



# **TOSHIBA**

Toshiba TOSVERT VF-MB1 Function Manual



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E6581738④

**TOSHIBA**

TOSVERT VF-MB1/S15/AS3

PROFIBUS-DP Option Function Manual

PDP003Z

NOTICE

1. Read this manual before installing or operating. Keep this instruction manual on hand of the end user, and make use of this manual in maintenance and inspection.
  2. All information contained in this manual will be changed without notice. Please contact your Toshiba distributor to confirm the latest information.
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## Related Manuals for Toshiba TOSVERT VF-MB1

### [Inverter Toshiba TOSVERT VF-MB1 Instruction Manual](#)

Industrial inverter for 3-phase induction motors (350 pages)

### [Inverter Toshiba TOSVERT VF-S15 Function Manual](#)

(80 pages)

### [Inverter Toshiba TOSVERT VF-AS3 Manual](#)

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### [Inverter Toshiba TOSVERT VF-MB1 Function Manual](#)

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High-performance industrial inverter for 3-phase motors, 3-phase 240v class 0.4 to 55kw, 3-phase 480v class 0.4 to 280kw (622 pages)

### [Inverter Toshiba VF-S15 Quick Start Manual](#)

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### [Inverter Toshiba TOSVERT VF-S15 Instruction Manual](#)

Traverse control (6 pages)

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Shock monitoring function (6 pages)

### [Inverter Toshiba TOSVERT VF-S15 Instruction Manual](#)

(5 pages)

### [Adapter Toshiba VF-S15 Instruction Manual](#)

Option adapter (3 pages)

## Summary of Contents for Toshiba TOSVERT VF-MB1

[Page 1](#) 1. Read this manual before installing or operating. Keep this instruction manual on hand of the end user, and make use of this manual in maintenance and inspection. 2. All information contained in this manual will be changed without notice. Please contact your Toshiba distributor to confirm the latest information.

## [Page 2: Table Of Contents](#)

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## [Page 3: Introduction](#)

This manual describes the supported functions for the “PDP003Z”. In conjunction with this manual, the following manuals are supplied by Toshiba, and they are essential both for ensuring a safe, reliable system installation as well as for realizing the full potential of the “PDP003Z”:

[Page 4](#) E6581738④ Safety precautions On the drive and in its instruction manual, important information is contained for preventing injuries to users and damages to assets and for proper use of the device. Read the instruction manual attached to VF-MB1/S15/AS3 along with this instruction manual for completely understanding the safety precautions and adhere to the contents of these manuals.

[Page 5](#) E6581738④ ■ General Operation Warning ▼ Never disassemble, modify or repair. Doing so could result in electric shock, fire and injury. For repairs, call your sales Disassembly prohibited agency. ▼ Do not attach this option to any drive other than the VF- MB1/S15/AS3. Doing so could result in electric shock or fire.

[Page 6](#) E6581738④ ■ Wiring Warning ▼ Shut off power when installing and wiring this option. Wait at least 15 minutes and check to make sure that the charge lamp (VF- Mandatory MB1/S15/AS3) is no longer lit. ▼ Electrical construction work must be done by a qualified expert. Installation or connection of input power by someone who does not have that expert knowledge may result in fire or electric shock.

[Page 7](#) E6581738④ ■ Cautions for parameters Warning ▼ Do not use application of writing into same parameter more than 100,000 times. The Life of EEPROM is approximately 100,000 times. Frequent writing to the EEPROM Prohibited of inverter will cause a memory corruption. Notes on use Notes ▼...

## [Page 8: Product Version](#)

E6581738④ 1. Product version It shows the differences by product version below. TYPE-FORM Suffix Applicable model Ident number Manufacturer-ID VF-MB1 VF-S15 0x0C24 “-2 PDP003Z 0x0190 VF-MB1 VF-S15 VF-AS3 0x0F88 Suffix can be checked by the labels on the product and the package. Product label Package label Suffix...

## [Page 9: Overview](#)

E6581738④ 2. Overview This product is PROFIBUS communication module that can be used in a PROFIBUS network. 2.1. Specification Module specifications Item Specification Type-form PDP003Z VF-MB1 Applicable inverter VF-S15 with SBP009Z VF-AS3 Connector 9 pin D-sub Supported network PROFIBUS V0, V1 Indicator 2 LEDs indicating the Status and the Data exchange.

## [Page 10: Connection Information](#)

E6581738④ 3. Connection Information This option allows the VF-MB1/S15/AS3 drive to be communicated with the cyclic command transmission and monitoring of the original profile (“Vendor spec.”, refer to Section 7) of our company other than application profile “Profile for Variable Speed Drives PROFdrive (3.072), refer to Section 6”...

## [Page 11: Status Indicator](#)

E6581738④ 3.2. Status indicator 3.2.1. On the option The PDP003Z has two LEDs, ST (Status) and DX (Data exchange) to indicate the statuses of PROFIBUS-DP and the PDP003Z itself. ST (Status) DX (Data exchange) ST (Status): Red LED Meanings No diagnostics present 8 Hz (Blinking 4 times/1sec.): Waiting for parameterization or configuration Flashes...

## [Page 12: Hardware Setup](#)

E6581738④ 4. Hardware Setup When using this product with VF-S15, sold separately VF-S15 option adapter (SBP009Z) is required. 4.1. Mounting and removing Warning ▼ The

mounting/removing of option must be performed without supplying power (Turn off all input power, wait at least 15 minutes, confirm that the charge lamp of inverter is no longer lit).

### [Page 13: Vf-Mb1/S15/As3 Communication Parameters](#)

E6581738④ 5. VF-MB1/S15/AS3 Communication parameters In a network, VF-MB1/S15/AS3 (PDP003Z) serves as a PROFIBUS slave device. PDP003Z configuration is set by the following parameters. Default Parameter Function Adjustment range setting c150 PDP003Z 2 to 126 Station address The station address "126" cannot exchange data. c151 PDP003Z 0: 12 Mbit/s...

### [Page 14: Profidrive Profile](#)

E6581738④ 6. PROFIdrive Profile Transmission frame of each Telegram of this product is configured as shown below. PKW: Parameter ID/value PZD: Process Data, cyclically transferred  
Cyclic Cyclic Cyclic Cyclic Cyclic Cyclic PKW1 PKW2 PKW3 PKW4 data1 data2 data3 data4 data5 data6 Cyclic Cyclic...

### [Page 15: Stw Control Word Data](#)

E6581738④ 6.2. STW Control Word Data PDP003Z supports only speed control mode. Value Name Note "Switched on" condition Normal stop. No Coast Stop All "Coast Stop (OFF2)" commands are withdrawn Coast Stop (OFF 2) Coast stop. No Quick Stop All "Quick Stop (OFF3)" commands are withdrawn. Quick Stop (OFF 3) Quick Stop Enable Operation...

[Page 16](#) E6581738④ ZSW Status Word Data Value Name Note Ready To Switch-on Power supply is switched on Not Ready To Switch-on Ready To Operate Refer to control word, bit 1. Not Ready To Operate Drive follows setpoint. Operation Enabled (Refer to control word 1, bit 3) Operation Disabled Fault Present VF-MB1/S15/AS3 tripped.

[Page 17](#) E6581738④ 6.2.1. Tolerance Range (ZSW Bit 8) If the setpoint is changed: 1. ZSW Bit 8 is set 0 2. Calculate the tolerance. 3. Start the timer which will time-out based on parameter Tmax. PDP003Z checks that the timer (Tmax) has not timed-out and if the actual value is within the tolerance.

### [Page 18: State Machine](#)

E6581738④ 6.3. State Machine ZSW Bit 6 = 1 SWITCH-ON MAINS OFF INHIBIT Power ON STW Bit 0 = 0 A B C D ZSW Bit 0 = 0 NOT READY TO SWITCH-ON from any state STW Bit 3 = 0 STW: xxxx xxxx xxxx x110 FAULT OPERATION...

[Page 19](#) E6581738④ 6.3.1. Examples of driving by the State Machine When using the PROFIdrive profile, the frequency reference is set to HSW. The setting value "0x0000" - "0x4000" is equivalent to "0" - "Base frequency (parameter)". In order to the reverse operation, the frequency reference is set with two's complement of the forward frequency reference.

### [Page 20: Access To The Profibus Parameter](#)

E6581738④ 6.4. Access to the PROFIBUS parameter In the cyclic PROFIBUS-DP communication, the parameter data is transferred via Telegram 100, 101. If the requirement is not executed, the cause is distinguished by octet 7 and 8. (Parameter ID/value) Process data (cyclically) PZD1 PZD2 Octet 1 Octet 2 Octet 3 Octet 4 Octet 5 Octet 6 Octet 7 Octet 8...

### [Page 21: Profibus Parameter \(Pnu\)](#)

E6581738④ 6.5. PROFIBUS parameter (PNU) data type Note drive c001 Array [6] PNU 915, IND 0 = the parameter drive c002 Unsigned16 PNU 915, IND 1 = the parameter drive c003 PNU 915, IND 2 = the parameter drive PNU 915, IND 3 = the parameter c004 drive...

[Page 22](#) E6581738④ 1.5 Mbit/s 3 Mbit/s 6 Mbit/s 12 Mbit/s 11= 45.45 kbit/s (Only for the VF-AS3) Array [5] Drive Unit identification Unsigned16 (VF-MB1/S15) IND 0 = PDP003Z ID (0x0C24) (VF-AS3) IND 0 = PDP003Z ID (0x0F88) IND 1 = Manufacturer-ID (0x0190) IND 2 = VF-MB1/S15/AS3 CPU1 version IND 3 = VF-MB1/S15/AS3 firmware release year (yyyy) IND 4 = VF-MB1/S15/AS3 firmware release date (ddmm)

[Page 23](#) E6581738④ 6.5.1. Examples of reading the PROFIdrive parameter 6.5.1.1. Example 1. Reading the PNU 922 (Telegram) AK = 1 (Request parameter value) SPM = 0 PNU = 922 (0x039A) Requirement □□□ □□□ Response (Value: 0x0065 = 101) □□□ □□□ 6.5.1.2. Example 2.

Reading the PNU 964, IND 0 AK = 6 (Request parameter value (array)) SPM = 0 PNU = 964 (0x03C4)

## [Page 24: Access To Vf-Mb1/S15/As3 Parameter](#)

E6581738④ 6.6. Access to VF-MB1/S15/AS3 parameter When access to VF-MB1/S15/AS3 parameter, set "1" to the PNU. The communication number of the drive parameter is set to the sub-index IND. Refer to the drive instruction manual about the communication number and unit.  
\* This procedure changes the value of VF-MB1/S15/AS3 EEPROM.

[Page 25](#) E6581738④ 6.6.1.3. Example 3. Reading the status monitor parameter ( fe02 (The operation frequency)) AK = 6 (Request parameter value (array)) SPM = 0 PNU = 1 IND = 0xFE02(fe02 communication number) Requirement □□□ □□□ Response (Value: 0x03E8 (= 1000 -> 10.00Hz)) □□□...

## [Page 26: Vendor Spec. Profile](#)

E6581738④ 7. Vendor Spec. Profile c001 c006 Cyclic command transmission (the value of the parameter ) and c021 c026 monitoring (the value of the parameter ) are possible for PDP003Z by the original profile Select the "Telegram 100", "Telegram 101" or "Telegram 102" as the profile on the configuration.

## [Page 27: Telegram 100: Vendor Specific](#)

E6581738④ VF-AS3 profile Scanner input c001 - c006 Scanner output c021 - c026 0: No action 0: No action 1: fa06 (Communication command 1) 1: fd01 (Status information 1) 2: fa23 (Communication command 2) 2: fd00 (Output frequency, 0.01Hz) 3: fa07 (Frequency command, 0.01Hz) 3: fd03 (Output current, 0.01%, With filter) 4:fa33 (Torque command 0.01%) 4: fd05 (Output voltage, 0.01%, With filter)

## [Page 28: Telegram 101: Vendor Specific](#)

E6581738④ Telegram 101: Vendor specific 7.2. The parameter access via PKW, and the transmission of six commands and monitors via cyclic data are supported by Telegram 101. PLC → INV INV → PLC INV: Inverter PKW: Parameter ID/value PKW1 PKW1(PKE) PKW1(PKE) PKE: Parameter ID (1st and 2nd octet) PKW2...

## [Page 29: How To Use](#)

E6581738④ 7.4. How to use The purposes are adjustment by real time command transmission, and the monitor of an operation state by using cyclic communication of PROFIBUS. Example 1: Command transmitting When you want to set "0xC400" to parameter fa06, set "1 (fa06)" to parameter c001 c001 And since 0 and 1 byte of the PZD1 supports the parameter...

## [Page 30: The Overview Of The Vf-Mb1/S15/As3 Parameter](#)

E6581738④ 7.5. The overview of the VF-MB1/S15/AS3 parameter fa06 (Communication command1) 7.5.1. VF-MB1/S15 Function Note Preset speed operation Preset speed operation is disabled frequencies 1 or preset speed operation Preset speed operation frequencies (1-15) are set by frequencies 2 specifying bits for preset speed operation frequencies 1-4.

[Page 31](#) E6581738④ 10 Run/Stop Stop 11 Coast stop Standby Cost stop 12 Emergency off Emergency off Always enable, [E] trip 13 Fault reset Reset Trip reset Enabled regardless of the setting of 14 Frequency priority Enabled fmod Enabled regardless of the setting of 15 Command priority Enabled cmod...

[Page 32](#) E6581738④ vb, thra 11: V/f 4 V/f 2: pt= "0", f170, f171, f172, f182 V/f 3: pt = "0", f174, f175, 11 V/f switching 2 f176, f183 V/f 4: pt = "0", f178, f179,f180, f184 OC stall 1: f601 OC stall level switching OC stall 2: f185 00: Torque limit 1 / OC stall 1 Torque limit switching 1...

[Page 33](#) E6581738④ [ VF-MB1/S15 ] (Reserved) [ VF-AS3 ] Specified data output 3 (Output terminal No.: 96, 97) [ VF-MB1/S15 ] (Reserved) [ VF-AS3 ] Specified data output 4 (Output terminal No.: 98, 99) [ VF-MB1/S15 ] (Reserved) [ VF-AS3 ] Specified data output 5 (Output terminal No.: 100, 101)

[Page 34](#) E6581738④ fd01 (Inverter operating status 1 (real time)) 7.5.10. VF-MB1/S15 Function Note Failure FL No output Under in progress Trip status includes rtry and Failure Not tripped Tripped the trip retention status are also regarded as tripped statuses. Alarm No alarm



Alarm issued Under voltage (moff) Normal...

[Page 35](#) E6581738④ Coast stop (ST = ST=ON ST=OFF OFF) No emergency Emergency stop  
Emergency stop stop status status Standby: Initialization completed, not failure stop status, not  
alarm Standby ST=ON Start-up process Standby stop status (moff), , [coff], [coff], [lstp]), ST  
=ON and RUN=ON Standby: Initialization completed, not failure stop status and not alarm  
stop...

[Page 36](#) E6581738④ VIA / VIC input value monitor is capable of reading the data from  
external devices in a range of 0.00 to 100.00% (unsigned data: 0x0000 to 0x2710). VIB input  
value monitor is capable of reading the data from external devices in a range of -100.00 to  
100.00% (signed data: 0xD8F0 to 0x2710).

[Page 37](#) E6581738④ fc91 (Alarm code) 7.5.16. VF-S15/MB1 Remarks Function (Code  
displayed on the panel) c flicking Over-current alarm Normal Alarming l flicking Inverter over  
load alarm Normal Alarming l flicking Motor over load alarm Normal Alarming h flicking Over  
heat alarm Normal Alarming p flicking...

[Page 38](#) E6581738④ fd06 (Input TB Status) 7.5.17. VF-S15/MB1 TB Name Function  
(Parameter) Input terminal function selection 1 (f111) Input terminal function selection 2 (f112)  
Input terminal function selection 3 (f113) Input terminal function selection 4 (f114) Input  
terminal function selection 5 (f115) Input terminal function selection 6 (f116) VIB\*1 Input  
terminal function selection 7 (f117)

[Page 39](#) E6581738④ fd07 (Output TB Status) 7.5.18. VF-S15/MB1 TB Name Function  
(Parameter) RY-RC Output terminal function selection 1A (f130) Output TB Function select 2A  
(f131) Output TB Function select 3 (f132) 3 - 15 (Undefined) Note: The bit described "Undefined"  
is unstable. Do not use the bit for the judgment. VF-AS3 TB Name Function (Parameter)

## [Page 40: Diagnostic](#)

E6581738④ 8. Diagnostic When the communication loss occurs, PDP003Z returns the diagnosis  
telegram including the following information. Byte 1: Station Status 1 Byte 2: Station Status 2  
Byte 3: Station Status 3 Byte 4: Master station address (VF-MB1/S15) Byte 5: PDP003Z Ident  
Number high byte (0x0C) Byte 6: PDP003Z Ident Number low byte (0x24) (VF-AS3) Byte 5:  
PDP003Z Ident Number high byte (0x0F)

## [Page 41: Profidrive Acyclic Parameter Access](#)

E6581738④ 9. PROFIdrive acyclic parameter access DP-V1 acyclic communication is mainly  
used to read/write the parameter. VF-MB1/S15/AS3 parameter and the PROFIBUS parameter can  
be read/written using PDP003Z. The following setting is necessary in the configuration to  
communicate DP-V1. (The figure below is a setting for SIMATEC Step7.) Parameter access  
sequence to VF-MB1/S15/AS3 takes place as described in the following figure.

## [Page 42: Example1. Read The Profidrive Parameter](#)

E6581738④ 9.1. Example1. Read the PROFIdrive parameter 9.1.1. Write Request data table  
(Read PNU 964 (0x03C4) IND 4) Field Description Value Header DU0 Function number 0x5F  
Header DU1 Slot number (0) 0x00 Header DU2 Index (47) 0x2F Header DU3 Length 0x0E  
Request Header (Byte 1) Request Reference...

## [Page 43: Example 2. Change The Profidrive Parameter](#)

E6581738④ 9.2. Example 2. Change the PROFIdrive parameter 9.2.1. Write Request data table  
(Change, set 0 to PNU 927 (0x039F)) Field Description Value Header (DU0) Function number  
0x5F Header (DU1) Slot number (0) 0x00 Header (DU2) Index (47) 0x2F Header (DU3) Length  
0x0E Request Header (Byte 1)

## [Page 44: Example 3. Read The Vf-Mb1/S15/As3 Parameter](#)

E6581738④ 9.3. Example 3. Read the VF-MB1/S15/AS3 parameter When access to VF-  
MB1/S15/AS3 parameter, set "1000" to the PNU. fd04 9.3.1. Write Request data table (Read  
(Input voltage)) Field Description Value Header DU0 Function number 0x5F Header DU1 Slot  
number (0) 0x00 Header DU2 Index (47)

### [Page 45: Example 4. Change The Vf-Mb1/S15/As3 Parameter](#)

E6581738④ 9.4. Example 4. Change the VF-MB1/S15/AS3 parameter When access to VF-MB1/S15/AS3 parameter, set "1000" to the PNU. \* This procedure changes the value of VF-MB1/S15/AS3 EEPROM. f130 9.4.1. Write Request data table (Change, set 7 to VF-MB1/S15/AS3 parameter Field Description Value Header DU0...

### [Page 46: Profibus Local/Remote Operation](#)

F-CC terminal open to STOP Output frequency is set up by the VIA(VF-MB1/S15) / RR(VF-AS3)) signal input. 11. GSD file As for acquisition of a GSD file for VF-MB1, VF-S15 and VF-AS3, please contact your Toshiba distributor. - 44 -...

### [Page 47: Appendix](#)

E6581738④ 12. Appendix Function number 0x5E: Read Request 0x5F: Write Request 0x5E: Positive response for Read request 0x5F: Positive response for Write request 0xDE: Negative response for Read request 0xDF: Negative response for Write request Request ID 0x01: Request the value 0x02: Change the value Response ID 0x01: Positive response for Request the value...

### [Page 48](#) ©Toshiba Schneider Inverter Corporation 2016...

This manual is also suitable for:

[Tosvert vf-s15](#) [Tosvert vf-as3](#)