
PanelMate® Toshiba T2 Communication Driver Manual

Preface

Information in this manual is subject to change without notice and does not represent a commitment on the part of Eaton's Cutler-Hammer, Inc. Permission is granted to duplicate this material without modification only for your use or the internal use of other members of your company or your agents to assist you in the use and servicing of products purchased from Eaton's Cutler-Hammer. No permission is granted to modify this material or include this material in a compilation.

RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure by the Government is subject to restrictions set forth in paragraph (b)(3)(B) of the Rights in Technical Data and Computer Software clause of DAR 7-104.9(a). Contractor/Manufacturer is Eaton Corporation's Cutler-Hammer Business Unit, 811 Green Crest Drive, Columbus, OH 43081.

TRADEMARKS

PanelMate is a federally registered trademark of Eaton Corporation. MS-DOS, Microsoft, and Windows are federally registered trademarks of Microsoft Corporation. Data Highway and Data Highway Plus are trademarks of Allen-Bradley. DeviceNet is a trademark of Open DeviceNet Vendor Association. Iomega is a federally registered trademark of Iomega Corporation.

Commercial brand names (trademarks) of products of manufacturers or developers, other than Eaton Corporation or its affiliates, that appear in this manual may be registered or unregistered trademarks of those respective manufacturers or developers, which have expressed neither approval nor disapproval of Cutler-Hammer® products and services.

©2002 Eaton Corporation. All rights reserved.

Printed in the United States of America.

P/N 01-00463-02

Support Services

The goal of Eaton's Cutler-Hammer business unit is to ensure your greatest possible satisfaction with the operation of our products. We are dedicated to providing fast, friendly and accurate assistance. That is why we offer you so many ways to get the support you need. Whether it's by phone, fax or mail, you can access Eaton's Cutler-Hammer support information 24 hours a day, seven days a week. Our wide range of services are listed below.

You should contact your local distributor for product pricing, availability, ordering, expediting and repairs.

Website Address www.cutler-hammer.eaton.com

Use the Cutler-Hammer website to find product information. You can also find information on local distributors or Cutler-Hammer sales offices.

e-TRC

**Technical Resource Center
(support for OI, PLC & IPC)**

VOICE:

- 800-809-2772, selection 5 (8:00AM-5:00PM EST)
- 414-449-7100, selection 5 (8:00AM-5:00PM EST)

FAX: 614-882-0417

EMAIL: CHATechSupport@eaton.com

AFTER-HOURS PLANT DOWN EMERGENCY:

- 800-809-2772, selection 5 (5:00PM-8:00AM EST)
- 414-449-7100, selection 5 (5:00PM-8:00AM EST)

If you are in the US or Canada, and have OI/PLC/IPC questions, you can take advantage of our toll-free line for technical assistance with hardware and software product selection, system design and installation, and system debugging and diagnostics. Technical support engineers are available for calls during regular business hours.

Information Fax-Back Service **VOICE: 614-899-5323**

The latest Cutler-Hammer product information, specifications, technical notes and company news are available to you via fax through this direct document request service. Using a touch-tone phone, you can select any of the info faxes from our automated product literature and technical document library, enter a fax number and receive the information immediately.

**Repair and Upgrade Service
(support for OI & IPC)**

VOICE:

- 800-809-2772, selection 5 (8:00AM-5:00PM EST)
- 414-449-7100, selection 5 (8:00AM-5:00PM EST)

FAX: 614-882-3414

EMAIL: RepairCHA@eaton.com

If you have questions regarding the repair or upgrade of an OI/IPC, contact your local distributor. Additional support is also available from our well-equipped Repair and Upgrade Service department.

**European PanelMate Support
Center**

VOICE: +41 1 806 64 44 (9:00AM-5:00PM CET)

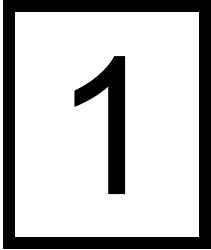
EMAIL: CHSupport@bfa.ch

This center, located in Zurich, Switzerland, provides high-level quality support and product repair services for your PanelMate products. You will receive real-time technical and application support.

Table of Contents

Introduction.....	4
Introduction	5
Installing Drivers	5
Downloading Drivers to a PanelMate Unit.....	6
Serial Transfer Cables	6
Memory Types.....	8
Memory Ranges.....	9
Possible Configurations	10
Direct Connection.....	11
Multidrop Connection.....	11
Cabling.....	12
Cable Configurations.....	13
RS232 Cabling for Toshiba T2 PLCs.....	13
RS422 Cabling for Toshiba T2 PLCs.....	13
Communication Parameters	14
Standard Communication Parameters.....	15
Word and Bit References	16
Word Referencing Method	17
Register Reference Format	17
Examples	18
Maintenance Access.....	19
Maintenance Access	20
Error Codes	21
Remote Errors.....	22
Index.....	23

Introduction



In this chapter, you will learn:

- *About driver installation*
- *How to download drivers to a PanelMate unit*
- *The supported memory types*

Introduction

The Operator Station can be used with Toshiba T2 model PU224 PLCs. The Operator Station supports RS232 communications through the Programming Port and RS422 multidrop communications through the Computer Link Port.

Note: Check the Cutler-Hammer web site for current information on PanelMate PC connectivity to the Toshiba T2 driver.

Installing Drivers

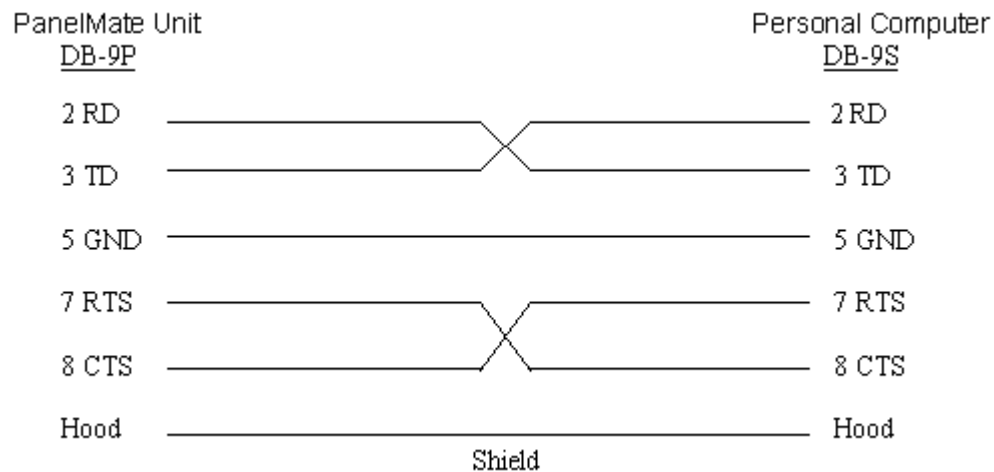
PanelMate Configuration Editor software is installed using a CD-ROM. To install the drivers from the CD-ROM, select the **Install Software** option and then **Install Drivers**. From the dialog box, select the driver you wish to install.

Downloading Drivers to a PanelMate Unit

- In the VCP Transfer Utility, choose the “Executive” tab and select the proper Executive Firmware to download to the PanelMate unit.
- Click the button labeled “Add to Operation List.”
Note: In order to download to a PanelMate for the first time or to clear the existence of another driver, the PanelMate must first be loaded with Executive Firmware.
- Choose the “Driver” tab.
- Select the appropriate driver to be downloaded to the PanelMate.
- Click the button labeled “Add to Operation List.”
- Place the PanelMate unit in Serial Transfer Mode.
- Connect a serial transfer cable from the correct port on the PC to port 1 on the PanelMate. (See cabling below.)
- Click “Start” at the bottom of the VCP Transfer Utility window.
- **Note:** For a more detailed description of downloading procedures and troubleshooting see *PanelMate Power Series, PowerPro, Pro LT Transfer Utility User’s Guide*.

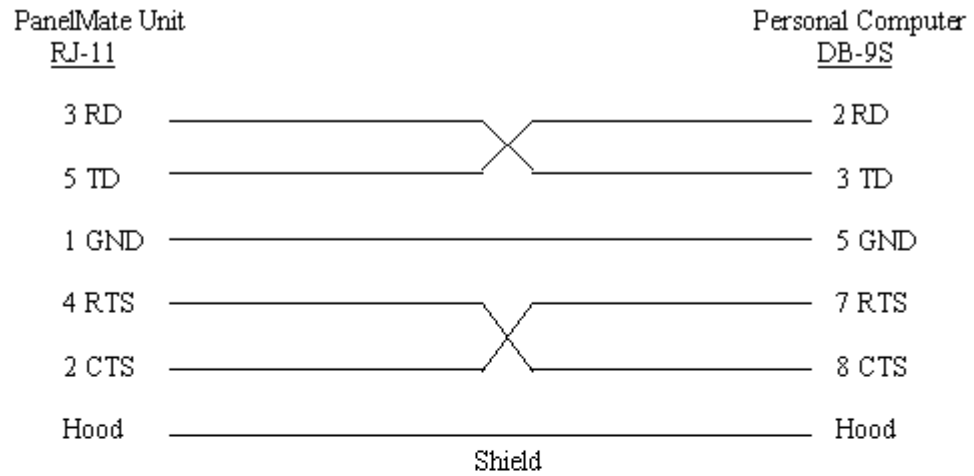
Serial Transfer Cables

Cable P/N 0518

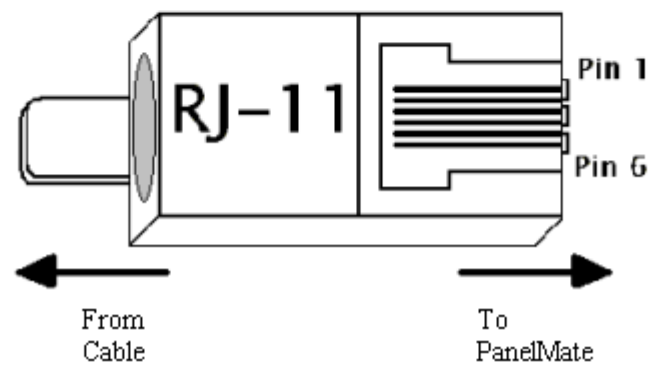


Cable P/N 0818

(PanelMate Power Series 1500 and PanelMate 500 only)



RJ-11 pin configuration



Memory Types

The Toshiba T2 driver supports the following memory types:

Memory Type	Memory Address
Word	
XW	Input register (read only)
YW	Output register
RW	Auxiliary register
ZW	Remote Link Storage register
T	Timer register (read only)
C	Counter register (read only)
D	Data register

Memory Type	Memory Address
Bit	
X	Input device (read only)
Y	Output device
R	Auxiliary device
Z	Remote Link Storage device

Memory Ranges

The following table shows the memory types and ranges supported by the Toshiba T2.

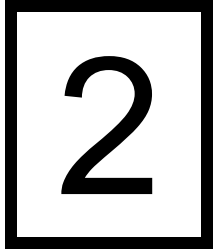
Memory Types	Memory Ranges
Word	
Input register (read only)	XW00-XW63
Output register	YW00-YW63
Auxiliary register	RW000-RW127
Remote Link Storage register	ZW0000-ZW1023
Timer register (read only)	T000-T255
Counter register (read only)	C000-C255
Data register	D0000-D4095

Memory Types	Memory Ranges
Bit	
Input device (read only)	X000-X63F
Output device	Y000-Y63F
Auxiliary device	R000-R127F
Remote Link Storage device	Z000-Z511F

Note: Bit reads and writes to word memory types are not allowed. To access bits, you must use the bit memory types.

Note: The maximum data value for the timer register is 32767.

Possible Configurations

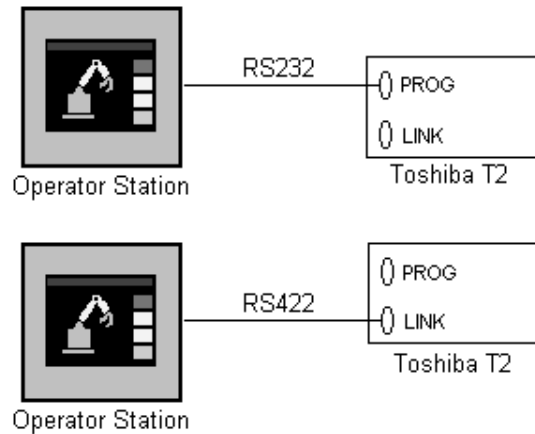


In this chapter, you will learn:

- *How to connect an operator station to Toshiba T2 PLCs*

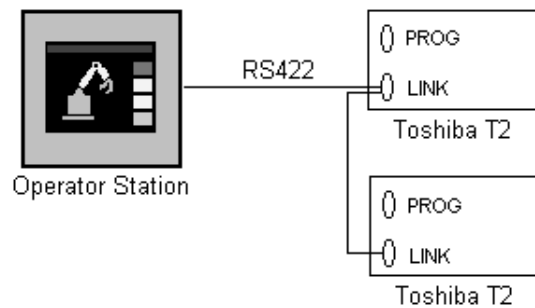
Direct Connection

A direct connection may be made to either the Programming Port of the Computer Link Port on the Toshiba T2 PLC.



Multidrop Connection

Multiple PLCs may be connected to the Computer Link Port on the Toshiba PU224 CPU unit.



Note: Six additional Toshiba T2 PLCs may be added to the network.

Cabling

3

In this chapter, you will learn:

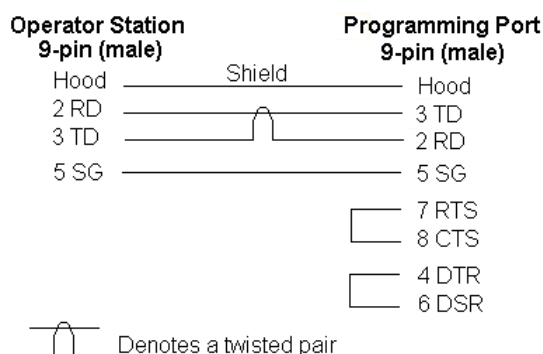
- *The cabling requirements for Toshiba T2 PLCs*

Cable Configurations

Communications between the Operator Station and the Toshiba T2 PLC can be RS232 or RS422. The Toshiba T2 PLC has 2 communications ports. Both ports may be used to connect to the Operator Station. The Programming Port is an RS232 connection and the Computer Link Port is an RS422 connection. The maximum cable length when using RS232 is 50 feet, while the maximum cable length for RS422 is 4000 feet. The RS422 cable must be a twisted double-wire shielded cable.

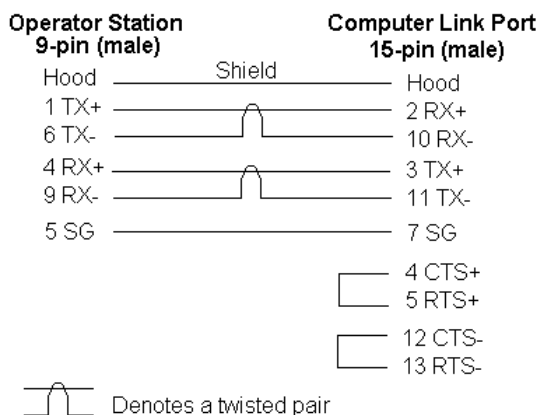
The Operator Stations that have 9-pin female connectors (DB-9S) must have cables configured with male connectors (DB-9P).

RS232 Cabling for Toshiba T2 PLCs



Note: The Programming Port on the Toshiba T2 PLC can only be used for direct connections.

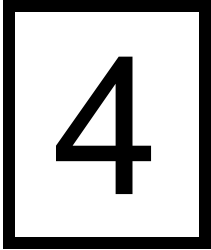
RS422 Cabling for Toshiba T2 PLCs



Note: The Computer Link Port on the Toshiba T2 PLC can be used for a direct connection or for multidrop connections. See the Toshiba Computer Link function Operation Manual for more cabling options.

Note: Termination is required for a direct connection. The Toshiba T2 PLC requires a $\frac{1}{2}$ W 120 Ohm resistor across pin 2 RX+ and 10 RX-.

Communication Parameters



In this chapter, you will learn:

- *The standard communication parameters*

Standard Communication Parameters

The standard communication parameters for communicating to the Programming Port on the Toshiba T2 PLC are:

- RS232
- 9600 Baud Rate
- 8 Data Bits
- 1 Stop Bit
- Odd parity

Note: It is recommended to configure the Operator Station Local ID field to 0 (zero) and the PLC Remote ID field to 1.

Note: Unsolicited messages are not supported.

The standard communication parameters for communicating to the Computer Link Port on the Toshiba T2 PLC are:

- RS422
- 9600 Baud Rate (selectable)
- 8 Data Bits (selectable)
- 1 Stop Bit (selectable)
- No parity (selectable)

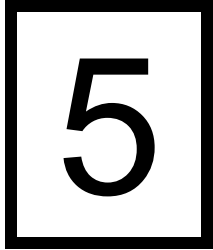
Note: The PLC ladder logic programming software allows for all selectable settings to be changed. All selectable settings must match those set in the PLC.

Note: It is not recommended to set the baud rate to 19200

Note: The Operator Station is the master in all communications operations and its Local ID should be set to either 0 or 1.

Note: Unsolicited messages are not supported.

Word and Bit References



In this chapter, you will learn:

- *How to configure word and bit references*

Word Referencing Method

The general word referencing method is:

[plcname,word#format]

The "plcname" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional if you are using the default PLC and do not wish to change the data format, respectively.

The general bit referencing method is:

[plcname,bit]

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See the "Word and Bit References" topic in the Configuration Software Online Help for a more detailed explanation of word and bit references, including format descriptions.

Register Reference Format

The Toshiba T2 PLC uses decimal word addresses. The Operator Station format default is U16.

The format used for expressions is the memory type symbol (upper or lower case) and a reference number.

The following is the format for a register reference.

[WWXXX]

WW	Memory type XW, YW, RW, ZW, T, C, D, X, Y, R, Z
XXX	Memory address (leading zeros not required).

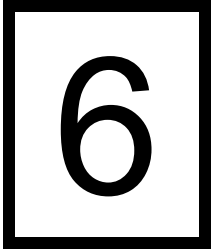
Examples

The following are examples of valid PLC references that may be assigned in the Operator Station expression fields.

Word References	
[XW8]	Input register 8
[YW11]	Output register 11
[RW063]	Auxiliary register 63
[ZW14]	Remote Link Storage register 14
[T30]	Timer register 30
[C019]	Counter register 19
[D2048]	Data register 2048

Bit References	
[X01A]	Input device, bit 10 of Input register 1
[Y34C]	Output device, bit 12 of Output register 34
[R441]	Auxiliary device, bit 1 of Auxiliary register 44
[Z140]	Remote Link Storage device, bit 0 of Remote Link Storage register 14

Maintenance Access



In this chapter, you will learn:

- *How to use the Maintenance Template*

Maintenance Access

The Maintenance Template will access all memory locations supported by the driver as defined in the Memory Addressing topic. When running on-line, you can change the reference. The Maintenance Template is designed to assist you in specifying the reference by scrolling through a list of mnemonics that are used to enter the word reference. When online in the reference change mode, the following list is available.

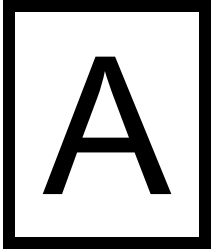
“XW” “YW” “RW” “ZW” “T” “C” “D” “X” “Y” “R” “Z”

You must enter the correct mnemonics and numeric values and create a legal reference to change a reference.

Note: When a new reference is entered on an Operator Station, the Maintenance Template will remain in a paused state until the **Start Monitor** control button or the **Chng** soft function key is pressed. When the **Start Monitor** control button or the **Chng** soft function key is pressed, the Operator Station will parse the reference. (Parsing means checking the syntax and range of the reference to ensure that it is supported by the driver.)

Note: Maintenance Templates cannot be used to monitor unsolicited references.

Error Codes



In this chapter, you will learn:

- *About Toshiba T2 specific errors*

Remote Errors

The Toshiba T2 has 3 remote errors that can be generated. In each instance, the probable cause is a bad communications link. Check the cable and connectors.

Error	Error Name	Description
01	Command error	Received command is illegal
02	Format error	Received text format is illegal
03	Checksum error	Checksum mismatch is detected

For a complete list of errors, refer to the Online Operation User's Guide.

Index

C

Cable Configurations, 13

D

Direct Connection, 11

Downloading Drivers to a PanelMate Unit, 6

E

Examples, 18

I

Installing Drivers, 5

Introduction, 5

M

Maintenance Access, 20

Memory Ranges, 9

Memory Types, 8

Multidrop Connection, 11

R

Register Reference Format, 17

Remote Errors, 22

RS232 Cabling, 13

RS422 Cabling, 13

S

Serial Transfer Cables, 6

Standard Communication Parameters, 15

W

Word Referencing Methods, 17

Reader Comment Card

Cutler-Hammer strives to provide quality user guides and product manuals. Please take a moment to fill out this comment card.

Title: **Toshiba T2 Communication Driver Manual 01-00463-02**

	Excellent	Good	Fair	Poor
Is the document easy to follow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the product work as described in this document?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the instructions easy to follow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the examples helpful/useful?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are there enough examples?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the document organized logically?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is it easy to find what you are looking for?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the illustrations clear and useful?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How would you improve this document?

Please list any errors found in this document:

Other comments:

Your name and address: (optional)

Thank you for your comments. Please fax this page to:

Cutler-Hammer Technical Publications Dept.

FAX : 614-882-0417