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Toshiba nv-pack Series Instruction Manual

Extended card

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Summary of Contents for Toshiba nv-pack Series

[Page 1](#) 6F8C1621 Unified Controller nv-pack series TC-net 100 (JTNI) Extended card Instruction Manual...

[Page 2](#) (1) The technical information provided herein describes typical operations and applications of the product and does not guarantee the intellectual property rights or other rights of Toshiba or third parties nor allows license of its use. (2) No part or the whole of this

document may be reproduced without prior consent.

[Page 3](#) Indicates Warning. Specific details are indicated near the symbol with pictures and text. Warning (Note) Descriptions of Prohibition, Mandatory Action, and Warning vary depending on the display on the main unit. Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 4](#) Otherwise, it may cause an electric Ground Mandatory shock or fire. the nv-pack series. Otherwise, it may cause an injury accident or damage to the machine if failure or malfunction occurs in the nv-pack series.

[Page 5](#) Wipe off stain on the device, module, or board. module, or board with a soft cloth. Mandatory For severe stain, use a wet cloth wrung tightly. Leaving them stained may cause wrong decision or malfunction. Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 6](#) Do not touch the terminals of the module and unit during Upon faulty operation or failure, No touch energization. contact Toshiba's branch office or service offices. It may cause an electric shock. Before using, check that the power capacity, frequency, voltage, and...

[Page 7](#) For transportation and storage of the product, use a conductive bag When destroying the product, observe Mandatory Prohibited and packaging box. the ordinances and rules of the local government. Otherwise it will cause failure. Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 8](#) (e.g. employing fool-proof design, fail-safe design, or redundant design). Disclaimer Toshiba shall not be responsible for any damage caused by fire or earthquake, acts of a third party, other accidents, the user's willful acts or negligence, misuse, or use in abnormal conditions.

[Page 9](#) (6F8C1379) Describes the main unit connection, maintenance of the typeFR controller. • Unified Controller nv-pack series typeFR PLC CPU Function Manual (6F8C1616) Describes the functions and basic use of the typeFR PLC CPU. • Unified Controller nv series/Integrated Controller V series Command Manual...

[Page 10](#) ●Notational conventions The following are the notational conventions for better understanding of this document. Describes what the user should be particularly aware of to handle the product correctly. Important: Describes what the user should observe to handle the product correctly. Note: Describes a remark.

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[Page 14](#) Chapter 1 Introducing the JTNI This chapter describes the functions, characteristics,
and names and functions of the JTNI Functions and Characteristics of the JTNI 2 Names
and Functions of the Parts 4 1.2.1 Names of the parts 4
1.2.2 Functions of the parts

[Page 15: Functions And Characteristics Of The Jtni](#)

Functions and Characteristics of the JTNI The JTNI is a device to connect the controller typeFR of the Unified Controller nv-pack series to the information and monitoring control network TC-net 100. For the interface of the JTNI, optical fiber cables are provided: One for single bus and one for dual-redundant bus.

[Page 16](#) Example of system configuration Host system network Monitoring control network TC-net 100 Unified controller Unified controller nv-pack series nv series typeFR TC-net I/O □□□□ Figure 1-1 System configuration example (Optical transmission path) Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 17: Names And Functions Of The Parts](#)

Chapter 1 Introducing the JTNI Names and Functions of the Parts 1.2.1 Names of the parts - Panel of JTNI61 State display LED -ACT -LINK -Panel of JTNI62 Station address Operation mode setting switch setting switch MODE STN-L STN-H Ethernet connector , EN (Reserved) TC-net 100 modular connector for A system, TN-A TC-net 100 modular connector for B system, TN-B JTNI61 for single have TN-A connector only, not have TN-B connector.

[Page 18: Jtni 1.2.2 Functions Of The Parts](#)

Displays the TC-net 100 B system frame transmission state Blinking (JTNI62 only). Blinking: TC-net 100 frame transmission is in execution. (green) OFF: TC-net 100 transmission is under suspension. None None LINK(green) (Reserved) TN-B None None ACT(green) (Reserved) Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 19](#) Chapter 1 Introducing the JTNI Station address setting switch (STN-H, STN-L) Switches to set the station address in hexadecimal. For setting method, refer to "Chapter 3 Setting." Operation mode setting switch (MODE) Switches to set the operation mode. For setting method, refer to "Chapter 3 Setting."...

[Page 20](#) Chapter 2 Installation and Wiring This chapter describes installation and wiring methods of the JTNI. Before installation and wiring, read this operation manual thoroughly. Installation (Installation to the extended slot) 8 Connecting the TC-net 100 Cable 9...

[Page 21: Installation \(Installation To The Extended Slot\)](#)

Chapter 2 Installation and Wiring Installation (Installation to the extended slot) Before installing or removing the module, make WARNING sure that the typeFR unit is turned off. Mandatory Otherwise, it may cause an electric shock. Do not touch the interior of the product except WARNING the switches.

[Page 22: Connecting The Tc-Net 100 Cable](#)

When an error occurs such as unable to turn on the power, stop using and contact one of Toshiba's service representatives. If you have any question, consult with one of Toshiba's service representatives. Connecting the optical fiber cord Connect the optical fiber cord to the MT-RJ type optical connectors (TN-A and TN-B) as shown below.

[Page 23: Installation And Wiring](#)

Chapter 2 Installation and Wiring Table 4-1 Allowable bent radius of the cable Allowable bent radius (mm) Cable outer Cable name diameter (mm) When When laid fixed Optical fiber code Note • The allowable bent radius of the optical fiber cable depends on the product. Follow the manufacturer's specification of your optical fiber cable.

[Page 24](#) Chapter 3 Setting Switch Setting 12 3.1.1 Station address setting switch (STN-H, STN-L) 12 3.1.2 Operation mode setting switch (MODE) 13 Network Parameter Setting 14 3.2.1 Network ID and subnet mask 14 3.2.2 Station address 15 3.2.3 Overview of multicast address

[Page 25: Switch Setting](#)

Chapter 3 Setting Switch Setting The switches that determine the operation mode and station address are on the front panel of the JTNI. The method to set the switches is shown below. Important • Set the switches that determine the operation mode and station address of the JTNI

before turning the power on.

[Page 26: Operation Mode Setting Switch \(Mode\)](#)

Initial setting Switch Name Function Setting (factory number setting) Reserved Not used
Reserved Not used Syn-node Set to syn-node setting as enable. Set off/on Off: disable On:
enable Reserved Not used Unified Controller nv-pack series TC-net 100(JTNI)Extended card
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[Page 27: Network Parameter Setting](#)

Chapter 3 Setting Network Parameter Setting The network parameters can be set with the
operation mode setting switches and station address setting switches. For the JTNI, the
following network parameters must be set. • IP address type • Station address Three IP address
types are provided;...

[Page 28: Station Address](#)

Any of the 15 addresses can be selected and registered by using one JTNI. Registration to the
JTNI is performed with the engineering tool. For the registration method, refer to "3.3 Setting
with the engineering tool." Unified Controller nv-pack series TC-net 100(JTNI)Extended card
Instruction Manual...

[Page 29](#) Chapter 3 Setting Controller 1 Controller 2 Controller 3 Controller 6 Controller 5
Controller 4 Group B Group A Figure 3-1 An example of multicast group configuration In
multicast, controllers can be grouped as shown in the example of Figure 3-1. Controllers 1, 2, 4,
and 5 belong to Group A, and Controllers 3, 5, and 6 belong to Group B.

[Page 30: Setting With The Engineering Tool](#)

For the operation method of the engineering tool, refer to "Unified Controller nv
series/Integrated Controller V series nV-Tool (Basic) operation manual "(6F8C1290). Connect the
engineering tool and controller typeFR via Ethernet. Unified Controller nv-pack series TC-net
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[Page 31: Network Parameter Setting](#)

Chapter 3 Setting 3.3.1 Network parameter setting Set the network parameters of the JTNI in
the following steps. Select the JTNI from the product tree. Select [Station] under the created
system, and select [New (W)] from [File (F)] on the menu bar. Figure 3-3 Station registration
screen Set the station name.

[Page 32](#) Select [Units] under the created station, and select [New (W)] from [File (F)] on the
menu bar. Next, select "typeFR" from the unit catcode at the [Add Unit] dialog. Figure 3-5 Unit
registration screen Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction
Manual...

[Page 33](#) Chapter 3 Setting Add the extended card to the unit. Select [Extended card] under
the units, and select [New (W)] from [File (F)] on the menu bar. Next, select "TNI61" as single,
or "TNI62" as dual, from the [Add Extended Card] dialog. Figure 3-6 Extended card registration
screen 6F8C1621...

[Page 34](#) Select [TNI62] for extended card, when [Module parameters] is selected from [File
(F)] on the menu bar, the module parameter screen is displayed. Figure 3-7 An example of
extended card registration Unified Controller nv-pack series TC-net 100(JTNI)Extended card
Instruction Manual...

[Page 35](#) Chapter 3 Setting Setting the module parameter. Open the module parameter
screen for the JTNI previously registered, then setting tab of [Parameter]. Figure 3-8 Module
parameter registration screen Register the IP address type, IP address, and subnet mask. Note •
Be careful so that the address does not overlap with other nodes. Individual settings are as
follows.

[Page 36](#) For example, if the distance is 7.3km, set "8km." • Max repeater connections: Set a
value for the path with the most repeater stages. The default value is 3. Unified Controller nv-
pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 37](#) Chapter 3 Setting • Option switch: For the option switches, refer to "3.5 Option functions." For scan cycle time of high, middle, low, Max length between nodes, and Max repeater connections, set the same values for the entire system. Download the registered information to the JTNI. To download, display the parameter information, and click [Download (D)].

[Page 38](#) Case of single, select [TC-net 100LAN]. Case of dual, select [TC-net 100LANd]. Next, select the [Modules] under the selected [TC-net 100LAN], and then select [New (W)] from [File (F)] on the menu bar. Figure 3-11 Network addition dialog Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 39](#) Chapter 3 Setting Figure 3-12 Network module registration screen Connect to [TC-net 100LAN]. The JTNI added previously is displayed on the [Add Module] dialog. Selecting, then connects it to TC-net 100LAN. Figure 3-13 Network module addition dialog 6F8C1621...

[Page 40](#) 3.3 Setting with the Engineering Tool Figure 3-14 TC-net 100LAN connection screen Connect the engineering tool via the Ethernet port, to obtain the information of the current JTNI. Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 41](#) Chapter 3 Setting After the registration is complete, check that the information of the JTNI can be read. Figure 3-16 An example of reading JTNI information 6F8C1621...

[Page 42: Setting The Scan Talker Blocks](#)

Register each of the blocks. Figure 3-18 scan talker blocks setting screen Block No.: Indicates the scan sending block number. Word No.: Specify the starting word number used in the block. Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 43](#) Chapter 3 Setting Word length: Specify the number of words used in the block. Transmission speed: Specify the transmission speed of the block in High, Medium, or Low. The maximum number of items with each of the transmission speeds are High: 64, Medium: 128, and Low: 384.

[Page 44](#) To download, display the parameter information, and select [Download (D)] or [Download All(L)]. Restart it. The downloaded information becomes effective at the next startup. After the download is complete, restart it. Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 45](#) Chapter 3 Setting Check the registered data. After the download, display the talker block parameter screen again, and select [View] -> [Module] to confirm that the information of JTNI can be read. Figure 3-21 An example of reading JTNI talker blocks information 6F8C1621...

[Page 46: Network Information](#)

Display talker state and healthy state Click "Start" Displayed are the talker state and the healthy state of the current scan blocks Figure 3-25 Display screen of the scan talker state and healthy state Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 47: Accessing The Scan Data](#)

Chapter 3 Setting 3.4.2 Accessing the scan data To access the scan data, double-click the desired block in the scan healthy map screen. Figure 3-26 Display screen of scan data Select Block No. to access the data of the desired block. Select Display Format to display the data in decimal or hexadecimal.

[Page 48: Lan Management Information](#)

Information (L)] from [Tool (T)] on the menu bar. Figure 3-27 LAN management information selection screen Displayed is the information on each node connected to TC-net 100LAN . Figure 3-28 LAN management information screen Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 49: Detailed Explanation Of Lan Management Information](#)


Chapter 3 Setting 3.4.6 Detailed explanation of LAN management information When [Detailed (D)] in the LAN management information screen is clicked, each detailed counter is displayed.

Figure 3-29 Detailed explanation of LAN management information 6F8C1621...

[Page 50: Receiving Line Switching](#)

Select receiving line of TC-net 100(Normally receive automatically). When [Switch RX(W)] in the LAN management information screen is clicked, the configuration dialog is displayed. Figure 3-31 TC-net 100 switch receiving line screen Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 51: Viewing The In-Ring Map](#)

Chapter 3 Setting 3.4.8 Viewing the in-ring map The in-ring map displays the nodes that currently belong to the TC-net 100. To display the in-ring map, click  in the LAN management information screen. The map is updated to the latest information when [Refresh (R)] is clicked. Figure3-32 Display screen of In-ring map 6F8C1621...

[Page 52: Option Functions \(Reserved\)](#)

Continuously unhealthy Talker area of Other node is normal ☐ Always unhealthy other node Healthy Other node is abnormal ☐ Unhealthy Figure 3-33 shows an example of the self healthy mode configuration. Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 53](#) Chapter 3 Setting (1) one-unit (2) two-unit configuration configuration typeFR typeFR JTNI JTNI JTNI Cable Figure 3-33 An example of the self healthy mode configuration Remark • If an error occurs in the host controller after an error occurs in the transmission path, the scan block set for the host controller becomes unhealthy.

[Page 54: Transmission](#)

The scan talker block must be set in the host controller making the scan sending start request. Important • Do not write to this block from the application. Table 3-5 shows the information configuration of the RAS information block. Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 55](#) Chapter 3 Setting Table 3-5 Information configuration of RAS information block Word Update Remark cycle Install information Module Type (0x23) target controller(*1) JTNI healthy counter 0.1s JTNI61/62 healthy counter Slot 0 healthy counter 0.1s CPU No1 PLC Slot 1 healthy counter 0.1s CPU No2 PLC Slot 2 healthy counter...

[Page 56](#) 3.6 Setting the RAS Information Block in Scan Transmission For Controller type, controller subtype, phase/mode, head alarm, refer to the operation manuals of controller typeFR(6F8C1616). Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 57](#) Chapter 3 Setting 6F8C1621...

[Page 58](#) Chapter 4 Operation This chapter describes the operations of the JTNI, such as checking before operation, startup, and shutdown.

[Page 59](#) Stop using immediately when an error occurs. CAUTION When an error occurs such as unable to turn on the Mandatory power, stop using and contact one of Toshiba's service representatives. Checking before operation Before turning on the power and operating the product, check again that the following are as described in this operation manual: •...

[Page 60](#) Chapter 5 Troubleshooting This chapter describes troubleshooting for the JTNI.

[Page 61](#) "Table 1-1 Display details on the state display LED and normal display" on page 5, or if any error is detected in the human interface station, stop using it immediately and contact one of Toshiba's service representatives.

[Page 62](#) Chapter 6 Maintenance and Inspection This chapter describes maintenance and inspection such as daily inspection, periodical inspection, and cleaning of JTNI. Inspection 50 6.1.1 Daily inspection 50 6.1.2 Periodical inspection 51 Life Limited Parts 51...

[Page 63: Inspection](#)

• The modular connector is locked. • Cable connection is not loose or has an abnormal appearance. If any abnormality is found, contact one of Toshiba's service representatives. Ventilation hole Check the front panel and back panel ventilation hole of the product for dust or stain.

[Page 64: Periodical Inspection](#)

To prevent accidents and use the product safely for long-term operation, it is recommended performing a periodical inspection every 6 months. Also, it is recommended replacing life limited parts regularly (refer to "6.2 Life limited parts"). For a periodical inspection, consult with one of Toshiba's service representatives. Life Limited Parts To use the product safely for a long time, replace the life limited parts regularly.

[Page 65](#) Chapter 6 Maintenance and Inspection 6FE8C1621...

[Page 66](#) Chapter 7 Application Interface This chapter describes information by socket, transmission path diagnosis information, JTNI state information, and usage constraints of the application interface. Information by Socket [Reserved] 59 7.1.1 Configuration of information by socket 59 7.1.2 Referring to information by socket 60 7.1.3 Timing of generation of information by socket ...

[Page 67](#) Chapter 7 Application Interface The JTNI expands the state information by socket used by the user application as well as diagnosis information of the transmission path to the JTNI within the same network on the station bus. Different is the address on the station bus expanding each state information.

[Page 68: Information By Socket \(Reserved\)](#)

The following table shows the station bus address where the information by socket is expanded in word addresses. Table 7-1 Station bus addresses Word offset Socket 0 130944 Socket 1 130945 Socket 2 130946 · · Socket 62 131006 Socket 63 131007 Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 69: Referring To Information By Socket](#)

Chapter 7 Application Interface The base address of the station bus address varies depending on the slot where the JTNI is installed. The following table shows the starting word addresses of the information by socket when the JTNI is installed to different slots. Table 7-2 Slots and station bus addresses Beginning of single Base address...

[Page 70: Timing Of Generation Of Information By Socket](#)

(Note) When running the controller and then halting it, close is requested by the controller basic software for the socket used by the controller. Figure 7-3 Information by socket and clear timing (1) Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 71](#) Chapter 7 Application Interface The timing of setting and clearing bit information of information by socket is shown below. Information by socket [Passive] [] <POP> <CON> <RCV> <RCL> Open Reception Close [] [] request request request []...

[Page 72: Transmission Path Diagnosis Information](#)

2016 2047 2046 2045 2044 2043 2042 2041 2040 2039 2038 2037 2036 2035 2034 2033 2032 (Note) BL 25 shows scan block No.25 Figure 7-5 Configuration of Scan healthy map Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 73: Configuration Of The Scan Data Unhealthy Map](#)

Chapter 7 Application Interface 7.2.2 Configuration of the scan data unhealthy map The scan data healthy map is managed in the configuration as shown in Figure 7-6. The scan data healthy map shows the state history information of the corresponding scan data blocks. Bit "1"...

[Page 74: Configuration Of The Scan Data Talker Map](#)

Scan block No. 2046 Overlapping source address sending station address Scan block No. 2047
Scan block No. 2047 overlapping source address sending station address Figure 7-7
Configuration of the scan data talker map Unified Controller nv-pack series TC-net
100(JTNI)Extended card Instruction Manual...

[Page 75: Configuration Of Ras Information](#)

Chapter 7 Application Interface 7.2.4 Configuration of RAS information In the RAS information
area, the information for all nodes is shared. The state information of each node is updated
periodically, which consists of 64 words per node. The configuration information depends on the
node type. The information of each node is expanded at the position of the station number x
128 bytes from the beginning of the RAS information area by 64 words.

[Page 76](#) A0 is Stack 0 of A system HUB (Note 2) Number of received packets has number
of each port normal packets in 16 bits. It transits in 65535→0→1→2... Figure 7-9 Configuration of
RAS information on HUB Unified Controller nv-pack series TC-net 100(JTNI)Extended card
Instruction Manual...

[Page 77: Configuration Of In-Ring Map](#)

Chapter 7 Application Interface 7.2.5 Configuration of in-ring map The in-ring map indicates the
state of the stations that belong to the TC-net 100. The in-ring map shows the stations that are
currently on the network. If an error occurs in the TC-net 100 network or in the JTNI itself, the in-
ring map is cleared to zero.

[Page 78: Usage Constraints](#)

7.3 Usage Constraints Usage Constraints Port number constraints The TN8 module reserves the
following ports. Port number 10000: PCMP Use port numbers from 1024 to 65535 other than
above. Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

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TC-net 100 Transmission Specifications 70 A.3 Function Specifications
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[Page 81: General Specifications](#)

Appendix A Specifications A.1 General Specifications Table A-1 General specifications
Specification Item JTNI61/62 5 to 40 ° C Operating temperature (Ambient temperature)
Operating humidity 20 to 80%RH (without condensation) Dust density 0.3mg/m or less (no
conductive dust) (equivalent to JEITA-IT-1004A Class B) Should not be detected Corrosion
resistance (equivalent to JEITA-IT-1004A Class A)

[Page 82](#) Dedicated slot 1 slot No. of installation Max. 2 cards/main unit Insulation resistance
10MΩ or more (500 VDC) Dielectric strength 500 VAC for 1 minute (signal line) Weight 200g or
less Unified Controller nv-pack series TC-net 100(JTNI)Extended card Instruction Manual...

[Page 83: Tc-Net 100 Transmission Specifications](#)

Appendix A Specifications A.2 TC-net 100 Transmission Specifications Table A-2 TC-net 100
transmission specifications Item Specification Media access method DOMA(Deterministic
Ordered Multiple Access) method Data transmission speed 100Mbps Topology Star Transmission
path Single bus Redundant bus Transmission cable/cable Optical fiber cable 2km length (Total
extension is 8km if laser LEDs and optical fiber single mode are used)

[Page 84: Function Specifications](#)

A.4 Serial Communication Port (RS-232C) Transmission Specifications A.3 Function
Specifications Table A-3 Function specifications Item Specification Point-to-point transmission
Transmission method Multicast transmission Broadcast transmission Monitoring function
(RAS) Hardware/software Unified Controller nv-pack series TC-net 100(JTNI)Extended card
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[Page 85](#) Appendix A Specifications 6F8C1621...

[Page 86](#) Appendix B Outside Dimensions...

[Page 87](#) Appendix B Outside Dimensions The following figure shows the outside dimensions of the JTNI. Figure B-1 JTNI outside dimensions 6F8C1621...

[Page 88](#) Appendix C Related Products...

[Page 89](#) Appendix C Related Products Table C-1 Related products Product name Rating Remark Optical fiber cord with MT-RJ Optical fiber cord Cable in board optical connector at both ends 6F8C1621...

[Page 90](#) Appendix D Decimal-hexadecimal Conversion Table...

[Page 91](#) Appendix D Decimal-hexadecimal Conversion Table Table D-1 Decimal-hexadecimal conversion table Decimal Hexadecimal Decimal Hexadecimal Decimal Hexadecimal Decimal Hexadecimal 6F8C1621...

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This manual is also suitable for:

Tc-net 100