



Toshiba DeviceNet Option DEV002Z-1 User Manual

Tosvert vf-as1/ps1 devicenet option function manual

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E6581281

TOSHIBA
TOSVERT VF-AS1/PS1
Option Function Manual
DEV002Z-1

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Related Manuals for Toshiba DeviceNet Option DEV002Z-1

[Network Hardware Toshiba TOSLINE-S20LP Instruction Manual](#)

T2n/t3h stations local area network (lan) for factory automation (fa) system (66 pages)

[Network Hardware Toshiba VF-A7 Instruction Manual](#)

Ethernet communications interface for the toshiba 7 series and 9 series adjustable speed drives (50 pages)

[Network Hardware Toshiba PROSEC T2 Series User Manual](#)

Modbus module (24 pages)

[Network Hardware Toshiba TOSLINE-S20 Instruction Manual](#)

Tosline-s20 active star coupler (41 pages)

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(60 pages)

[Network Hardware Toshiba RTM20 Brochure & Specs](#)

Temperature control relay (6 pages)

[Network Hardware Toshiba S2T Setup Manual](#)

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(76 pages)

[Network Hardware Toshiba RemotEye II Quick Installation Manual](#)

(7 pages)

[Network Hardware Toshiba TOSDIC-CIE DS Instruction Manual](#)

Svr service control package (43 pages)

[Network Hardware Toshiba T2N Instruction Manual](#)

Cpu module ethernet port (179 pages)

[Network Hardware Toshiba RBC-FDP2-F-PE Installation And Operating Instructions](#)

Interface (2 pages)

[Network Hardware Toshiba T1 Using Manual](#)

Toshiba modem user manual (6 pages)

[Network Hardware Toshiba GA-1170 Service Manual](#)

(37 pages)

[Network Hardware Toshiba NVS8-X User Manual](#)

Nvs network video recorder (102 pages)

Summary of Contents for Toshiba DeviceNet Option DEV002Z-1

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[Page 4: Introduction](#)

This manual describes the supported functions for the “DEV002Z”. In conjunction with this manual, the following manuals are supplied by Toshiba, and are essential both for ensuring a safe, reliable system installation as well as for realizing the full potential of the “DEV002Z”...

2. Connection Information 2.1. Connection Sizes Connection Instance I/O Messaging Explicit Messaging Notes - For the Polled I/O connection, if the actual consumed data size is less than the connection instance's consumed_connection_size attribute, the consumed data will be ignored, but the connection will otherwise produce normally.

2.3. Setting a MAC ID number and a network baud rate Configure MAC ID and network baud rate by the Dip switch on the DeviceNet option. Baud rate • MAC ID configuration The MAC ID must be unique and not match any other device on the network.

	MAC ID	Baud rate
OFF	0000	19200
OFF	0001	19200
OFF	0002	19200
OFF	0003	19200
OFF	0004	19200
OFF	0005	19200
OFF	0006	19200
OFF	0007	19200
OFF	0008	19200
OFF	0009	19200
OFF	000A	19200
OFF	000B	19200
OFF	000C	19200
OFF	000D	19200
OFF	000E	19200
OFF	000F	19200
OFF	0010	19200
OFF	0011	19200
OFF	0012	19200
OFF	0013	19200
OFF	0014	19200
OFF	0015	19200
OFF	0016	19200
OFF	0017	19200
OFF	0018	19200
OFF	0019	19200
OFF	001A	19200
OFF	001B	19200
OFF	001C	19200
OFF	001D	19200
OFF	001E	19200
OFF	001F	19200
OFF	0020	19200
OFF	0021	19200
OFF	0022	19200
OFF	0023	19200
OFF	0024	19200
OFF	0025	19200
OFF	0026	19200
OFF	0027	19200
OFF	0028	19200
OFF	0029	19200
OFF	002A	19200
OFF	002B	19200
OFF	002C	19200
OFF	002D	19200
OFF	002E	19200
OFF	002F	19200
OFF	0030	19200
OFF	0031	19200
OFF	0032	19200
OFF	0033	19200
OFF	0034	19200
OFF	0035	19200
OFF	0036	19200
OFF	0037	19200
OFF	0038	19200
OFF	0039	19200
OFF	003A	19200
OFF	003B	19200
OFF	003C	19200
OFF	003D	19200
OFF	003E	19200
OFF	003F	19200
OFF	0040	19200
OFF	0041	19200
OFF	0042	19200
OFF	0043	19200
OFF	0044	19200
OFF	0045	19200
OFF	0046	19200
OFF	0047	19200
OFF	0048	19200
OFF	0049	19200
OFF	004A	19200
OFF	004B	19200
OFF	004C	19200
OFF	004D	19200
OFF	004E	19200
OFF	004F	19200
OFF	0050	19200
OFF	0051	19200
OFF	0052	19200
OFF	0053	19200
OFF	0054	19200
OFF	0055	19200
OFF	0056	19200
OFF	0057	19200
OFF	0058	19200
OFF	0059	19200
OFF	005A	19200
OFF	005B	19200
OFF	005C	19200
OFF	005D	19200
OFF	005E	19200
OFF	005F	19200
OFF	0060	19200
OFF	0061	19200
OFF	0062	19200
OFF	0063	19200
OFF	0064	19200
OFF	0065	19200
OFF	0066	19200
OFF	0067	19200
OFF	0068	19200
OFF	0069	19200
OFF	006A	19200
OFF	006B	19200
OFF	006C	19200
OFF	006D	19200
OFF	006E	19200
OFF	006F	19200
OFF	0070	19200
OFF	0071	19200
OFF	0072	19200
OFF	0073	19200
OFF	0074	19200
OFF	0075	19200
OFF	0076	19200
OFF	0077	19200
OFF	0078	19200
OFF	0079	19200
OFF	007A	19200
OFF	007B	19200
OFF	007C	19200
OFF	007D	19200
OFF	007E	19200
OFF	007F	19200
OFF	0080	19200
OFF	0081	19200
OFF	0082	19200
OFF	0083	19200
OFF	0084	19200
OFF	0085	19200
OFF	0086	19200
OFF	0087	19200
OFF	0088	19200
OFF	0089	19200

2.4. DeviceNet LED indicator The DEV002Z MNS (module/network status), which works basically in accordance with DeviceNet specifications. Status Not Powered/Not On-line Lights Device Operational AND green. On-line, Connected Device Operational AND On-line, Not Connected Flashes green. Device On-line AND Device needs commissioning Flashes Minor Fault and/or red.

2.5. Communications-related parameters In a network, VF-AS1/PS1 (DEV002Z) serves as a DeviceNet slave device. The DEV002Z configuration is set by the following parameters. The supported parameters for each drive and their allowable adjustment ranges are defined in the appropriate Electronic Data Sheet (EDS) files. EDS files can be downloaded via the internet from http://www.inverter.co.jp/product/inv/vfas1/dev/index_i.htm Parameter...

3. Object Specifications This section contains the object specifications for all DeviceNet objects currently supported by the “DEV002Z”. Table 1 outlines those objects covered: Class Code 0x01 0x02 0x03 0x04 0x05 0x28 0x29 0x2A 0x64 For definitions of all data types referred to in these object specifications, refer to the ODVA DeviceNet Specifications.

3.1. Identity Object Class code 0x01. This object provides identification of and general information about the device. 3.1.1. Identity Object Class Attributes Attribute Name Revision Max instance 3.1.2. Identity Object Instance Attributes Attribute Name Vendor ID Device type Product code Revision (Major) Revision...

3.2. Message Router Class code 0x02. The Message Router Object provides a messaging connection point through which a Client may address a service to any object class or instance residing in the DeviceNet interface unit. 3.2.1. Message Router Class Attributes Attribute Name Revision...

[Page 12: Devicenet Object](#)

3.3. DeviceNet Object Class Code 0x03. The DeviceNet Object provides for the configuration and status of a DeviceNet port. 3.3.1. DeviceNet Object Class Attributes Attribute Name Revision Max instance 3.3.2. DeviceNet Object Instance Attributes Attribute Name MAC ID Baud Rate Bus-off Interrupt Bus-off counter Allocation information...

[Page 13: A 3.4.1. Assembly Object Class Attributes](#)

3.4. Assembly Object Class code 0x04. The Assembly Object binds attributes of multiple objects, which allows data to or from each object to be sent or received over a single connection. 3.4.1. Assembly Object Class Attributes Attribute Name Revision Max instance 3.4.2.

[Page 14: Assembly Instance Details \(F830\)](#)

3.4.5. Assembly Instance Details (f830) 3.4.5.1. Instance 20/70 - DeviceNet Standard (4 bytes, parameter f830 = 0) Byte Bit 7 Bit 6 Byte Bit 7 Bit 6 Examples of Instance 20/70 ① Stop Instance Byte 1, 0 Output Instance 20 3, 2 1, 0 Input Instance 70...

[Page 15: Instance 21/71 - Devicenet Standard \(4 Bytes, Parameter F830 = 1\)](#)

3.4.5.2. Instance 21/71 - DeviceNet Standard (4 bytes, parameter f830 = 1) Byte Bit 7 Bit 6 Net Ref Byte Bit 7 Bit 6 Ref from reference ** Net ** Bit 5 and 6 of the instance 21 byte 0 are defined as follows. Bit 5 (Net Ctrl)...

[Page 16](#) Examples of Instance 21/71 ① Stop Instance Byte 1, 0 Output Instance 21 3, 2 1, 0 Input Instance 71 3, 2 ② Forward running 1800min-1 Instance Byte 1, 0 Output Instance 21 3, 2 1, 0 Input Instance 71 3, 2 ③...

[Page 17: Instance 100/150 - Toshiba Specific \(4 Bytes, Parameter F830 = 2\)](#)

3.4.5.3. Instance 100/150 - Toshiba Specific (4 bytes, parameter f830 = 2) Byte Bit 7 Bit 6 ACC1/ DC braking ACC2 Command Frequency link link Byte Bit 7 Bit 6 DC braking ACC2 READY without ST/RUN * Bit 14 and 15 of the instance 100 byte 0 are defined as follows.

[Page 18](#) Examples of Instance 100/150 ① Stop Instance Byte 1, 0 Output Instance 100 3, 2 1, 0 Input Instance 150 3, 2 ② Forward running 60Hz Instance Byte 1, 0 Output Instance 100 3, 2 1, 0 Input Instance 150 3, 2 ③...

[Page 19: Instance 101/151 - Toshiba Specific \(8 Bytes, Parameter F830 = 3\)](#)

3.4.5.4. Instance 101/151 - Toshiba Specific (8 bytes, parameter f830 = 3) Byte Bit 7 Bit 6 Net Ref Write Byte Bit 7 Bit 6 Ref from reference Write Error Drive Status is same as the Control Supervisor class State attribute (refer to 3.7.2).

[Page 20](#) Examples of Instance 101/151 Access the inverter parameter is enabled using byte 4 to 6 of this Instance. Set the communication number of the parameter to byte 4, 5 (Index), and the value to byte 6, 7 (Data). In case of the monitor parameter "FE**", set to 0).

[Page 21: Instance 102/152 - Toshiba Specific \(12 Bytes, Parameter F830 = 4\)](#)

3.4.5.5. Instance 102/152 - Toshiba Specific (12 bytes, parameter f830 = 4) Byte Bit 7 Bit 6 Byte Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 f831 Command data (Low byte) f831 Command data (High byte) f832 Command data (Low byte)

[Page 22: How To Use Instance 102/152](#)

3.4.5.6. How to use Instance 102/152 The purposes of instances 102/152 are adjustment by real time command transmission, and the monitor of an operation state by using cyclic communication of DeviceNet. Example 1: Command transmitting by output Instance 102 When you want to set "0xC400" to parameter fa06, set "1 (FA06)" to parameter f831. And Since 0 and 1 byte of the output instance 102 supports the parameter f831, if "0xC400"...

[Page 23: The Outline Of The Parameter F831 - F836, F841 - F846 Setup Value](#)

3.4.6. The outline of the parameter f831 - f836, f841 - f846 setup value The outline is indicated about the setting item of parameter f831 - f836 and f841 - f846 in Instance 102/152 of use. Please refer to a communication functional description (VF-AS1: E6581315/VF-PS1: E6581413) for details. 3.4.6.1.

[Page 24: Fa07 \(Frequency Reference From Internal Option Pcb\)](#)

3.4.6.3. FA07 (frequency reference from internal option PCB) Frequency reference is set up by 0.01Hz unit and the hexadecimal number. For example, when "Frequency reference" is set up to 80Hz, since the minimum unit is 0.01Hz, $80 / 0.01 = 8000 = 0x1F40$ (Hex.) 3.4.6.4.

[Page 25: Fd01 \(Inverter Status \(Real Time\)\)](#)

3.4.6.8. FD01 (Inverter status (real time)) Function ALARM (Reserved) tHr2(VF2+tH2) ACC1/ACC2 DC braking Fw/Reverse Run/stop Free run (ST) Emergency stop READY with ST/RUN READY without ST/RUN 15** Local/Remote Ready for operation: Initialization completed, not a stop due to a failure, no alarm issued, not moff, not a forced stop due to II, not a forced stop due to a momentary power failure.

[Page 26: Fe36 \(Analog Input Value Vi/Ii\)](#)

3.4.6.11. FE36 (Analog input value VI/II) The value inputted into the VI/II terminal is read. The value range is 0x0 to 0x2710 (0 to 100.00 %). - Also about FE35 (RR Input), it is the same as this parameter. 3.4.6.12. FE37 (RX Input) The value inputted into the RX terminal is read.

[Page 27: Fc91 \(Alarm Code\)](#)

3.4.6.16. FC91 (Alarm code) Function Over current alarm Inverter over load alarm Motor over load alarm Over heat alarm Over voltage alarm Under voltage of main power (Reserved) Under current alarm Over torque alarm OLr alarm Cumulative run-time alarm (Reserved) (Reserved) (Reserved) Stop after instantaneous power off...

[Page 28: Connection Object](#)

3.5. Connection Object Class code 0x05. The Connection Class allocates and manages the internal resources associated with both I/O and Explicit Messaging Connections. 3.5.1. Connection Object Attributes Attribute Name Revision Max instance 3.5.2. Connection Object Instance Attributes Connection Instance ID # References the Explicit Messaging Connection (refer to 3.5.2.1).

[Page 29: Explicit Messaging Connection Object Instance Attributes \(Instance 1\)](#)

3.5.2.1. Explicit Messaging Connection Object Instance Attributes (Instance 1) Attribute Name state instance_type transportClass_trigger produced_connection_id consumed_connection_id initial_comm_characteristics produced_connection_size consumed_connection_size expected_packet_rate watchdog_timeout_action produced_connection_path_length produced_connection_path consumed_connection_path_length consumed_connection_path * connection id dependant on device Mac ID 3.5.3. Connection Class Common Services Service Service Name Code...

[Page 30: Poll Connection Object Instance Attributes \(Instance 2\)](#)

3.5.3.1. Poll Connection Object Instance Attributes (Instance 2) Attribute Name state instance_type transportClass_trigger produced_connection_id consumed_connection_id initial_comm_characteristics produced_connection_size consumed_connection_size expected_packet_rate watchdog_timeout_action produced_connection_path_length produced_connection_path consumed_connection_path_length consumed_connection_path production_inhibit_time * connection id dependant on device Mac ID 3.5.4. Connection Class Common Services Service Service Name Code...

[Page 31: Motor Data Object](#)

3.6. Motor Data Object Class code 0x28. This object serves as a database for motor parameters. 3.6.1. Motor Data Object Class Attributes Attribute Name Revision Max instance Max ID of class attributes Max ID of instance attributes 3.6.2. Motor Data Object Instance Attributes Attribute

Name Number of Attributes...

[Page 32: Control Supervisor Object](#)

3.7. Control Supervisor Object Class code 0x29. This object models all the management functions for devices within the DeviceNet "Hierarchy of Motor Control Devices". The behavior of motor control devices is described by the State Transition Diagram. 3.7.1. Control Supervisor Object Class Attributes Attribute Name Revision...

[Page 33: Control Supervisor Object Instance Attributes](#)

3.7.2. Control Supervisor Object Instance Attributes Attribute Name Number of Attributes Attribute List Run 1 Run 2 Net Control State Running 1 Running 2 Ready Faulted Warning Fault Reset Control From Net Data Access Description Type Rules USINT Number of Attributes supported USINT List of attributes supported (ARRAY)

[Page 34: Control Supervisor Object Common Services](#)

3.7.3. Control Supervisor Object Common Services Service Service Name Code 0x05 Reset 0x0E Get_Attribute_Single 0x10 Set_Attribute_Single 3.7.4. Control Supervisor Object Specific Services Control Supervisor Object 3.7.5. Run/Stop Event Matrix Run1 Run2 0 -> 1 0 -> 1 0 -> 1 0 ->...

[Page 35: Ac/Dc Drive Object](#)

3.8. AC/DC Drive Object Class code 0x2A. This object models the functions specific to an AC or DC Drive. e.g. speed ramp, torque control etc. 3.8.1. AC/DC Drive Object Class Attributes Attribute Name Revision Max instance Max ID of class attributes Max ID of instance attributes Data...

[Page 36: Ac/Dc Drive Object Instance Attributes](#)

3.8.2. AC/DC Drive Object Instance Attributes Attribute Name Number of Attributes Attribute List At Reference Net Reference Drive Mode Speed Actual Speed Reference Current Actual Current Limit Torque Actual Power Actual Accel Time Decel Time Low Speed Limit High Speed Limit Power Scale Ref From Net Drive on Hours...

[Page 37: Vender Specific Device Profiles](#)

3.9. Vender Specific Device Profiles Class code 0x64. This object provides VF-AS1/PS1's Parameter access. All parameter's Attribute ID is 3. Refer to the following about each parameter's Instance ID. Attribute ID of all parameters are 3. Moreover, about the instance ID of each parameter, it becomes "parameter communication number + 0x4000".