Toshiba PROSEC T2 Series User Manual

Modbus module

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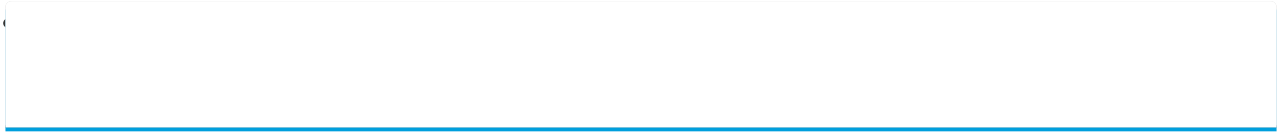

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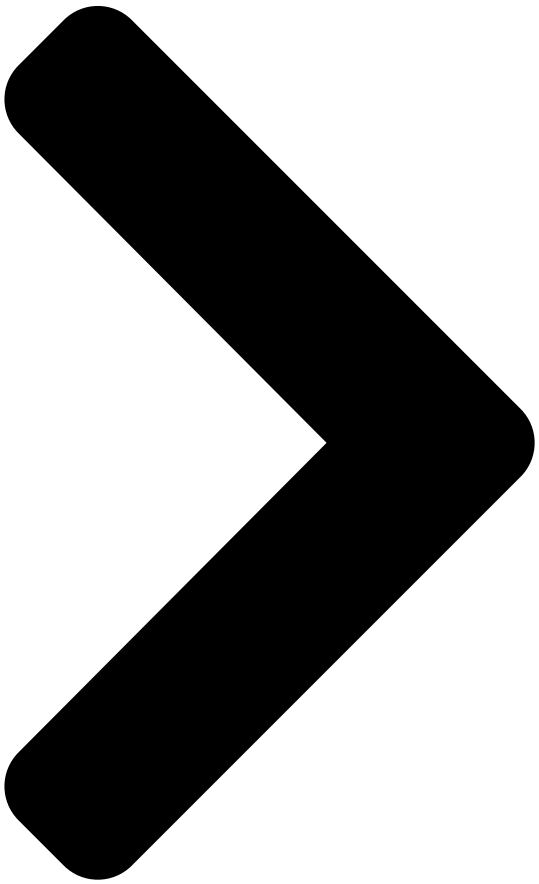

UG-TS02∗∗∗-E022

PROGRAMMABLE CONTROLLERS

TOSHIBA

T2-Series

PROSEC

USERS MANUAL

− Modbus Module −

TOSHIBA CORPORATION

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Related Manuals for Toshiba PROSEC T2 Series

Controller Toshiba NV Series Hardware Manual

Unified controller (177 pages)

Controller Toshiba Prosec T-Series Operation Manual

Prosec t-series programmable controller, handy programmer (157 pages)

Network Hardware Toshiba T1 Using Manual

Toshiba modem user manual (6 pages)

Network Hardware Toshiba T2N Instruction Manual

Cpu module ethernet port (179 pages)

Network Hardware Toshiba TOSLINE-S20 Instruction Manual

Tosline-s20 active star coupler (41 pages)

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

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Network Hardware Toshiba V Series User Manual

(60 pages)

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Network Hardware Toshiba S2T Setup Manual

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Interface (2 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 PROSEC T2 Series

Page 1: Users Manual

UG-TS02∗∗∗-E022 PROGRAMMABLE CONTROLLERS T2-Series PROSEC USERS MANUAL − Modbus Module − TOSHIBA CORPORATION...

Page 2: Important Information

Because controlled system applications vary widely, you should satisfy yourself as to the acceptability of this equipment for your intended purpose. In no event will Toshiba Corporation be responsible or liable for either indirect or consequential damage or injury that may result from the use of this equipment.

Page 3: Safety Precautions

Safety Precautions This application guide is prepared for users of Toshiba programmable controller PROSEC T2-Series and EX100 Series (hereafter called T2). Read this guide and your PLC's manual thoroughly to use the PLC system safely. Hazard Classifications In this guide, the following two hazard classifications are used to explain the safety precautions.

Page 4: About This Guide

About This Guide This guide describes how to setup and use the Toshiba EX10-MML11 Modbus module. When used in a Modbus network, the EX10-MML11 module allows any Modbus master to write to/read from the registers in an EX100 or T2 PLC using standard Modbus RTU protocol.

Page 5: Table Of Contents

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Page 7: Overview

TPU245N-S T2N CPU, with Ethernet and Tosline S20 The ML11 Modbus module is also used to connect a T2 or EX100 PLC into the Toshiba ECBUS. The ECBUS allows the PLCs to share data with Toshiba’s EC300 series loop controllers. The ECBUS is a LAN (local area network) which allows multiple EC300s and T2/EX100 PLCs to share data.

Page 8: System Configuration

2. System Configuration From 1 to 32 T2E or T2N PLCs can be connected to a Modbus master using the Modbus module. 1 to 1 Configuration RS485 T2E PLC Modbus Master 1. Higher Level PLC 2. Distributed Control System 3. Computer with SCADA or I/O Modules Modbus Module T2 Minimum...

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1. Higher Level PLC 2. Distributed Control System 3. Computer with SCADA or HMI Program T2 Maximum Configuration 1 Main Unit 3 Exp. Units Up to 32 Stations For high-speed data transfer, one of Toshiba’s Tosline Data Highway modules is recommended. Page 3...

Page 10: External Features And Switch Settings

3. External Features and Switch Settings Page 4...

Page 11: Specifications

4. Specifications ITEM INTERFACE COMMUNICATION STYLE SIGNAL CONFIGURATION SYNCHRONIZATION NETWORK TOPOLOGY COMMUNICATION SPEED TRANSMISSION DISTANCE COMMUNICATION MODE DATA LENGTH STOP BITS PARITY STATION NUMBER ERROR CHECK NUMBER OF CHANNELS SPECIFICATION TERMINAL BLOCK HALF-DUPLEX TXA/RXA TXB/RXB START-STOP PARTY LINE (MULTIDROP) 300, 600, 1200, 2400, 4800, 9600, 19200 bps 1 KM MAX RTU MODE 8 BITS...

Page 12: Modbus Module Operation

5. Modbus Module Operation 5.1. Modbus Commands When a MODBUS command is used, the Modbus module translates it to the corresponding T2 register access protocol. MODBUS FUNCTION CODE Read Coil Status Read Input Status Read Holding Register Read Input Register Force Single Coil Force Single Register Loop Back Diagnostic test...

Page 13: Modbus Data Types And T2 Register Mapping

5.2. Modbus Data Types and T2 Register Mapping This table shows how the different Modbus data types are mapped into T2 registers. In other words, a Modbus master would reference the following Modbus register ranges to access the corresponding T2 PLC registers. For example, Modbus Holding Register 4352 will map to T2 register D000, and Input Register 0000 will map to

XW00.

Page 14: Restricted Registers

Modbus – T2 Address mapping Example: Input module (XW000) T2E CPU Modbus Module Modbus Address 30000 40001 44352 Note: When dealing with I/O registers, make sure that the Modbus master is attempting to access only the I/O points that physically exist in the T2 system. For example, Holding Register 0 (40000) does not exist in the above example because there is no YW000 in the T2 system.

Page 15: Modbus Module Setup

The Toshiba Modbus module has been used reliably as a Modbus slave for several years. First it was used on Toshiba's EX100 Series PLCs and now on the T2 Series PLCs. Before it can function as intended however, all the DIP switches must be properly set and all wiring connections must be correct.

Page 16 Transmission Rate (Baud Rate): Select the combination of the three switches "BR2", "BR1", and "BRO" for the desired communication speed. These are the 4th, 5th, and the 6th switches. Baud Rate 19200 9600 4800 2400 1200 RESERVED Page 10...

Page 17 Parity Check: Select the parity check as odd, even or none. Use switches 7 and 8 to set the parity. PARITY NONE EVEN ASY and DLY switches: The ASY and DLY switches are not used on the EX10-MML11, and should be set to the "Off"...

Page 18 Example Configuration Settings: This section shows how to set the card up for network station address 2, 9600 baud, and no parity. "ASY and DLY" Set these to the Off position. "Station Address" •Set the Station number on the rotary switch to 2. •...

Page 19 "Parity check" For No Parity, the following settings are required. • PEN is off. • EVN is off. Switch settings for 9600 baud, no parity, and address less than 16. Page 13...

Page 20: Wiring Connection To The Modbus Module

6.2. Wiring Connection to the Modbus Module Sometimes it is necessary to convert from the standard RS485 to RS232 for connection to a Personal Computer. The wiring between the Modbus module and the converter must be set as follows: RS485 Converter Note: Different RS485 converters have different connections.

Page 21: Cpu Setup For The Modbus Module

7. CPU Setup for the Modbus Module Two lines of ladder logic are necessary to configure a T2 CPU for use with the Modbus module. 1 Communications Priority: To insure uninterrupted communications between the CPU and the Modbus module, the communications priority bit S0158 must be set ON. 2.

Page 22: Trouble Shooting

8. Trouble Shooting The communication status LEDs can be used to verify correct operation of the Modbus module. During normal operation, the LED indicators flash as follows: • RXD LED: Flashes when the Modbus master sends a message to the EX10 -MML11.

Page 23: Additional References

9. Additional References Toshiba Corporation, Instruction Manual - EC300 Series Controller – ECBUS Transmission Interface Module – ML11. 6F8A0613 4 ed. Feb 1995. Tokyo, Japan. Toshiba Corporation, Computer Link Function Operation Manual. UM-TS03-E008, 3 Aug. 1977. Tokyo, Japan. Gould Modicon, Modbus Protocol Reference Guide.

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This manual is also suitable for:

Prosec t2-series