

MOTOR CONTROL

REGAL

MDHP Series High Performance Variable Frequency Drive

Profibus-DP Option Manual



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Profibus Option
MDLV- HP Series

Marathon Drives

- When using MD 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.

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 MDHP Profibus Option. For safety precautions on the Inverter system, refer to the MDHP 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 MDHP only. Don't install it to any other device than MDHP.
- ▶ 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 MDHP 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 MDHP 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

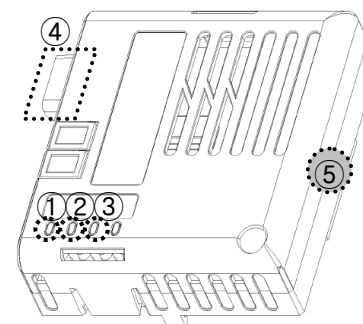


Figure 1. Exterior Appearance

● 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'.

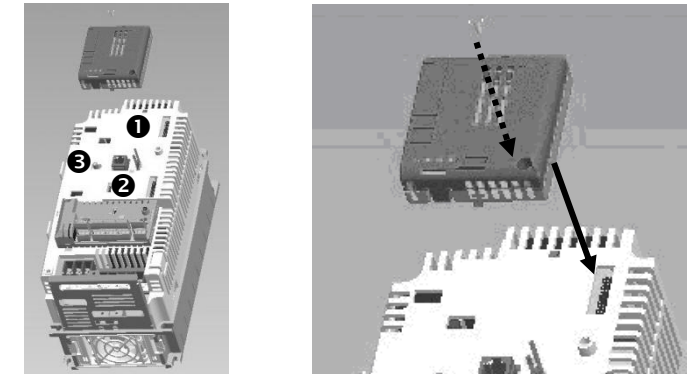
● Communication Line Connecting Terminal

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

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.
On	On-Line Status	Network, Station Address, Parameterization, Configuration are all in normal condition	
		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.

7.2 CPU LED Operation and Measures against Error

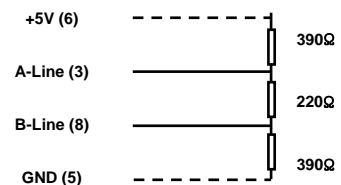
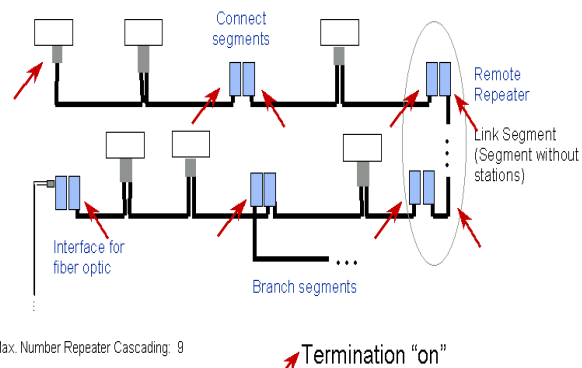
LED	Status	Cause	Help
Off	Power Supply Defect	inverter power supply defect/ Defect of Contact between inverter and option	Check for the condition of inverter power supply. Check for error of inverter. Check for the contact between inverter and connector.
Flashing with 1 sec. interval	Normal	Normal Operation	

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 arranged 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



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

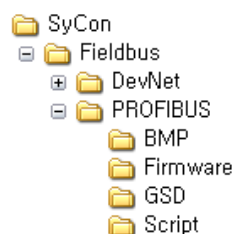
9. Environment Configuration & Other Functions

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.regalaustralia.com.au>).

- 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.



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:

- Cannot connect between Main and Option: Defect of communication between inverter and option
- Inverter H/W Diag Trip: When hardware diagnostic trip occurs in the inverter
- Inverter Latch Type Trip: When trip in latch type occurs
- Inverter Level Type Trip: When trip in level type occurs
- 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 ~ 0h11F) 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
0h118-0h11F	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

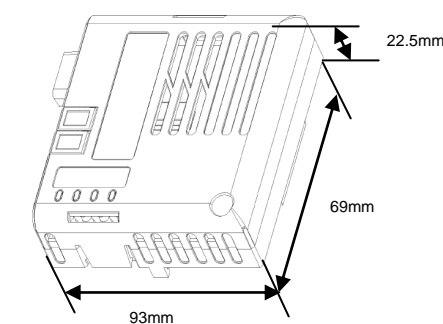
* In case of accessing the code not smaller than the size of macro currently configured, return to "Illegal data address" Error Code "02".

Note

- For further inverter address and function, please refer to 'Communication Function', Section 11 in MDHP Main Body Manual.

11. Product Size

※Option Size



12. Warranty

12.1 Warranty Service Period

Warranty period is 12 months from date of sale

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 MD distributor or MD 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 MD authorized distributor or service center.
- Damage was caused by an earthquake, fire, flooding, lightning, or other natural calamities.
- When MD nameplate is not attached.
- When the warranty period has expired.

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

HEAD OFFICE

19 Corporate Ave / PO Box 2340
Rowville VIC 3178 AUSTRALIA

Tel: +61 (0)3 9237 4000
Fax: +61 (0)3 9237 4010

AUSTRALIA

National Sales
1300 888 853
Drives Technical Support
1800 724 149
www.regalaustralia.com.au
www.regalbeloit.com

REGAL BELOIT AUSTRALIA Pty Ltd
ABN 61 122 303 084

VICTORIA

MELBOURNE
19 Corporate Avenue
Rowville VIC 3178
Tel: +61 (0)3 9237 4040
Fax: +61 (0)3 9237 4050

NEW SOUTH WALES

SYDNEY
6-7 Bushells Place
Wetherill Park NSW 2164
Tel: +61 (0)2 8781 3100
Fax: +61 (0)2 8781 3131

TASMANIA

DEVONPORT
115 Don Road
Devonport TAS 7310
Tel: +61 (0)3 6424 8574
Fax: +61 (0)3 6424 9393

NEW ZEALAND

CMG Electric Motors (NZ) Ltd
18 Jomac Place
Avondale Auckland
NEW ZEALAND
Tel: +64 9820 3550
Fax: +64 9820 8504

SINGAPORE

CMG Electric Motors
(Asia Pacific) Pte Ltd
12 Tuas Loop 637346
SINGAPORE
Tel: +65 6863 3473
Fax: +65 6863 3476

QUEENSLAND

BRISBANE
7 Mahogany Court
Willawong QLD 4110
Tel: +61 (0)7 3246 3246
Fax: +61 (0)7 3246 3210

CAIRNS ("Service - Repairs - Sales")

2/159-161 Newell Street
Bungalow QLD 4870
Tel: +61 (0)7 4033 1109
Fax: +61 (0)7 4033 5553

MACKAY

Paget Mackay QLD 4740
Tel: +61 (0)7 4952 6244
Fax: +61 (0)7 4952 6277

THAILAND

FASCO Motors (Thailand) Limited
29/7-8 Bangkruay-Sainoi Road
Bangkrang, Muang Nonthaburi
District Nonthaburi 11000 THAILAND
Tel: +66 2447 3300
Fax: +66 2447 3500

MALAYSIA

Torin Industries SND BHD
(MALAYSIA)
No. 6536A Jalan Bukit Kemuning
Batu 6 Seksyen 34
40470 Shah Alam Selangor
Tel: +60 3 51246157
Fax: +60 3 51211467

SOUTH AUSTRALIA

ADELAIDE
47 Research Road
Pooraka SA 5095
Tel: +61 (0)8 8359 1321
Fax: +61 (0)8 8359 5675

WESTERN AUSTRALIA

PERTH
21 Colin Jamieson Drive
Welshpool WA 6106
Tel: +61 (0)8 6253 3700
Fax: +61 (0)8 6253 3710