable Device:Up to 32 stations per segment

Items		Description	
DP version		DPV0(Legacy)	DPV1
function	Cyclic data MS0	Cyclical Data Exchange	Cyclical Data Exchange
		Global Control Service	Global Control Service
		Read Configuration Data	Read Configuration Data
		Read Diagnostic Data	Read Diagnostic Data
		Send Parameter Data	Send Parameter Data
		Configuration Data	Configuration Data
	Acyclic data MS1	x	Read, Write, Alarm
	Acyclic data MS2	x	Read, Write
Profile		I/O Profile (LS Define Profile)	I/O Profile(LS Define Profile), PROFIdrive profile, LS Drive Profile
Telegram		x	ST1, PPO Type
PNU Parameter		x	918 - PROFIBUS address
			922 - Telegram selection

Items	Description	
		944 - Error message counter
		947 - Error number
		963 - PROFIBUS baud rate
		964 - Device identification
		965 - PROFIdrive profile number
		972 - Drive unit reset
Integration	GSD_Revision = 1	GSD_Revision = 5 ,
		I&M0
Support Model Criteria	Ver. 2.01 or below	ver 3.00

Existing legacy versions of ver. 2.01 and earlier support DPV0 mode only. The mode only supports simple Input/Output communication and does not support additional protocol services, except for services for basic connection setup.

Starting with the newly supported version 3.00, DPV0/DPV1 mode is supported, and Telegram, PNU parameters, and profiles for drive control are added.

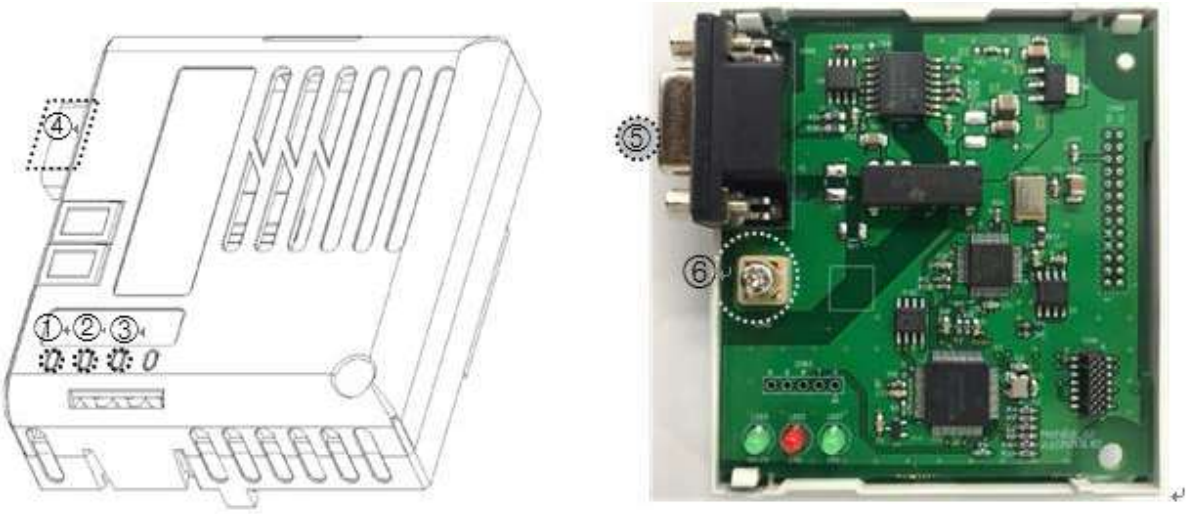
See the LS ELECTRIC homepage below for more information on Ver 2.01.

www.ls-electric.com -> Download Center -> iS7 Profibus Option Manual

The DP versions supported by LS Profibus-DP Master module are as follows:

Items		Description	Remark
XGK/XGI/XGR Common	XGL-PMEA	Profibus-DP Master	Supports DP-V0
	XGL-PMEC	Profibus-DP Master	
	XGL-PMEB	Profibus-DP Master	Supports DP-V0 and DP-V1

3 Appearance and Part Name

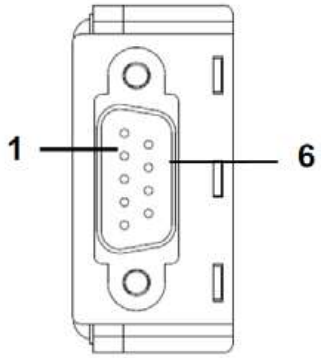


Display LED

No.	Name	Usage
①	DATA_EX LED	Always on when Profibus is online.
②	ERROR LED	Illuminates when an option or body malfunctions.
③	CPU LED	Illuminates when power is supplied to the inverter after installing the communication board to the inverter.
④	Communication connection terminal	Terminal for the Profibus communication connection.
⑤	Inverter connection connector	The connection terminal to the inverter body.
⑥	Ground Terminal	Terminal for ground wire connection in case of communication error due to noise.

※ See '7. Abnormal Operation and Countermeasures' for detailed operation.

Communication network terminals

PROFIBUS Connector	Pin	Signal	Description
	1	None	None
	2	M24	24 V Output GND
	3	RxD/TxD-P	Received/Transmitted Data Plus
	4	CTRL-P	Control signal for a repeater
	5	DGND	Signal GND
	6	VP	5 V for termination resistance
	7	P24	24 V Output - Positive
	8	RxD/TxD-N	Received/Transmitted Data - Negative
	9	CTRL-N	Control signal for a repeater

Note) The product only supports signal pins 3, 5, 6, and 8.

4 How to fit option

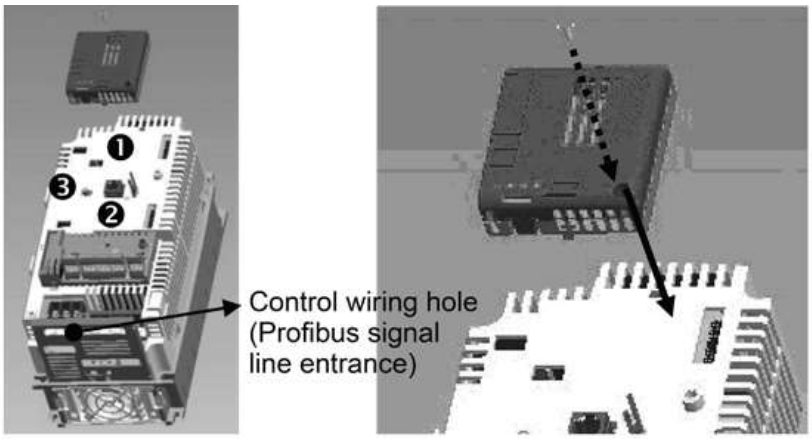
4.1 Mounting option to the inverter body

1 Turn off the power.

2 Remove the front cover of the iS7 and connect the connector as shown below.

3 Secure it to the main body using the included screw.

4 Power on the inverter and verify that Profibus is recognized in "CNF 31: Option-1 Type".



Caution

- **Be sure to disconnect the inverter power when installing and removing communication board.**
  It can cause electric shock and failure.

Note

1 The iS7 has three optional connectors located on the upper front, lower front, and left. Each is separated by an option ❶ ❷ ❸ as shown in the figure above.

2 For Profibus option, connect to the option ❶ connector for use.

3 Insert the Profibus signal line into the control wiring hole first and then wire the connection connector.

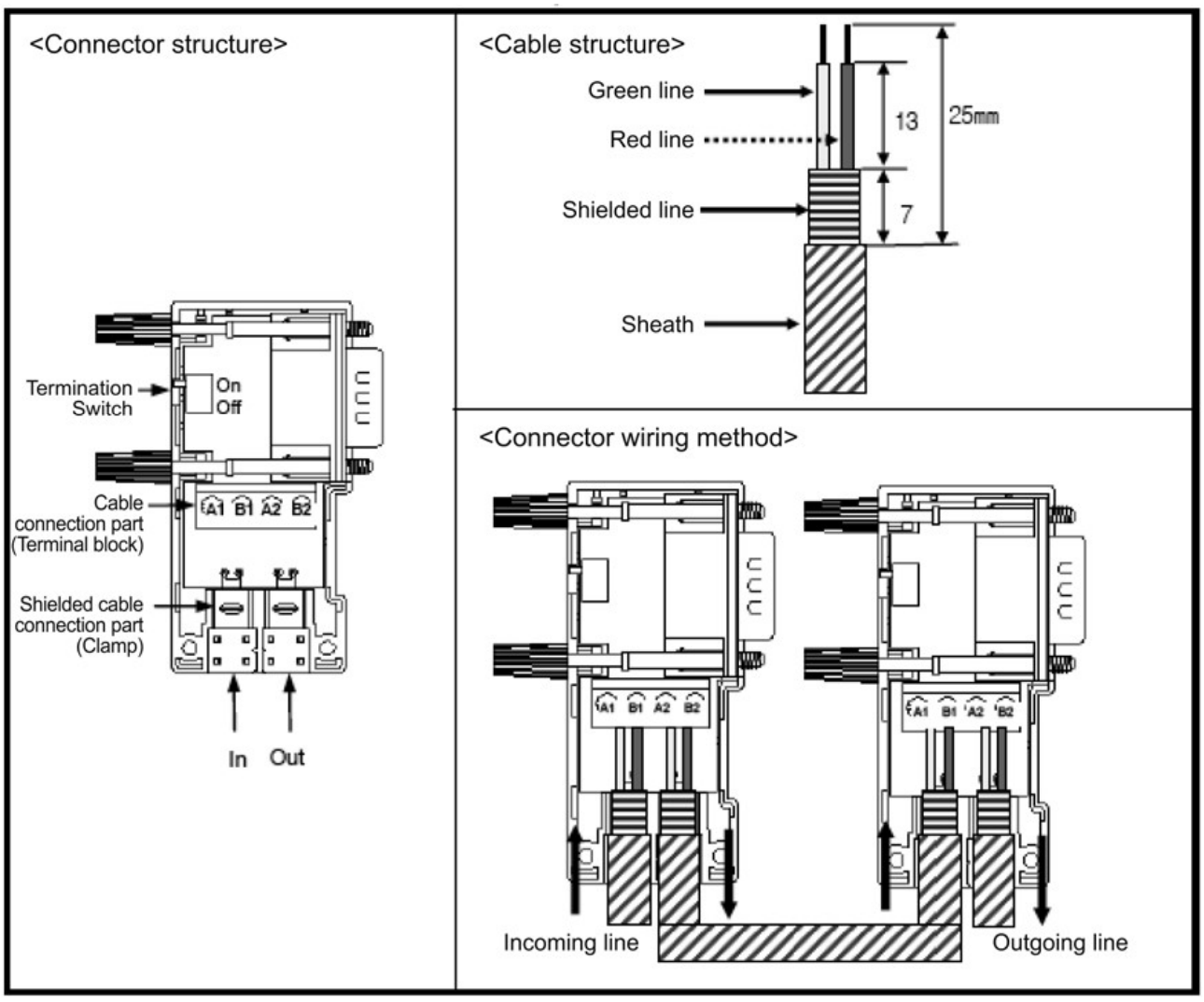
4.2 Structure of Profibus signal line connector and connector connection method

1 Incoming line: Connect the green line to A1 and red to B1.

2 Outgoing line: Connect the green line to A2 and red to B2.

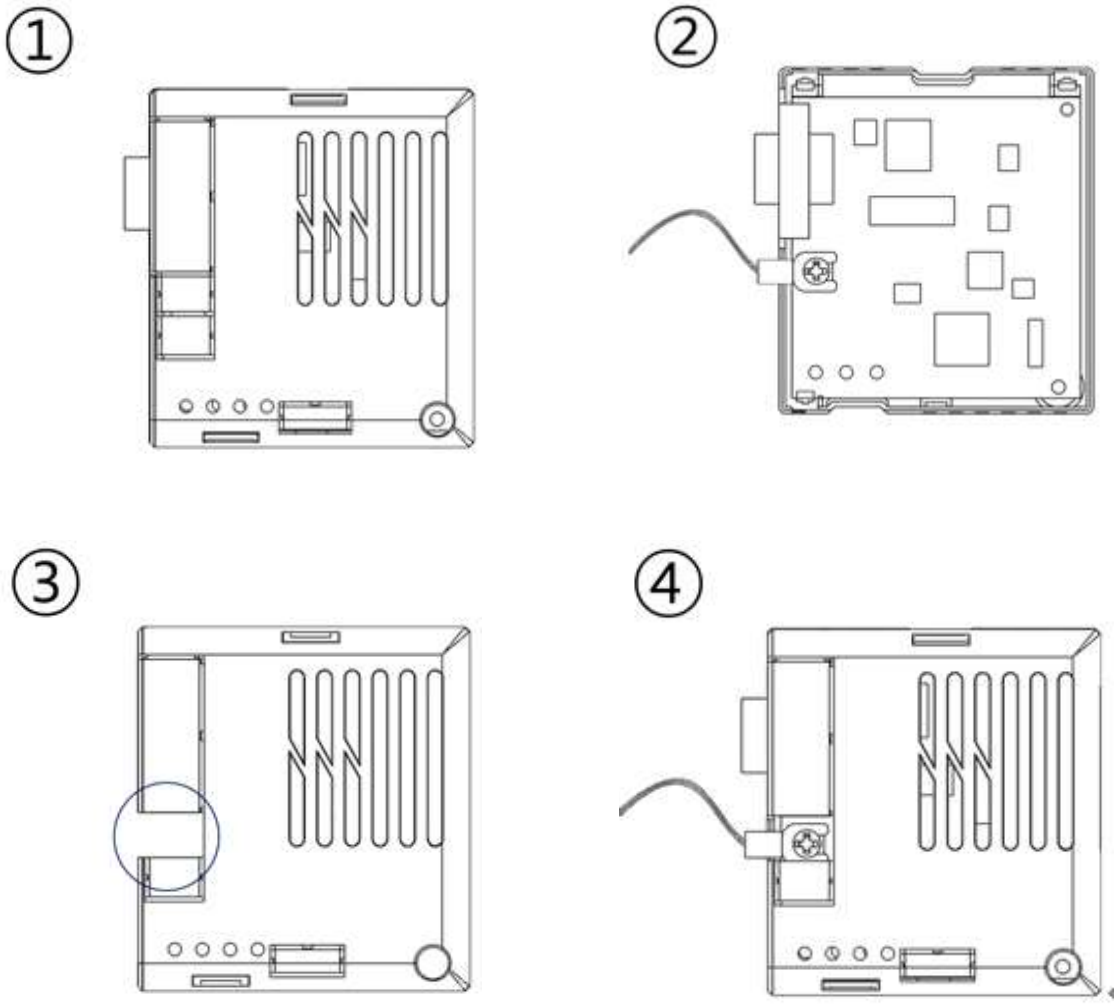
3 Connect the shield to the clamp on the connector.

4 When installing the connector on the end, install the cables on A1 and B1.



4.3 Grounding option

When using a ground on a communication cable (shielded cable), connect as follows. The ground cable is not included in the product package.



1 Remove the communication option cover.

2 Connect the ground wire using the *screw to the left of the communication option.

3 Remove the communication option cover if it is difficult to handle the lines on the ground wire.

4 Close and engage the communication Option cover.

Connect the ground of the communication option separately from the ground (CM) of the inverter

* See Ground part.

Screw size	Lug type		Recommended wiring thickness [mm2](AWG)	Screw torque [kgf.cm]
M3x6	Circular or Y-type		Complies with lug specification	5.3

5 Profibus parameters

5.1 Setting station address

	Minimum value	Maximum value	Location on KeyPad
Field Bus ID	1	125	07 in COM Group

※ The station address is a unique value that distinguishes each node in the Profibus network. Therefore, other devices cannot share the same value. You can change the station address by manipulating the keypad. The factory default is 1.

5.2 Setting the number of status data

Determines the number of output data (variables in the inverter to monitor)

	Minimum value	Maximum value	Location on KeyPad
Para Status Num	0	8	30 in COM Group

5.3 Setting the number of the control data

Determines the number of input data (variables in the inverter to be commanded externally).

	Minimum value	Maximum value	Location on KeyPad
Para Ctrl Num	0	8	50 in COM Group

5.4 Setting address for the output data

Sets the address as many times as the number of data to output.

	Minimum value	Maximum value	Location on KeyPad
Para Status 1~8	0h0000	0hFFFF	31-38 in COM Group

5.5 Setting address for the input data

Sets the address as many times as the number of data to input.

	Minimum value	Maximum value	Location on KeyPad
Para Ctrl 1~8	0h0000	0hFFFF	51-58 in COM Group

5.6 Transmitting and receiving I/O data

The status data set on the keypad of the inverter is passed to the Profibus Master Module (PLC or PC control program) via the Profibus option Module. On the contrary, control data is passed from the Profibus Master Module (PLC or PC control program) to the Profibus option Module and from the Profibus option Module to the inverter.

5.7 Setting Profibus Bit Swap

You can set whether the LSB and MSB bits in the data transmitted during network communication will be swapped.

(This setting is required if the upper-level controller has an interface that reads the LSB and MSB data from the PROFIBUS communication module in a reverse order.)

	Setting	Keypad Parameter Number
FBus Swap Sel	0 : No 1 : Yes	COM-68 (Parameter 68 in COM Group)

5.8 Profibus DP Telegram Type

Displays the Telegram type set in the communication module. These parameters cannot be changed on the keypad and can only be changed on the master. Indicates the I/O configuration of the cyclic message to and from the master, and the meaning of each value is as follows:

	Display value	Value meaning
COM-10	1	Standard Telegram 1
	100	*Vender Specific Telegram
	101	PPO Type 1 (PKW 4/4 + PZD 2/2)
	102	PPO Type 2 (PKW 4/4 + PZD 6/6)
	103	PPO Type 3 (PZD 2/2)
	104	PPO Type 4 (PZD 6/6)
	105	PPO Type 5 (PKW 4/4 + PZD 10/10)
	106	PPO Type 6 (PZD 10/10)

* The I/O Word data size set in the Vendor Specific Telegram follows the Para Status Num and Para Control Num settings.

The values of Para Status Num (COM-30) and Para Control Num (COM-50) may be automatically changed according to the corresponding values determined by the Master.

5.9 Profibus DP Profile

Displays the control operation mode for inverter operation. These parameters cannot be changed on the keypad and can only be changed on the master. The control operation mode shows the operation mode status set by the master, and the meaning of each value is as follows:

	Set value	Value meaning	Remark
COM-11	0	I/O Profile	Telegram Type: Automatically specified when using 100.
	1	PROFIdrive Profile	Telegram Type: Automatically specified when using 1.
	2	LS Drive Profile	Telegram Type: Available when using 101-106.

5.10 Profibus DP Baudrate

Displays the Baudrate of the Profibus DP currently set by the Master. These parameters cannot be changed on the keypad and can only be changed on the master. Indicates the value specified when the Profibus DP is running on the Master, and the meaning of each value is as follows:

	Display value	Value Meaning
COM-12	0	9.6 kbit/s
	1	19.2 kbit/s
	2	93.75 kbit/s
	3	187.5 kbit/s
	4	500 kbit/s
	6	1.5 Mbit/s
	7	3 Mbit/s
	8	6 Mbit/s
	9	12 Mbit/s
	11	45.45 kbit/s
	255	Invalid baud rate

5.11 Profibus DP Module Reset

Parameter for initializing the PROFIdrive parameter value of the communication option to zero. As soon as the corresponding value is set to 1, the values of p944, p947, and p953 to be initialized are initialized to 0.

5.12 Profibus DP PROFIdrive Value

Parameter used when the value applied in the COM-11 Profibus DP Profile is set to PROFIdrive Profile (1). After changing to the keypad, the COM-94 Com update is required to apply the corresponding values. This parameter represents the definition of the value used in the Setpoint value, Actual speed value area.

	Set value	Value meaning	Remark
COM-14	0 (default)	PROFIdrive Standard	Indicates NSOLL_A, NIST_A (16 bits), and the reference point for that value is DRV-20 Max Freq. The range is 0xC000 (-100%) to 0x4000 (100%). Ex) DRV-20(60.00hz)* 0x4000(100%) = Forward Target Frequency Value(60.00hz) DRV-20(60.00hz)* 0xF000(-25%) = Reverse Target Frequency Value(15.00hz)
	1	Vendor Specification	Indicates the RPM (decimal) value itself.

6 Basic operation

When the inverter power is on or resets:

- The CPU LED blinks when power is turned on normally.
- The ERR LED turns on if there is something wrong.
- The configuration is performed through the keypad.
- The DATA_EX LED indicating the Profibus communication status turns on when communication with the Master station is started as set.

7 Abnormal operation and countermeasures

Three LEDs (DATA_EX, ERR, CPU) located at the bottom of the product display the status of the device and network. The display status of each LED shows the current status.

7.1 DATA_EX LED operation and countermeasures in case of malfunction

LED	Status	Cause	Measures
Off	Off-Line	If the Master does not start communication	Let the Master start communication.
		Connection abnormality on connector	Check the pin number of the connector for the correct orientation of the cable connection and check the termination resistor configuration.
		No master in current network.	A master device has not been assigned, or the master device's station ID has been set incorrectly.
		Station ID error	Using the configuration tool, verify that the station ID assigned to the option module for Profibus of the LS ELECTRIC inverter is the same as the station ID specified in the keypad and is the only one in the network.
		Problem exists in network configuration	Check if the network cable length of the segment exceeds the maximum allowed length. Check if the segment has over 32 stations (including a repeater). Check if the network has over 126 stations (including a repeater).
On	On-Line Status	Network, Station ID, parameterization, and configuration are all normal.	

7.2 CPU LED operation and countermeasures in case of malfunction

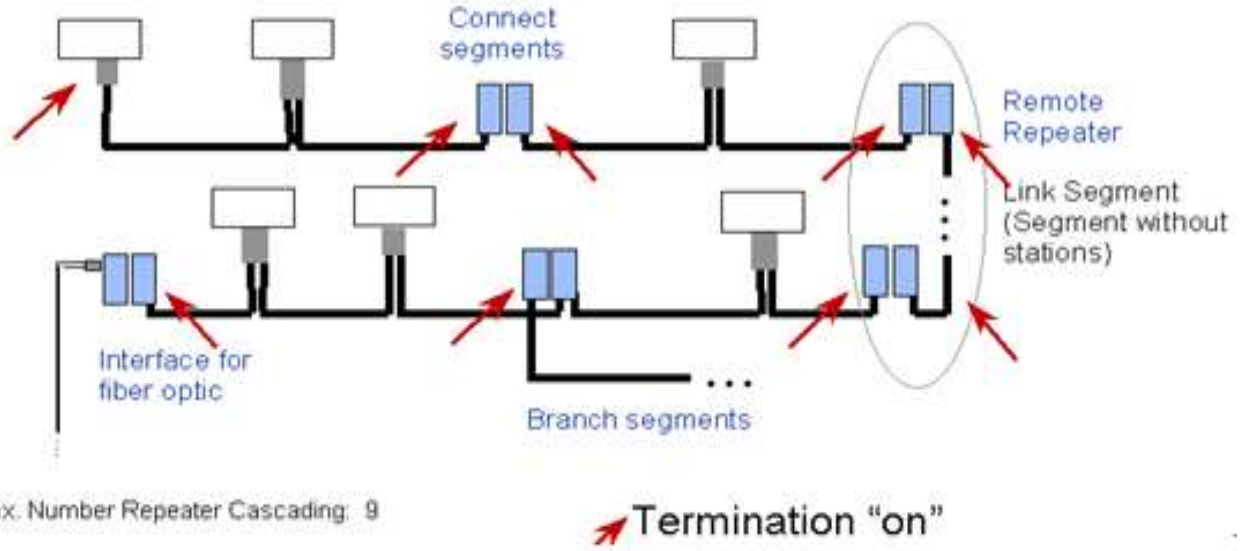
LED	Status	Cause	Measures
Off	Power supply failure	Poor power connection to inverter/poor contact between inverter and option	Check the power supply to the inverter. Check if the inverter has tripped. Check the connection of the connector to the inverter.
Flashes with 1-sec interval.	Normal	Normal operation.	

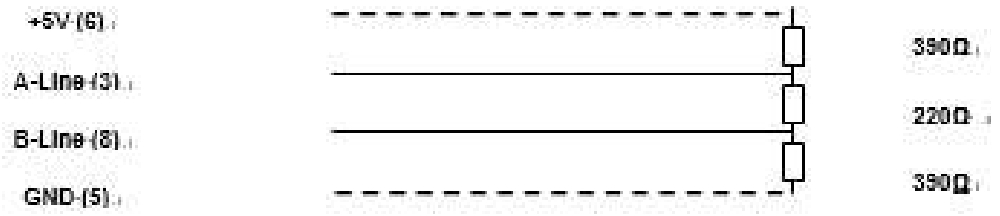
7.3 Error LED operation and countermeasures in case of malfunction

LED	Status	Cause	Measures
Off	Normal	Normal operation	
Flashes with 1-sec interval.	Communication error between inverter options	No communication between the inverter and the option.	Check the connection between the option and the inverter for abnormalities. ※ It blinks the same as the CPU LED.
Flashes at about 1-sec interval.	Setting error CONFIG ERROR	When the Master and Profibus option setting configurations are different when you are online on the Master	Check the configuration information of the inverter and within the inverter that is set on the Master. ※ Configuration Data: The number of status data and control data. ※ It flashes opposite to the CPU LED.
Single Flash 0.2s ON / 0.8s OFF	EEPROM error	Failed to read EEPROM data inside option immediately after power is applied	Contact our company's A/S.
Double Flash 0.2s ON /0.2s OFF /0.2s ON /0.4s OFF	LOST COMMAND	With the lost command set, the communication connection with the master failed	See help of "DATA_EX LED Off" status
ON	Fault occurred	Fault occurred from inverter	Check inverter fault History

8 System configuration and transmission specification

8.1 Methods and specifications for installing terminating resistance





8.2 Maximum transmission distance specification

Communication speed (Kbps)	Max. Segment Length	Max. Extension Length
9.60	1000 m / 3278 feet	10000 m / 32786 feet
19.20	1000 m / 3278 feet	10000 m / 32786 feet
45.45	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

*** Special requirements for using transmission rate greater than 1.5 Mbps**

- A special connector with a built-in inductor is required to use a transmission rate of 1.5 Mbps or higher.
- Spurline is not allowed when using a transmission rate greater than 1.5 Mbps.
- The maximum segment length is 100 m.
- The minimum cable length between each node must be greater than 1 m.

9 Preferences and Other Features

9.1 GSD files (Electronic Data Sheets)

A file containing information about the Profibus option Module of the inverter. Profibus

The configuration software requires this file. Be sure to use the GSD file for the iS7.

The file can be downloaded from the LS ELECTRIC homepage (http://www.ls-electric.com).

* Apply the GSD that matches the software version of the option module.

9.2 User Parameter Setting

You can set up a Profibus-only user parameter on the Profibus Master, including Sycon.

1). Data Word Format

The data of the inverter is Word, and when transmitting, the data is separated into bytes and transmitted.

At this point, whether to send to MSB-LSB or LSB-MSB is selected.

The initial value is MSB-LSB.

2). Config Data Update

In the Master, it is determined whether to force the number of input/output data of the inverter or to cause a configuration error. You can choose between Disable and Enable. When Enabled is selected, the Master's settings are forced on the inverter. The initial value is Disable. If the input/output data set in the inverter and the input/output data set in the master do not match, a configuration error will occur. It is a useful function to test communication with inverter by enabling communication test.

9.3 Extended Diagnostic

It is a safety-related function that generates diagnostic in the Master when an inverter trip or an optional trip occurs. There are currently five extended diagnostics defined:

1 Cannot Connect between the Main and the Option: Poor communication connection between inverter and option.

2 Inverter H/W Diag. Trip: Occurs when a hardware diagnostic trip occurs in the inverter.

3 Inverter Latch Type Trip: Occurs when a trip of the latch type occurs.

4 Inverter Level Type Trip: Occurs when a Level Type Trip occurs.

5 Inverter Warning: Occurs when warning occurs.

10 Communication Parameters

10.1 Map Structure of the iS7 Inverter full communication parameters

Area	Address	Parameter type
iS7 Series compatible Common Areas	0h0000~0h00FF	
Parameter registration type area	0h0100~0h01FF	Parameters registered with COM Grp
	0h0200~0h023F	Parameters registered with Usr Grp
	0h0240~0h027F	Parameters registered with Macro Grp
	0h0280~0h02FF	Reserved
iS7 Common Area	0h0300~0h037F	Inverter Status (Read Only) parameter
	0h0380~0h03FF	Inverter Control (Read/Write) Parameter
	0h0400~0h0FFF	Reserved
Keypad Parameter Area	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 Groups for Periodic Data Transmission

Communication can be performed using the address registered in the communication function group (COM).

0h100 to 0h107: Inverter status parameter registered in status para # in the keypad parameter COM group

0h110 to 0h117: Inverter control parameter registered in control para # in the keypad parameter COM group. The remaining regions (0h108 to 0h10F and 0h117 to 0h1FF) are invalid addresses.

Address	Parameter	R/W	Content assigned by Bit
0h0100	Status Paramter #1	R	Parameter values registered in COM-31
0h0101	Status Paramter #2	R	Parameter values registered in COM-32
0h0102	Status Paramter #3	R	Parameter values registered in COM-33
0h0103	Status Paramter #4	R	Parameter values registered in COM-34
0h0104	Status Paramter #5	R	Parameter values registered in COM-35
0h0105	Status Paramter #6	R	Parameter values registered in COM-36
0h0106	Status Paramter #7	R	Parameter values registered in COM-37
0h0107	Status Paramter #8	R	Parameter values registered in COM-38
0h108~0h10F	Invalid address		Unused area
0h0110	Control Paramter #1	R/W	Parameter values registered in COM-51
0h0111	Control Paramter #2	R/W	Parameter values registered in COM-52
0h0112	Control Paramter #3	R/W	Parameter values registered in COM-53
0h0113	Control Paramter #4	R/W	Parameter values registered in COM-54
0h0114	Control Paramter #5	R/W	Parameter values registered in COM-55
0h0115	Control Paramter #6	R/W	Parameter values registered in COM-56
0h0116	Control Paramter #7	R/W	Parameter values registered in COM-57
0h0117	Control Paramter #8	R/W	Parameter values registered in COM-58
0h118~0h1FF	Invalid address		Unused area

10.3 Parameter Groups for User and Macro Grp Transport

0h200 to 0h23F: User Grp parameter currently registered

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

* If you access a code that is not registered in the User Grp, it will return the illegal data address error code 02.

10.4 0h200 to 0h23F: User Grp parameter currently registered

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

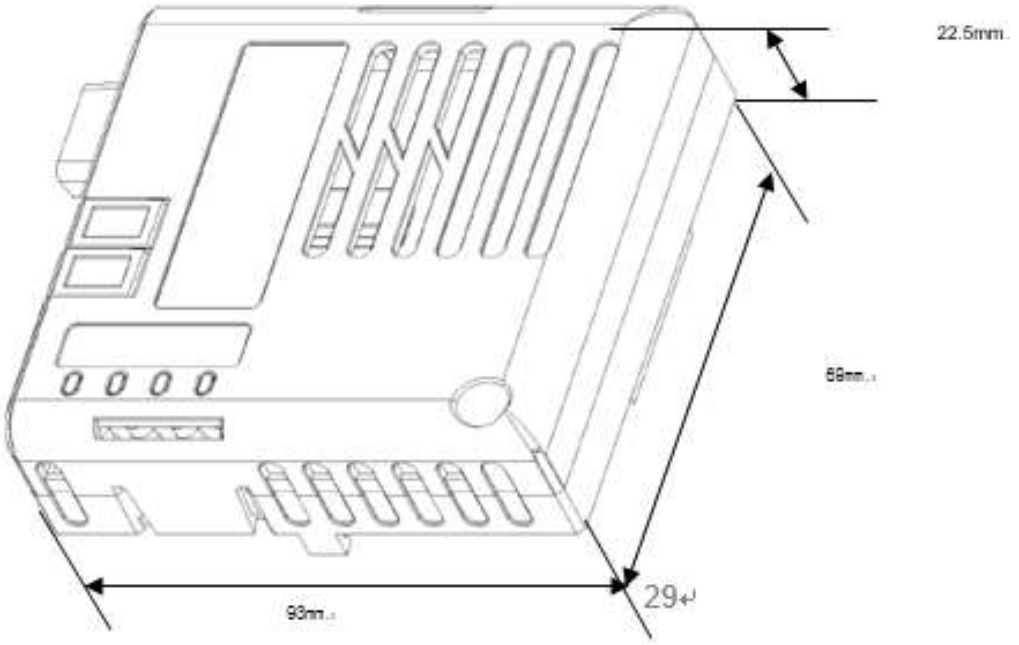
* If you access a code larger than the current macro size, it will return the Illegal data address error code 02.

Note

1) See iS7 Body Manual Chapter 11, Communication Functions, for detailed inverter communication addresses and functions.

11 Product Size

※ Option size



12 Communication Profile

The communication profile represents the procedure for control commands (i.e., control word, status word, references, and actual values, etc.) between the Master and the Slave (inverter). Data transmission between the PROFIBUS DP Master and the Slave is performed through the IN/OUT data field. The Master controls the data by recording it in the OUT data of the Slave (inverter), the Slave (inverter) responds by delivering the contents of the IN data to the Master.

This communication module supports I/O profile, PROFIdrive profile and LS Drive profile, and the meaning of input/output data varies depending on each profile.

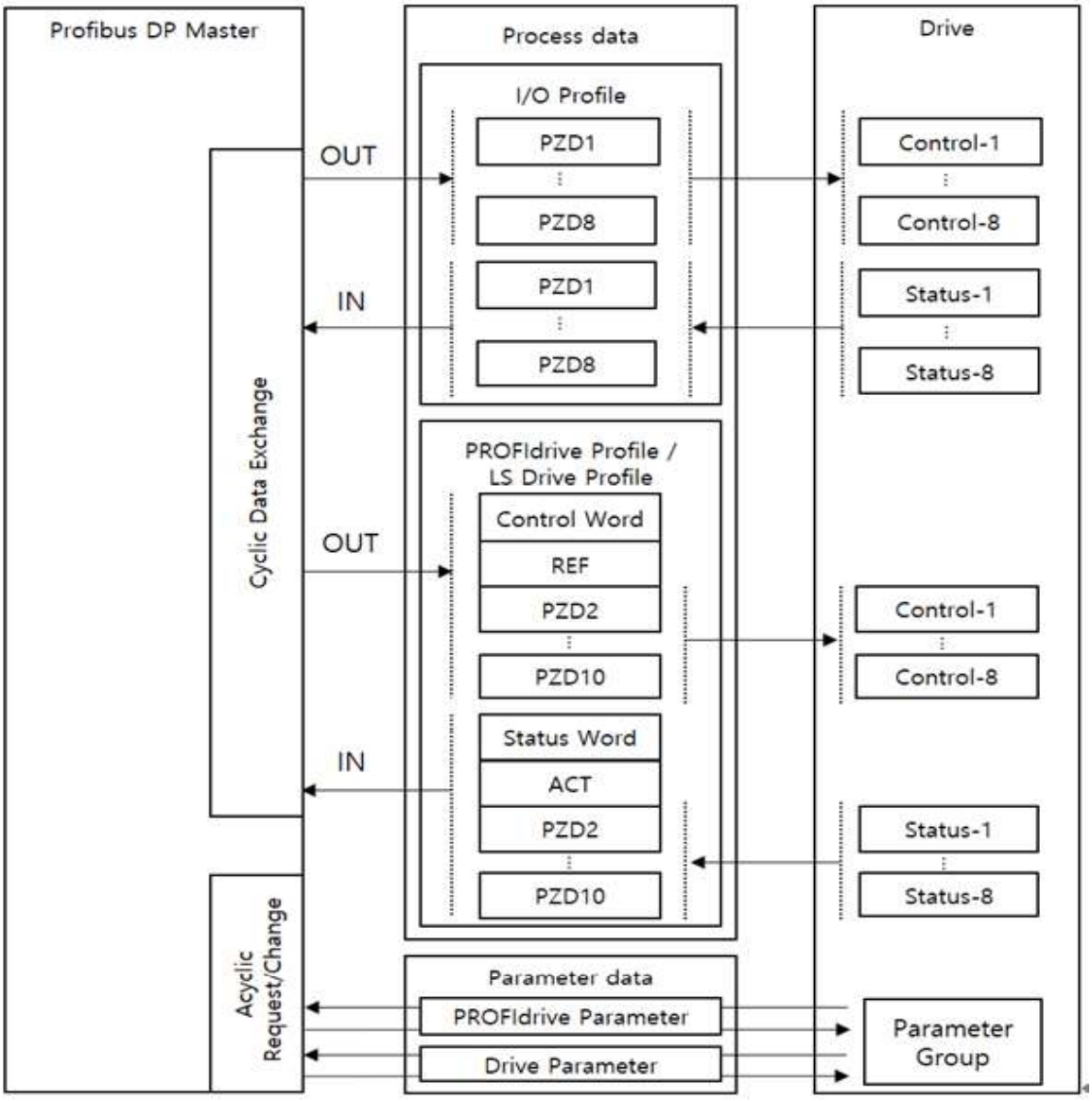


Figure 4. Data Transfer between PROFIBUS DP Master and Drive

The Profibus DP communication module can be used in combination of process data and parameter data, depending on the use of the profile and Telegram.

Process data

- Process data OUT : For controlling drive
- Process data IN : Is used for fast monitoring of the drive

Parameter data

- Used for Write/Read parameters and variables.
- Available only when the device is configured to use PPO1, PPO2, or PPO5.
- Also can be used with DP-V1 Function

Process data is divided into I/O profile, PROFI drive profile, and LS Drive profile depending on the profile usage. PROFIdrive profile and LS Drive profile are control profiles for the standardized speed control mode, and I/O profile is a method of accessing and controlling its parameters without the standardized control mode.

Parameter data is a service that periodically requests/responds to specific parameters. This service provides access to PROFIdrive parameters and the product's own drive parameters. Parameter access methods for parameter data are divided into cyclic parameter data transfer and acyclic parameter data transfer methods.

12.1 PROFIdrive Profile

According to the PROFIdrive Profile, the control word (PROFIdrive parameter 967) is used by the control system, and the status word (PROFIdrive parameter 968) indicates the status changed by the control word, etc. When using this PROFIdrive profile, it is not recommended to access control parameters, such as the operation of the inverter and the target frequency (0h0005, 0h000A, 0x0381, and 0x0015). For information on the status machine, see Figure 5.

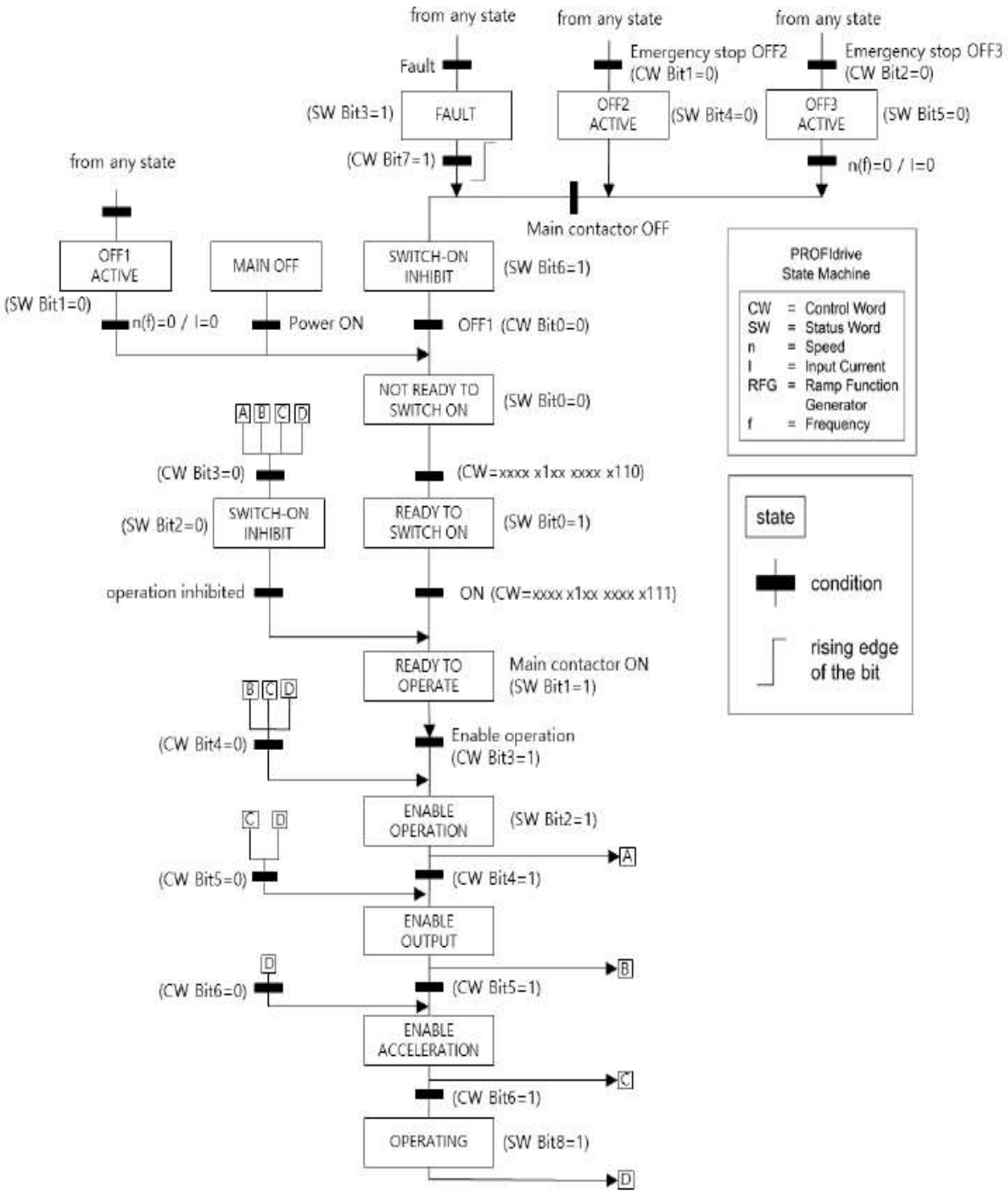


Figure 5. PROFIdrive State machine

The details of the control word and status word used in the status machine above are as follows:

12.1.1 Control word(STW1)

Bit	Name	Value	Description
0	ON	1	Ready to operate □ (Operational status by PLC)
	OFF1	0	NOT ready to operate □ (Inoperable condition by PLC)
1	No OFF2	1	Maintains the current operating condition.
	OFF2 (Free Run Stop)	0	Coast Stop: Stops the motor by Free Run Stop.
2	No OFF3	1	Maintains the current operating condition.
	OFF3	0	Stops driving the motor using the method set in Quick stop among the parameters of the inverter.
3	Enable Operation	1	Drives the motor using "Setpoint value" received from the PLC via Profibus DP communication.
	Disable Operation	0	Stops driving the motor in the manner set in ADV-8 Stop Mode among the parameters of the inverter.
4	Enable Ramp Generator	1	Refer to Acc Time and Dec Time of Drive Group (PAR->DRV) among the parameters of the inverter, accelerate/decelerate a certain amount of time to reach the motor command value ("Setpoint value").
	Reset Ramp Generator	0	Force the motor command value to 0 (the frequency decelerates to 0 Hz as set by Dec Time).
5	Unfreeze Ramp Generator	1	Without fixing the ramp generator operation, refer to acc time and dec time of drive group (PAR -> DRV) among the parameters of the inverter, accelerate/decelerate a certain amount of time to reach the motor command value ("Setpoint value").
	Freeze Ramp Generator	0	Through the Profibus DP, ignore the motor commands from the PLC entered, fix the ramp generator movement and operate the motor at the rotational frequency of the current motor.
6	Enable Setpoint	1	Operates the motor according to the motor command value of the PLC.
	Disable Setpoint	0	Forces the motor command value to zero.
7	Fault Acknowledge	(0 -> 1)	When changing from 0 to 1, turn off the fault of the inverter.
8	Jog1 ON/OFF	-	Not supported

Bit	Name	Value	Description
9	Jog2 ON/OFF	-	Not supported
10	Control By PLC	1	Controls the inverter using control word (STW1) received from the PLC via Profibus DP communication.
	No Control By PLC	0	Ignores the control word (STW1) received from the PLC via Profibus DP communication.
11 ~ 15	-	-	Reserved

12.1.2 Status word(ZSW1)

Bit	Name	Value	Description
0	RDY_ON	1	Ready To Switch ON □ (Operational status)
		0	Not Ready To Switch OFF□ (Inoperable status)
1	RDY_OPERATION	1	Indicates the bit 0 value of the currently entered control word (STW1).
		0	
2	OPERATION	1	Indicates the bit 3 value of the currently entered control word (STW1).
		0	
3	Fault Present	1	Indicates that a Fault exists in the inverter.
	No Fault	0	Indicates that no fault exists in the inverter.
4	No OFF2	1	Indicates the bit 1 value of the currently entered control word (STW1).
	OFF2	0	
5	No OFF3	1	Indicates the bit 2 value of the currently entered control word (STW1).
	OFF3	0	
6	SWC_ON_INHIB	1	Switching On inhibited (Out of control)
		0	Switching On Not inhibited (Controllable status)
7	Warning Present	1	Indicates that warning exists in the inverter.
	No Warning Present	0	Indicates that warning does not exist in the inverter.
8	Speed Error within tolerance	1	Indicates that the actual rotational frequency of the motor has been reached at the command frequency ("Setpoint value").

Bit	Name	Value	Description
	Speed Error out of tolerance	0	Indicates that the actual rotational frequency of the motor has not been reached at the command frequency ("Setpoint value").
9	Control Requested	1	Indicates the bit 10 value of the currently entered control word (STW1).
	No Control Requested	0	
10	ABOVE_LIMIT	-	Not Supported
11 to 15	-	-	Reserved

12.1.3 Setpoint value

Defined by the value set in 5.12 Profibus DP PROFIdrive value. This is essentially the area for determining the speed of the operation command.

If COM-14 is set to PROFIdrive Standard (0), within 0xC000 (-100%) to 0x4000 (100%), the target is set as a percentage of the target frequency relative to the reference point. The corresponding reference point is the DR-20 Max Frequency value.

If COM-14 is set to vendor specification (1), the unit is RPM and scale is 1. This applies the decimal value and if the value is negative, it means a reverse command.

Ex) If COM-14 is set to PROFIdrive Standard (0) and the DR-20 max frequency is set to 60 Hz, the inverter outputs 60 Hz when the setpoint value is 0xC000.

If COM-14 is set to PROFIdrive Standard (0) and the DR-20 max frequency is set to 400 Hz, the inverter outputs 400 Hz when the setpoint value is 0xC000.

When COM-14 is set to vendor specification (1), and the setpoint value is 0x04B0, the inverter outputs 1,200 RPM.

12.1.4 Actual speed value

Defined by the value set in 5.12 Profibus DP PROFIdrive value. This is essentially the area for determining the actual output rate.

This applies when COM-14 is set to PROFIdrive Standard (0), and outputs it as a percentage of the actual frequency relative to the reference point within 0xC000 (-100%) to 0x4000 (100%). The corresponding reference point is the DR-20 max frequency value.

If COM-14 is set to vendor specification (1), the unit is RPM and scale is 1. This applies the decimal value and if the value is negative, it means a reverse operation.

12.2 I/O Profile

Proceeds with the data exchange without applying a separate profile. PZD1-8 is set according to the parameter address value specified only in para control-1-8 and para status-1-8, and the number of words to and from the master during I/O configuration shall match the 5.2 Para Status Num and 5.3 Para Ctrl Num settings. Applies only when using the vendor-specific telegram (100). * See Figure 4 I/O profile.

12.3 LS Drive Profile

Standardization profile as defined by LS ELECTRIC. This is the profile used in the drive speed control mode, and the control/status can be checked by the control word and the status word. When using this LS drive profile, it is not recommended to access control parameters (0h0005, 0h000A), such as the operation of the inverter and the target frequency. . See Figure 6 for state machine.

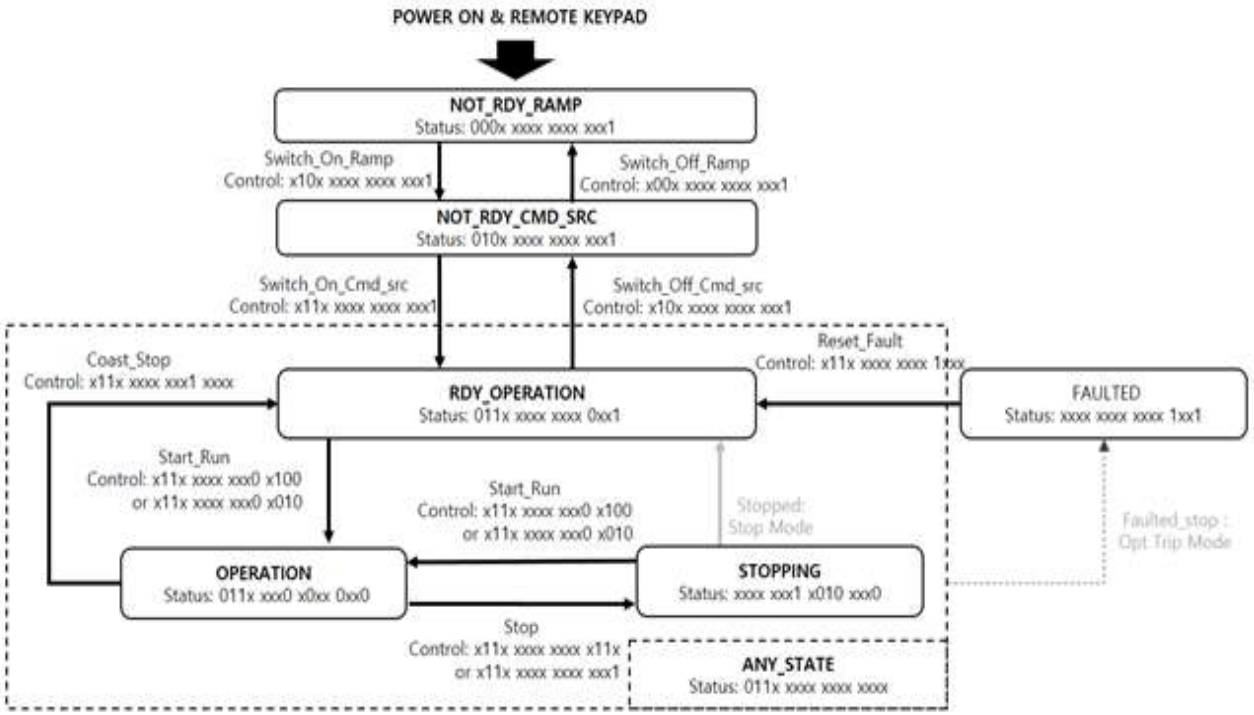


Figure 6. LS Drive Profile state machine

12.3.1 Control word

Bit	Name	Value	Description
0	Stop	0	No control commands
		1	Stop command
1	Move forward	0	No control commands
		1	Move forward command
2	Reverse command	0	No control commands
		1	Reverse operation command
3	Defect released	0	No control commands
		1	Initialize fault status
4	Emergency stop	0	No control commands
		1	Forced Emergency Stop (Coast Stop)
5 ~12	-	-	-
13	Operation command authority	0	Cancel remote operation command authority
		1	Grant remote operation command authority

Bit	Name	Value	Description
14	RAMP source command authority	0	Cancel remote RAMP source command authority
		1	Grant remote RAMP source command authority
15	-	-	-

12.3.2 Status word

Bit	Name	Value	Description
0	Stop	0	Not stopped
		1	Stopped by the stop mode
1	Moving forward	0	Not moving forward
		1	Moving forward
2	Moving in reverse	0	Not moving in reverse
		1	Moving in reverse
3	Defect occurred	0	No defects
		1	Defect occurred
4	Accelerating	0	Not accelerating
		1	Accelerating according to target command
5	Decelerating	0	Not decelerating
		1	Decelerating according to target command
6	Speed reached	0	Target speed not reached
		1	Target speed reached
7	DC braking	0	No DC braking
		1	DC braking
8	Stopping	0	Not stop mode
		1	Enter stop mode
9	Jog mode	0	Jog mode OFF
		1	Jog mode ON
10	Brake open signal	0	No open signal
		1	Open signal occurred

Bit	Name	Value	Description
11	Move forward command	0	No control commands
		1	Received move forward command
12	Move in reverse command	0	No control commands
		1	Received move reverse command
13	Preparing operation command	0	Remote driving command authority canceled
		1	Remote driving command authority granted
14	Preparing RAMP source command	0	Remote RAMP source command authority canceled
		1	Remote RAMP source command authority granted
15	Keypad control status	0	Controlling remotely
		1	Controlling Keypad Local

12.3.3 Setpoint value

Indicates the operating command frequency. The unit is Hz and the scale is 0.01.

12.3.4 Actual speed value

Indicates the actual operating frequency of the inverter. The decimal value is Hz and the scale is 0.01.

13 Communication Protocol

13.1 Cyclical message types

For the Profibus DP communication module and master to proceed with data exchange, set how many words of data you want to send and receive. Telegram settings are basically set by the Master during I/O configuration and cannot be set by the communication module itself.

13.1.1 PPO Type

This is a telegram type that simultaneously supports reading and writing of the parameter data. Each type number specifies a telegram in a uniquely specified word unit (2 Bytes). The area for PZD1 and PZD2 cannot be used arbitrarily because the PROFIdrive profile is used when using the PPO-type Telegram. Process data can be arbitrarily set from PZD2 to PZD10.

PPO Type	Parameter data area								Process data																	
	PKW								PZD1		PZD2		PZD3		PZD4		PZD5		PZD6		PZD7		PZD6		PZD7		PZD8	
OUT area	Identifier		Index		Value				STW1 (fixed)		REF (fixed)		Para Control-1		Para Control-2		Para Control-3		Para Control-4		Para Control-5		Para Control-6		Para Control-7		Para Control-8	
IN area									ZSW1 (fixed)		ACT (fixed)		Para Stauts-1		Para Stauts-2		Para Stauts-3		Para Stauts-4		Para Stauts-5		Para Stauts-6		Para Stauts-7		Para Stauts-8	
Byte (HI | LO)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
PPO1																												
PPO2																												
PPO3																												
PPO4																												
PPO5																												
PPO6																												

Figure 7. Structure Comparison of PPO Types

OUT area: Data (control data) sent from the Master to Slave.

IN area: Data sent from Slave to Master (actual data).

Parameter data area

ID : Parameter identification(type and number)

IND : subIndex of parameter

Value : Request/Response Parameter value

PKW : Parameter ID/value

Process data

STW1 : Control word

ZSW1 : Status word

REF : Reference Value

ACT : Actual Value

PZD : User-specific area Process data

13.1.2 Standard Telegram1

The Standard Telegram 1 consists of control word, which are two words sent to the Drive, setpoint value, status word, which are two words returned to the PLC, and active speed.

	Byte 0-1 (PZD1)	Byte 2-3 (PZD2)
PLC to Drive	Control word(STW1)	Setpoint value (REF)
Drive to PLC	Status word(ZSW1)	Actual speed value(ACT)

13.1.3 Vender Specific Telegram

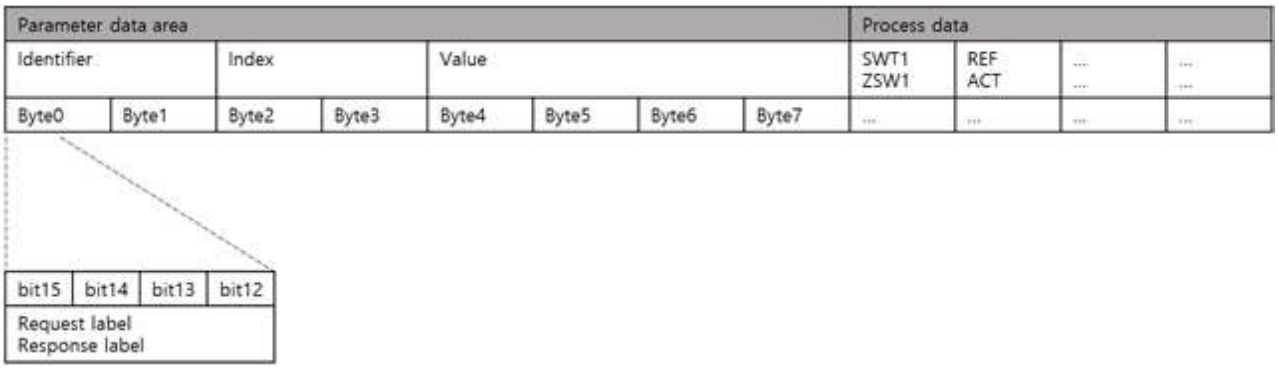
Instead of using a separate standardized telegram, depending on the Para Control Num and the Para Status Num, the number of words to use is determined. PZD 1-8 is set according to the parameter address value specified in Para Control-1-8, Para Status-1-8.

	Byte 0-1 (PZD1)	Byte 2-3 (PZD2)	Byte 4-5 (PZD3)	Byte 6-7 (PZD4)	Byte 8-9 (PZD5)	Byte10-11 (PZD6)	Byte12-13 (PZD7)	Byte14-15 (PZD8)
PLC to Drive	Para Control-1	Para Control-2	Para Control-3	Para Control-4	Para Control-5	Para Control-6	Para Control-7	Para Control-8
Drive to PLC	Para Status-1	Para Status-2	Para Status-3	Para Status-4	Para Status-5	Para Status-6	Para Status-7	Para Status-8

13.2 Parameter Access

13.2.1 Cyclic Parameter data transfer (DP-V0)

The parameter access of the method is used only when using PPO type 1, 2, and 5 telegrams. The parameter data area (PKW) portion defines a separate header for parameter access. The PKW telegram section can be used to monitor or change the parameters of the inverter. Inside the PKW, it is divided into PKE, IND, and PWE, and the structure is 8 bytes as shown below.



The request label is used by the Master when sending data to the Slave, and the response label is used when the Slave checks for positive or negative responses. See the table below for details.

Request labels (from master to slave)		Response label (Acknowledgement from slave to master)	
Request identifier	Function	Response identifier	
		Positive	Negative
0	No task	0	-
1	Request parameter value	1,2	7
2	Change parameter value (word)	1	7,8
3	Change parameter value (double) *not supported	2	7,8
4	Request description element *not supported	3	7
5	Change description element *not supported	3	7,8
6	Request parameter value (array)	4,	7,8
7	Change parameter value (array word)	4	7,8
8	Change parameter value (array double word) *not supported	5	7,8
9	Request number of array elements *not supported	6	7

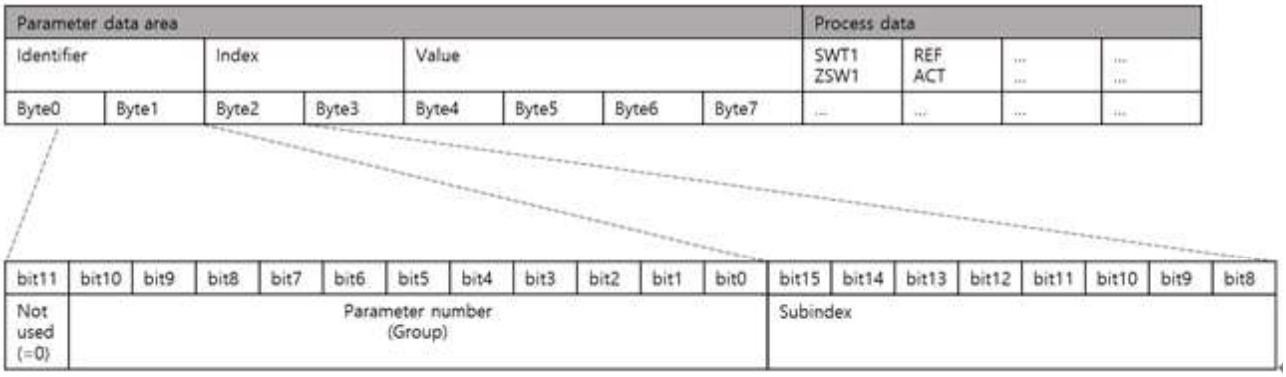
Response label (Acknowledgement from slave to master)	
Response identifier	Function
0	No response
1	Transfer parameter value (word)
2	Transfer parameter value (double word) *not supported
3	Transfer description element *not supported
4	Transfer parameter value (array word)
5	Transfer parameter value (array double word) *not supported
6	Transfer number of array elements *not supported

Response label (Acknowledgement from slave to master)	
7	Task cannot be executed, followed by error number
8	No parameter change rights for PKW interface
9	Parameter data signal (word) *not supported
10	Parameter data signal (double word) *not supported

This means that the command cannot be executed if the response identifier value is 7 and returns an error code to the value (parameter value) of the response packet. The details are as follows:

Error code	meaning
h00	Illegal parameter number
h01	Parameter value cannot be modified
h02	Low or high limit exceeded
h03	Invalid subindex
h04	No array
h05	Incorrect data type
h06	Setting not permitted (can only be reset)
h07	Description element cannot be changed
h09	No description data available
h0B	No operation priority
h0F	No text array available
h11	Request cannot be executed because of operating mode
h14	Value impermissible
h15	Response too long
h16	Parameter address impermissible
h17	Illegal format
h18	Number of values inconsistent

Here is how to assign the PROFIdrive and Drive parameters to the parameter identification part within the PPO type:



- The group column corresponds to the parameter number (PNU) of the identifier.
- The subindex column corresponds to the IND portion of the parameter index.

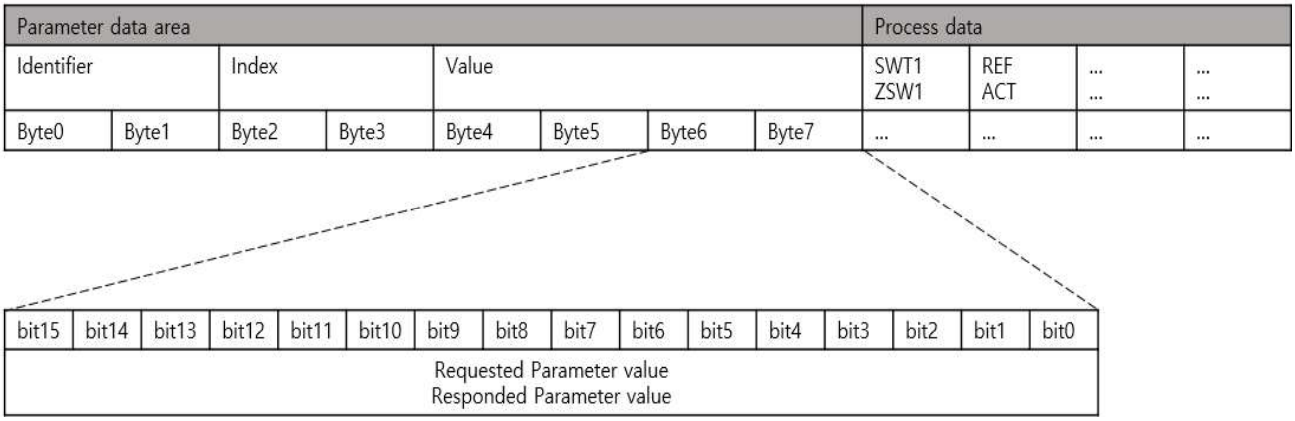
PROFIdrive Parameters			
Parameter number(decimal)		Group	Subindex
918	0	0h396	0h00
922	0	0h39A	0h00
…	…	…	…
964[0]	0	0h3C4	0h00
964[1]	1		0h01
…	…	…	…

See Chapter 7. PROFIdrive Parameters for a full list of PROFIdrive parameters.

Drive Parameters		
Parameter number(heximal)	Group	Subindex
0h000A	0h000	0h0A
0h000B	0h000	0h0B
0h0316	0h003	0h16
…	…	…
0h1101	0h011	0h01
…	…	…

For a full list of drive parameters, see Parameter sessions in the Drive User Manual.

The parameter value can be set according to the read/write properties of each specified parameter, and the value of the requested parameter number can be read or changed. Only Byte 6 and 7 data are valid because they do not support 32-bit data, just 16-bit data.



Note: To prevent continuous writing of parameters, the requested parameter value will be applied only once when the request value changes.

13.2.2 Acyclic Parameter data transfer (DP-V1)

It is a method of periodically requesting/responding parameters by accessing from Master class 2 without being dependent on a separate telegram type. The method to use the write/read service for the drive parameters is as follows:

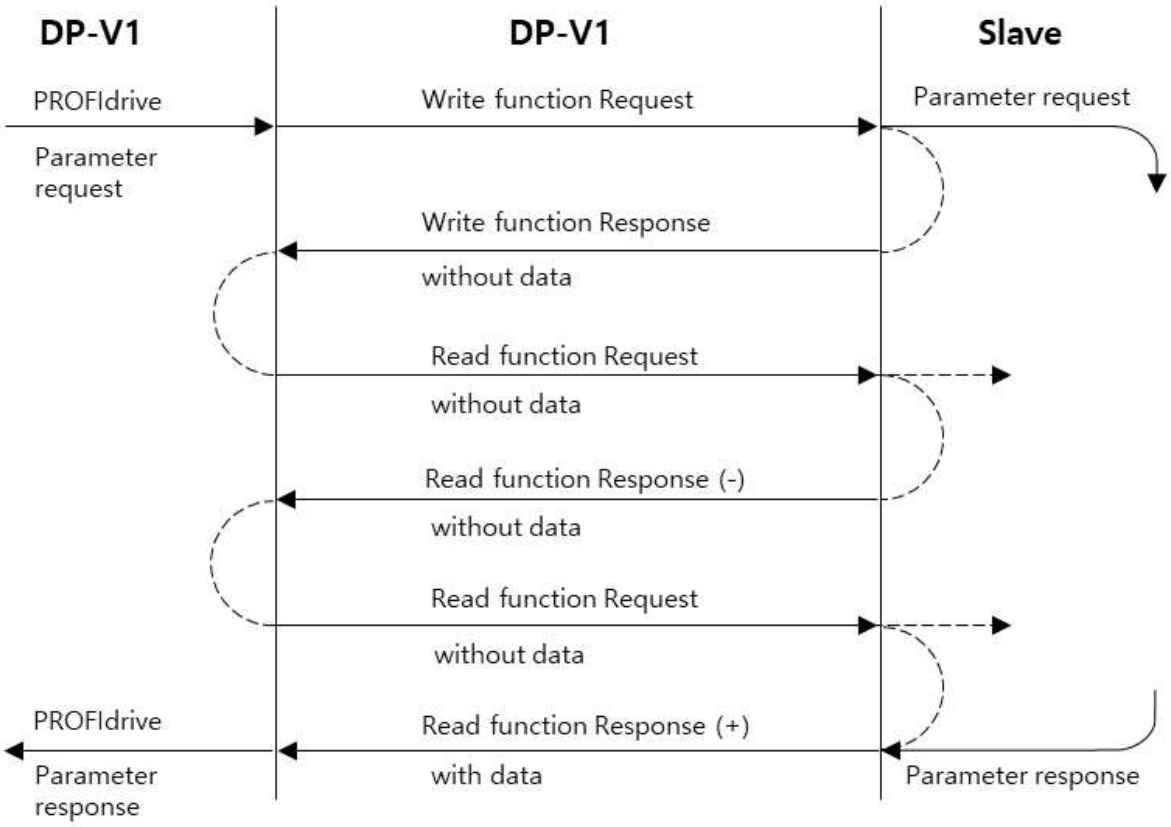


Figure 8. PROFIdrive Acyclic Parameter Access Mechanism

If the write request is a valid request, the communication module will accept it. The Master can then send a read request. If the communication module is still performing an internal parameter request, it returns a response with the error code "0xB5" (state conflict).

PROFIBUS DP-V1 frames are mapped inside standard PROFIBUS frames as follows:

<table>
<tr><th colspan="6">PROFIBUS frame</th></tr>
<tr><td>PROFIBUS header</td><td colspan="4">DU(Data Unit)</td><td>PROFIBUS Trailer</td></tr>
<tr><td rowspan="2">(SD SSAP)</td><td rowspan="2">DP-V1 header</td><td>Parameter Request header (write request or read request)</td><td>Parameter address</td><td>Parameter value</td><td rowspan="2">(FCS, ED)</td></tr>
<tr><td>Parameter Response header</td><td colspan="2">Parameter value</td></tr>
</table>

DP-V1 header

DP-V1 header consists of 4 Bytes, and each 1 Byte content is as follows:

DU	Byte	Field(s)	Description	Allowed values
DP-V1 header	0	Function Number	PROFIBUS DP Function Codes	0h48 = Idle requests, response 0h57 = Initiate requests, response 0h58 = Abort requests 0h5E = read requests, response 0h5F = write requests, response
	1	Slot Number	PROFIBUS DP Device Slot Number	0h01 = parameter access
	2	Index	PROFIBUS DP index for specific properties	47(decimal) = Parameter Access
	3	Data Length	Number of data bytes in the parameter request frame. This number's unit is Byte, excluding the DP-V1 header.	(It depends on the type of message the Master requests.)

Error responses of DP-V1 function

DU	Byte	Field	Description	Allowed values
DP-V1 header	0	Function Number	PROFIBUS DP Function Codes	0hDE = slave response error in read request. 0hDF = slave response error in write request.
	1	Error Decode	Displays the information values for the error-decoding method.	128
	2	Error Code 1	The top 4 bits represent the error class, and the bottom 4 bits represent the error code.	See the Error code 1 table below
	3	Error Code 2	Application-specific	0

Errror code 1 :

Error class	Meaning	Error code
0…9	(Reserved)	
10 (0h0A)	Application	0 = Read error 1 = Write error 2 = Module failure 3…7 = Reserved 8 = Version conflict 9 = Feature not supported 10…15 = User-specific
11 (0h0B)	Access	0 = Invalid index 1 = Write length error 2 = Invalid slot 3 = Type conflict 4 = Invalid area 5 = State conflict 6 = Access denied 7 = Invalid range 8 = Invalid parameter 9 = Invalid type 10…15 = User-specific
12 (0h0C)	Resource	0 = Read constraint conflict 1 = Write constraint conflict

Error class	Meaning	Error code
		2 = Resource busy 3 = Resource unavailable 4…7 = Reserved 8…15 = User-specific
13…15	User-specific	-

Parameter Requests

Each parameter request via PROFIBUS DP-V1 consists of three elements:

Request header	Parameter address	Parameter value (only in Change requests)

Parameter Request				
DU	**Byte**	**Field(s)**	**Description**	**Allowed values**
Request header	0	Request Reference	Unique identification ID entered by the master. Request by changing it according to each new request.	1-255
	1	Request ID	Request type of issued block.	Request Parameter (0h01) Change Parameter (0h02)
	2	Drive Object ID	Always 0x01	0-1
	3	No. of Parameters	Number of parameters n to request	1-8
Parameter address 1)	4+n-1	Attribute	Value properties for parameters to be accessed.	Value (0h10)
	5+n-1	No. of Elements	Length of array element parameter or string to be accessed. Set to zero if you are using a non-array parameters.	0-8
	6+n-1, 7+n-1	Parameter Index	Parameter address to access.	-
	8+n-1, 9+n-1	Subindex	Sub-address of parameter address	-
Parameter value 2)	10	Format	Data type	Unsigned16(0h06)
	11	Number of	Number of arrays to be changed in	0-8

Parameter Request				
		Values	the parameter with Change Parameter (0h02). Only array type parameters are applied.	
	12, 13	Values	Requested Value	-

1) If you request multiple request IDs 01h (parameter request), it is repeated with n.
2) The format, number of values, and values fields are repeated for other parameters only if the request ID is 02h (parameter change).

Parameter Responses

Each parameter response to PROFIBUS DP-V1 consists of two elements:

Response header	Parameter value (only in requests parameter)

Parameter Response				
DU	**Byte**	**Field(s)**	**Description**	**Allowed values**
Response header	0	Response Reference (mirrored)	Returns requested unique identification ID	1-255
	1	Response ID	Type of Response returned by the Slave. If the requested service fails, a "Not Approved" (NAK) response is displayed.	Request Param OK(0h01) Request Param NAK(0h81) Change Param OK(0h02) Change Param NAK(0h82)
	2	Drive Object ID	Always 0x01	0-1
	3	No. of Parameters	Number of requested response parameters n	1-8
Parameter value 3)	4+n-1	Format	Data type	Unsigned16(0h06)
	5+n-1	Number of Values	Number of array requested response values per parameter	Depending on requested Parameter numbers
	6+n-1, 7+n-1	Values	Response value of the requested address	-

3) The format, number of values, and values fields are repeated for other parameters only if the response ID is 01h (request parameter OK). Receives the requested amount n.

14 PROFIdrive Parameters

14.1 Supported Parameters

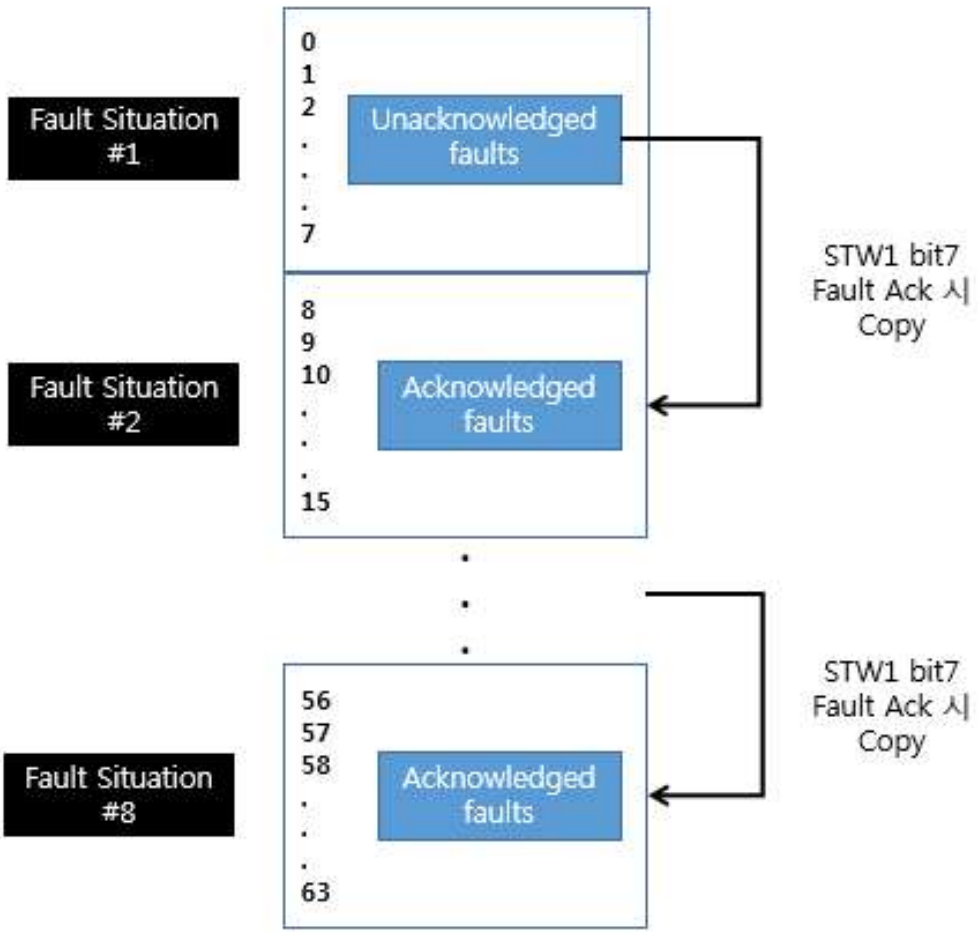
Parameters			
PNU	R/W	Data Type	Description
918	R	Unsigned16	Displays the selected node address in the FBus ID (COM-07).
922	R	Unsigned16	Displays the selected cyclic telegram in the master's I/O configuration. 1 : Standard Telegram 1 100 : Vender Specific Telegram 101 : PPO Type 1 (PKW 4/4 + PZD 2/2) 102 : PPO Type 2 (PKW 4/4 + PZD 6/6) 103 : PPO Type 3 (PZD 2/2) 104 : PPO Type 4 (PZD 6/6) 105 : PPO Type 5 (PKW 4/4 + PZD 10/10) 106 : PPO Type 6 (PZD 10/10) * Vendor Specific Telegram means using the set process data according to the Para Status Num (COM-30) and Para Ctrl Num (COM-50) of the inverter.
930	R	Unsigned16	Indicates the communication profile currently in use. 1 : PROFIdrive Profile 0x8000 : I/O Profile 0x8002 : LS Drive Profile * When using vendor-specific Telegram, 0x8000 is applied. Therefore, control word (STW1) and status word (ZSW1) cannot be used/verified.
944	R	Unsigned16	The fault message counter value, which increases by one each time a fault occurs. Depending on whether this parameter value is increases, the Profibus DP controller, such as PLC, can determine whether a new Fault has occurred in the inverter.
947	R	Array[8][8] Unsigned16	Fault number * See description of PNU[944] Fault Message Counter and PNU[947] Fault Number.
953	R	Unsigned16	Warning word * Displays the value of the "Warning Information" parameter at the inverter communication address 0h0334.
963	R	Unsigned16	Detected baud rate: 0 = 9.6 kbit/s

Parameters			
			1 = 19.2 kbit/s 2 = 93.75 kbit/s 3 = 187.5 kbit/s 4 = 500 kbit/s 6 = 1.5 Mbit/s 7 = 3 Mbit/s 8 = 6 Mbit/s 9 = 12 Mbit/s 11 = 45.45 kbit/s 255 = Invalid baud rate
964	R	Array[7] Unsigned16	A value for a five-word (16-bit) array that displays information about the communication module. 0: Displays 849 (0h0351) as the manufacturer ID of LSELECTRIC as defined in Manufacturer (Profibus.org). 1: Device Type: The Profibus DP communication module displays a value of 1. 2: Version: Indicates the software version. Ex.) Version 1.2 is displayed as 0h0102. 3: Firmware Date (yyyy): Indicates the year the software was created. Ex.) 2021 is displayed as 0h07E5. 4: Firmware Data (dd/mm): Indicates the date/month when the software was created. Ex.) December 25 is displayed as 0h0C19. 5: Number of Axes 6: Identification (0h0A6C)
965	R	Unsigned16	A parameter that displays the Profile ID. (0h0328 – Profile 3 v4.0)
967	R	Unsigned16	Displays the control word (STW1) value that is currently input through the Profibus DP.
968	R	Unsigned16	Displays the current status word (ZSW1) value passed through the Profibus DP.
972	R/W	Unsigned16	When the value is changed from 0 to 1, the Profibus DP communication module is reset to initialize the values of 944, 947, and 953 to zero.

14.2 Description of the PNU[944] Fault Message Counter and the PNU[947] Fault Number

Each time the inverter encounters a fault, the PNU[944] Fault Message Counter value increases by one, and the fault is stored in the PNU[947] Fault Number variable.

The PNU[947] Fault Number can store eight fault situations, and each fault situation can store eight fault messages. For each fault message is one 16-bit word, the PNU[947] Fault Number consists of 64 words in total. The basic configuration is shown below.



Fault situation #1 stores the currently occurring fault messages. Each Fault Message is stored sequentially from the first time in order of occurrence, and if there are more than eight, it will be overwritten to the eighth (index: 7) memory. If a bit 7 of control word (STW1) of PLC is set to 1 to cause Fault Ack, the value of fault situation #1 is moved to fault situation #2. This behavior is repeated until fault situation #7.

The stored fault message corresponds to the inverter trip information (latch type trip information-1/2, level type trip information, hardware diagnostic trip information) one-to-one and is defined as follows:

Trip Name	Fault Message
Overload Trip	1
Underload Trip	2
Inverter Overload Trip	3
E-Thermal Trip	4
Ground Fault Trip	5
Out phase open trip	6
In phase open trip	7
Overspeed	8
Overspeed Deviation	9
NTC Trip	10
Overcurrent Trip	11
Overvoltage Trip	12
External Trip	13
Arm Short	14
Overheat Trip	15
Fuse Open Trip	16
MC Fail Trip	17
Encoder Error Trip	18
Thermal sensor (PTC) trip	19
FAN Trip	20
Reserved	21
Error in Parameter Write	22
Pre PID Fail	23
Bad contact at basic I/O board	24
External brake trip	25
No Motor Trips	26
Poor contact on Slot 1 option card	27
Poor contact on Slot 2 option card	28
Poor contact on Slot 3 option card	29
Blocking inverter output by input of terminal on safety option (only products with 90 kW or higher)	30
Reserved	31
Reserved	32
BX	33

Trip Name	Fault Message
LV	34
Lost Command	35
Keypad Lost Command	36
Reserved	37
Reserved	38
Reserved	39
Reserved	40
Reserved	41
Reserved	42
Reserved	43
Reserved	44
Reserved	45
Reserved	46
Reserved	47
Reserved	48
ADC error	49
EEPROM error	50
Watchdog-1 error	51
Watchdog-2 error	52
Gate Drive Power Loss	53
Reserved	54
Reserved	55
Reserved	56
Reserved	57
Reserved	58
Reserved	59
Reserved	60
Reserved	61
Reserved	62
Reserved	63
Can not connect	64

15 I&M records

The I&M function is one of the customer support services that is used to check basic information during the start-up and maintenance of the module.

	Content	Size	Description
DP-V1 header	Function_Num	1 Byte	5Fh
	Slot_Number	1 Byte	0…255(deciaml)
	Index	1 Byte	0hFF
	Length	1 Byte	0h04
Call Header	Extended_Function_ Num	1 Byte	0h08
	reserved	1 Byte	0h00
	FI_Index	2 Byte	65000(deciaml) = I&M0

Rread/write access to I&M records

Content	Size	Description
Header	10 Byte	-
MANUFACTURER_ID	2 Byte	PROFINET Vendor ID 0h0351
ORDER_ID	20 Byte	Depending on Communication module order number
SERIAL_NUMBER	16 Byte	Serial number of Communication module
HARDWARE_REVISION	2 Byte	Hardware version of
SOFTWARE_REVISION	4 Byte	Format: V255.255.255 E.g., V1.0.0 = software version 1.00
REVISION_COUNTER	2 Byte	Revision number
PROFILE_ID	2 Byte	PROFIdrive (0x3A00)
PROFILE_SPECIFIC_ TYPE	2 Byte	No profile specific type (0x0000)
IM_VERSION	2 Byte	Version is 1.1 (0x0101)
IM_SUPPORTED	2 Byte	I&M0 is supported (0x0001)

Response structure for I&M0 (Read-only)

Product Warranty

Warranty Information

After purchasing and installing the product, fill out the following information in detail. This information can be used to get the benefits of a warranty when the product becomes faulty during the warranty period.

Product Name	LS ELECTRIC Communication Option Card	**Date of Installation**	
Model Name	SV-iS7 Profibus Communication Card	**Warranty Period**	
Customer Info	Name (or company)		
	Address		
	Contact Info.		
Retailer Info	Name (or company)		
	Address		
	Contact Info.		

Warranty Period

This product has been manufactured through strict quality control and test procedures by LS ELECTRIC. The warranty period is 12 months after installation or 18 months from the manufacturing date if the installation date is not filled out. However, the warranty period may vary depending on the terms of sales.

Warranty Service Information

If the product fails during a normal and proper use within the warranty period contact your local authorized LS distributor or LS service center for a free-of-charge warranty service.

Non-Warranty Service

A service fee will be incurred for malfunctions in the following cases:

- intentional abuse or negligence
- power supply problems or from other appliances being connected to the product
- acts of nature (fire, flood, earthquake, gas accidents etc.)
- modifications or repair by unauthorized persons
- If the LS ELECTRIC nameplate is not attached to the product.
- expired warranty period

Visit Our Website

Visit us at LS ELECTRIC homepage (https://www.ls-electric.com) for detailed service information.