

TOSHIBA

UM-TS03***-E045

PROGRAMMABLE CONTROLLER

PROSEC **T-SERIES**

PROGRAM DEVELOPMENT SYSTEM

T-PDS32 for Windows
Version 2.2

BASIC OPERATION MANUAL

TOSHIBA CORPORATION

Important Information

Misuse of this equipment can result in property damage or human injury. 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.

No patent liability is assumed by Toshiba Corporation with respect to use of information, illustrations, circuits, equipment or examples of application in this publication.

Toshiba Corporation reserves the right to make changes and improvements to this publication and/or related products at any time without notice. No obligation shall be incurred other than as noted in this publication.

This publication is copyrighted and contains proprietary material. No part of this book may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means – electrical, mechanical, photocopying, recording, or otherwise – without obtaining prior written permission from Toshiba Corporation.

© TOSHIBA Corporation 1997-2002. All rights reserved.

Publication number: UM-TS03***-E045
3rd edition October 2002

Microsoft, Windows, WindowsNT are registered trademarks of Microsoft Corporation.
IBM is a registered trademark of International Business Machines Corporation.
Ethernet is a registered trademark of Xerox Corporation.

Preface	3
Preparations and Checks	5
Operating Environment	5
T- PDS32 Installation	6
Before Operation	9
Screen Configuration	9
Selecting Functions	10
Menu Configuration	11
Toolbar Configuration	17
Key Operation	18
Key Assignment to the Instruction bar	21
Basic Operation	22
1. Procedure	22
1.1 Sample Program	22
1.2 Procedure	23
2. Starting Up the T-PDS32	24
2.1 System Startup	24
2.2 Changing the PLC Operation Mode	25
2.3 Switching Between Online and Offline Mode	27
2.4 Opening a New Project	29
2.5 Opening an Existing Project	30
3. Programming	31
3.1 Clear Memory	31
3.2 Registering System Parameters	32
3.3 Registering I/O Cards	36
3.3.1 When I/O Cards are Installed	38
3.3.2 When No I/O Card is Installed	38
3.3.3 Checking Register Numbers	40

Contents

3.4	Programming	41
3.4.1	Programming screen	41
3.4.2	Creating Circuit 1	42
3.4.3	Creating Circuit 2	45
3.4.4	Finishing the Program	47
3.4.5	Writing the Program	48
3.4.6	Correcting the Instruction	49
4.	Program Execution	51
4.1	Executing the Program	51
4.2	Checking Operation	52
5.	Advanced Editing	53
5.1	Inserting Circuits	53
5.2	Setting Data	57
5.3	Deleting Circuits	60
5.4	Complex Circuits	62
6.	Saving Programs	63
6.1	Save to Disk	63
6.2	Loading Programs from Disk	65
7.	Beyond the Basics	66
7.1	Register/Device Comment	66
7.1.1	Select Comment File	66
7.1.2	Registering Names	68
7.1.3	Displaying Names	70
7.2	Sampling Trace	71
7.2.1	Setting the Sampling Buffer	71
7.2.2	Setting the Sampling Condition	72
7.2.3	Viewing Sampling Trace Data	75
7.2.4	Timing Chart Display	76
7.3	Printing the Program	78
Index		81
Error Message		83
List of Instructions		106

Preface

About the T-PDS32 for Windows

The T-PDS32 for Windows (hereafter called T-PDS32) is the programming support software for PROSEC T-series programmable controllers (PLCs). The T-PDS32 is used to create program, load the program into PLC, monitor the execution status, debug the program, and for documentation. It is also useful for the PLC maintenance.

T-PDS32 for Windows runs on the Microsoft Windows 95/98/Me/NT4.0/2000/XP platform. It allows all programming operations to be done using the mouse, including program creation; copy, move, delete and other editing operations; and setting/changing of monitoring data (program operation status, current data values, etc.). The T-PDS32 provides an efficient program development.

T-PDS32 Versions

This manual is prepared for T-PDS32 Version 2.2x.

The table below shows the version history of the T-PDS32.

Version	Release date	Major revisions
2.0	Aug. 1999	Initial release of 32-bit version (T-PDS32) for Windows 95, 98 and NT4.0
2.1	Dec. 1999	<ul style="list-style-type: none"> • Error handling improvements (Jump to the error position, jump to offset address, etc.) • Jump to next/prev block support for T1-series PLC
2.11	Mar. 2000	<ul style="list-style-type: none"> • Block/rung comment improvements • Documentation improvements
2.12	Jan. 2001	<ul style="list-style-type: none"> • For Windows 95, 98, Me, NT4.0, 2000 • Connection retry for T1-series non parity setting • Force setting color indication • Improvement of Timer/Counter search in offline
2.13	Oct. 2001	<ul style="list-style-type: none"> • S2T support • Coil cross-reference print with ladder program
2.14	Mar.2002	<ul style="list-style-type: none"> • For Windows 95, 98, Me, NT4.0, 2000 and XP • Improvement of communication time-out processing • Event history file output function • Online monitor window size expansion • Improvement of usage map with ATOH instruction
2.20	Oct. 2002	<ul style="list-style-type: none"> • CD-R version • Toolbar improvement • S2T - C2 data exchange setting function • Improvement of block merge

About This Manual

This manual explains basic information of T-PDS32, how to install and the basic operations using the T-PDS32. For details of each functions and operations, refer to the T-PDS32 online Help.

Preface

Related Manuals

The following related manuals are available T-series PLC. Read the manuals for your PLC model for your better understanding.

T-series common:

T-series Instruction Set	UM-TS03***-E004
T-PDS32 for Windows Operation manual (Ver. 2.2)	UM-TS03***-E045 (This manual)
T-series Computer Link Operation Manual	UM-TS03***-E008
Handy Programmer (HP911) Operation Manual	UM-TS03***-E025
DDE Server Software (T-PSV)	UM-TS03***-E044

T1/T1S:

T1-16S User's Manuals - Basic Hardware and Function	UM-TS01***-E031
T1-16S User's Manuals - I/O Modules	UM-TS01***-E034
T1-16S User's Manuals - Communication Function	UM-TS01***-E033
T1/T1S User's Manuals - Basic Hardware and Function	UM-TS01***-E001
T1/T1S User's Manuals - Expansion I/O	UM-TS01***-E002
T1/T1S User's Manuals - Communication Function	UM-TS01***-E003

T2E/T2N:

T2E User's Manual	UM-TS02E**-E001
T2N User's Manual	UM-TS02N**-E001
T2E/T2N Enhanced Communication Function	UM-TS02E**-E003
T2 Analog I/O Module (AD268/DA264/TC218)	UM-TS02***-E026
T2 2-Channel Pulse Input Module (PI232/272)	UM-TS02***-E021
T2 2-Axis Motion Control Module (MC212)	UM-TS02***-E018
T2 Communication Interface Module (CF211)	UM-TS02***-E013

T3/T3H:

T3 User's Manual - Hardware	UM-TS03***-E002
T3 User's Manual - Function	UM-TS03***-E003
T3H User's Manual	UM-TS03***-E032
T3 Analog Input Module (AD368/AD318/AD328/AD338)	UM-TS03***-E016
T3 Analog Output Module (DA364/DA374)	UM-TS03***-E017
T3 Pulse Input Module (PI312)	UM-TS03***-E018
T3 ASCII Module (AS311)	UM-TS03***-E020
T3 Change Detect DC Input Module (CD332)	UM-TS03***-E024

S2T:

S2T User's Manual - Hardware	6F8C0926
S2T User's Manual - Function	6F8C0928

Network:

T2N Ethernet function	6F3B0362
Ethernet Module (EN311) for T3H	6F3B0361
TOSLINE-S20 - T2/T3 Station	6F3B0354
TOSLINE-S20 - SIF Station	6F3B0352
TOSLINE-S20 - Active Star Coupler ASC22	6F3B0358
TOSLINE-S20 - Active Star Coupler ASC25	6F3B0360
TOSLINE-S20LP - T2N/T3H Station	6F3B0356
TOSLINE-S20/S20LP - S2T Station	6F8C0890
TOSLINE-S20/S20LP - Loader software S-LS for Windows	6F3B0357
DeviceNet Scanner Module for T2 (DN211A)	6F3B0364
DeviceNet Scanner Module for T3 (DN311A)	6F3B0363
DeviceNet Scanner Module for S2T (DN611A)	6F8C1043
DeviceNet Wizard for Toshiba	-
TOSLINE-F10 User's Manual - T2/T3 System	UM-TLF10**-E001

Preparations and Checks

Operating Environment

The T-PDS32 for Windows program runs on a PC/AT compatible computer with the specifications shown in the table below.

Category		Specification
OS	Operating System	Windows 95 Windows 98 SE Windows Me WindowsNT4.0 SP3 Windows 2000 Windows XP
CPU	Main Processor	Min. Pentium 150 MHz (MMX Pentium 200MHz or faster)
Memory	RAM	Min. 32MB (64MB or more)
Display	Display unit	Color/gray scale monitor 16 colors or more
	Graphics monitor	Min. 640 x 480 pixels VGA/SVGA (800 x 600 pixels or more)
Input device	Keyboard	101 keys/84 keys
	Mouse	PS2 or serial
Disk drive	Hard disk drive	Min. 80MB
	CD-ROM drive	For setup only
Interface	RS-232C ^{*1}	9600bps
	Printer	Mono or Color Printer
	LAN	Ethernet

(): Recommended

*1: USB/Serial adapter is not guaranteed. It may cause unstable communication between T-PDS and PLC. If your computer has no serial port, it is recommended to use an RS-232C PCMCIA card.

T- PDS32 Installation

T- PDS32 Installation

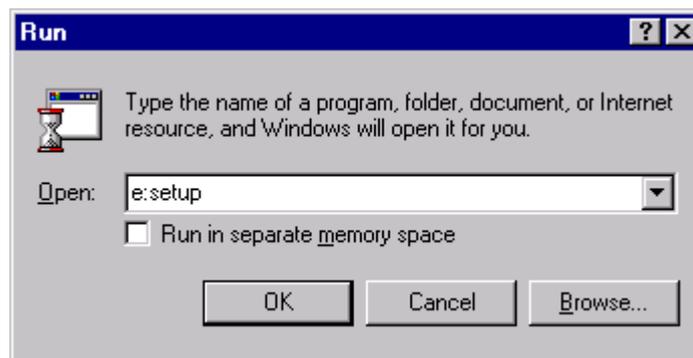
The T-PDS32 installation files are provided by a CD-ROM.

Use the following procedure to install the T-PDS32 for Windows program.

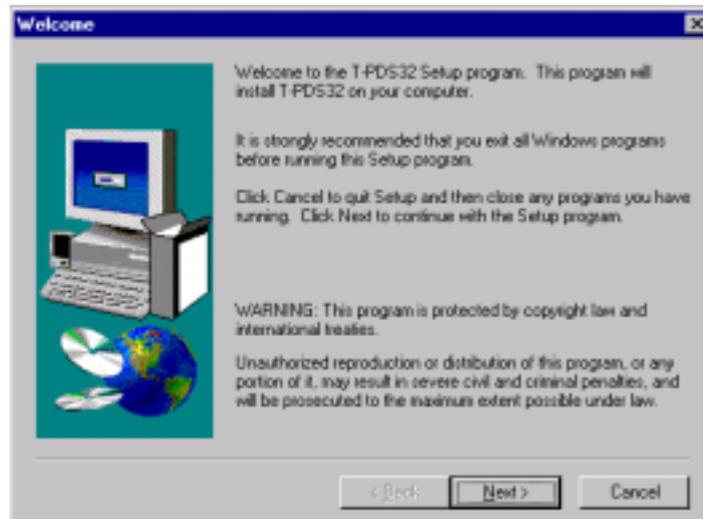
The following steps describe the procedure used to install the T-PDS32 into the hard disk drive C.

On machines with a different drive configuration, change the drive names as needed.

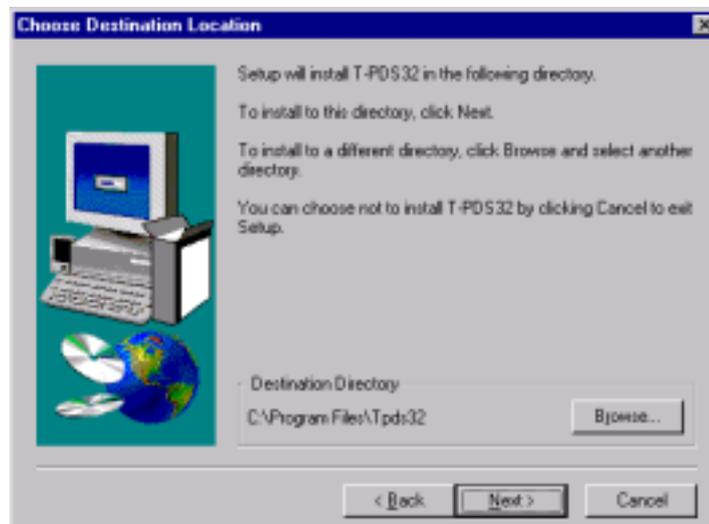
- (1) Startup the Windows operating system.
- (2) Insert the T-PDS32 CD-ROM. (Drive E in this example)
- (3) Point to the Start Bar and then click Run....
- (4) In the command line box, enter e:\setup.exe and click OK. Then the T-PDS32 installer program will be started.



- (5) When the installation environment is complete, the following dialog box will appear. Click Next.



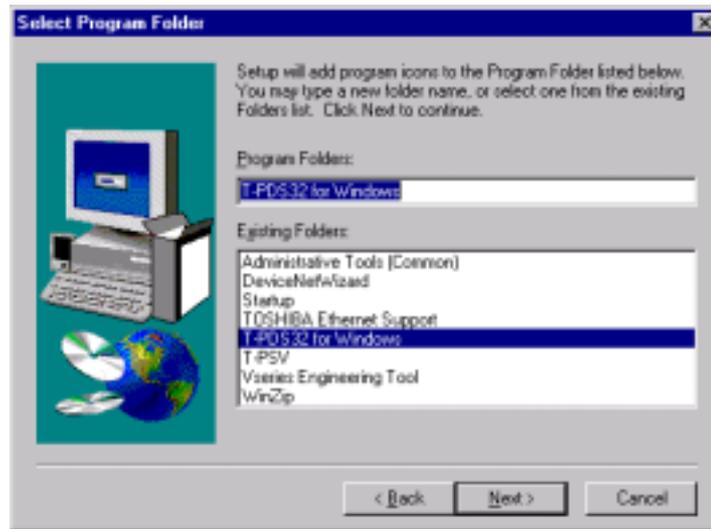
- (6) The Destination Location dialog box will appear. The default option for the destination is "C:\Program Files\Tpd32". To change the destination directory, you must enter a new directory. Click Browse. A dialog box for selecting the drive and directory will appear. Select the directory from the list. Then click Next.



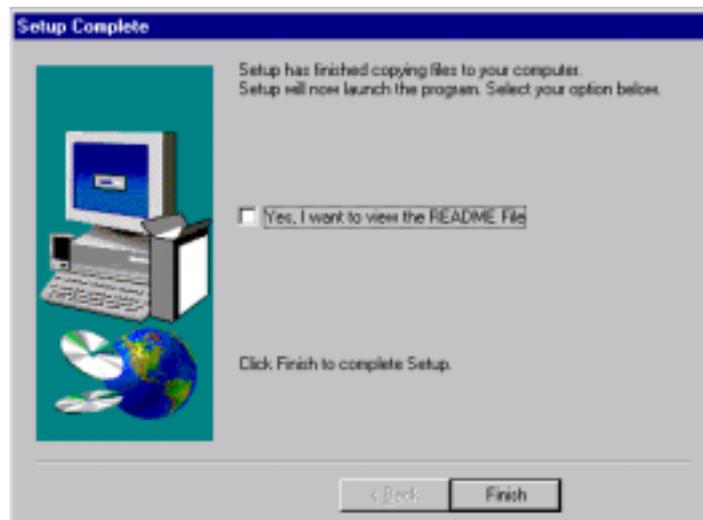
T-PDS32 Installation

- (7) The Program Folder dialog box will appear. The default option for the folder name is "T-PDS32 for Windows". To change the folder name, you must enter a new folder name.

When preparations for installation are complete, click Next. To cancel the installation process, click Cancel.



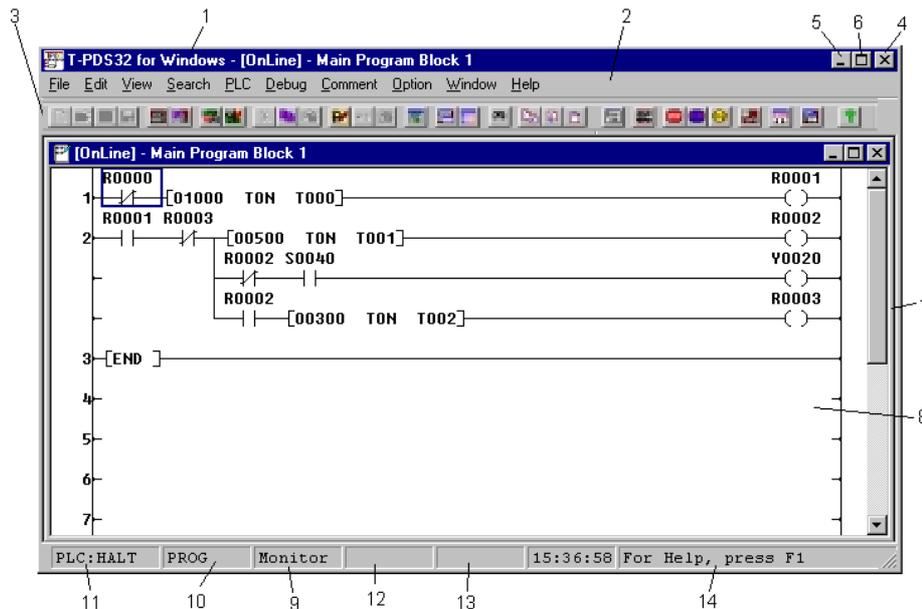
- (8) When installation of T-PDS32 for Windows is completed properly, the execution files and other files will be registered in the T-PDS32 for Windows folder.



Before Operation

Screen Configuration of T-PDS32 for Windows

The configuration for the main window screen is described below.



- 1 - Title bar: Shows the name of the window.
- 2 - Menu bar: Shows the names of the main menus.
- 3 - Toolbar: Displays icons for tools that can be used. You can hide the toolbar by changing the Toolbar setting on the View menu.
- 4 - Control-menu box: Clicking this button closes the window.
- 5 - Reduce button: Clicking this button shrinks the window so it is displayed as an icon.
- 6 - Restore button: This button appears when the window fills the entire screen. Clicking the button restores the window to its original size.
- 7 - Client area: This area shows the data for the selected function.
- 8 - Work window: The work area for the selected function.
- 9 - Current command: Shows the currently selected command.
- 10 - Status: Shows programming enable or protected status of the controller.
- 11 - Operational status: When the T-PDS32 is online mode, "PLC" appears in the status bar, followed by the operational mode of the controller. "OFFLINE" appears when the T-PDS32 is offline mode.
- 12 - Insert/Overwrite: In Edit mode, this shows whether insert or overwrite mode. It can be controlled by [Ins] key.
- 13 - SFC line number: Shows the SFC line number of the cursor position (at SFC programming).
- 14 - Help message: Shows help messages pertaining to the toolbox.

Before Operation

Selecting Functions

In the T-PDS32 for Windows program, you can select operational modes using the main menus on the menu bar.

[File]	Used to open, save and print projects and to quit the program. Program load/save between the PLC is under this menu.
[Edit]	Used to write a program, modify the program, and online write into the PLC.
[View]	Used to display the data monitor window, change the data display format, zoom in/out the program display, etc.
[Search]	Used to perform the search function for designated operand and/or instruction, and jump to the designated location in the program.
[PLC]	Used to monitor/set the PLC system parameter, monitor the maintenance information, control the PLC mode, etc. The T-PDS32 online/offline mode selection is under this menu.
[Debug]	Used for program debugging functions such as force, data set/reset, sampling trace, etc.
[Comment]	Used to edit/display the comment. Comment conversion to/from CSV file is also available.
[Option]	Used to display cross-reference, usage-map and force list. The T-PDS32 connection method selection and some customize function are under this menu.
[Window]	Used to open or change the display status of windows.
[Help]	Used to access the help function and display the version data.

Menu items may be selected either by using the mouse or by pressing keys on the keyboard.

Using the mouse: Move the mouse pointer on the item in the menu bar and click the left mouse button.

Using the keyboard: Press the Alt key and select the menu, then use the cursor keys to select the desired menu item and press Enter key.

Menu Configuration

[File] Used to open, save and print projects and to quit the program.
 Program load/save between the PLC is under this menu.

New Project	Opens a new project
Open Project	Opens an existing project
Save Project	Saves changes to the project
Save Project As	Saves the project under a different name
Close Project	Closes the project
Compare Project	Compares the PLC program with another project
Multiple Projects	Opens another project
Print	Prints the project
Print Preview	Shows a preview of printing
Print Setup	Used to choose the printer settings
Transfer Program	Transfers the project between PLC and disk file
Program Block Read	Appends the program blocks to the editing program
Recent File List	Shows a list of recently accessed files
Exit	Quits the program

Before Operation

[Edit] Used to write a program, modify the program, and online write into the PLC.

Edit Mode		Changes the mode to Edit mode
Undo		Recovers the last edit operation
Cut		Cuts the circuit (Ladder)
Copy		Copies the circuit (Ladder)
Paste		Pastes the circuit (Ladder)
Insert	Line	Inserts a line (ladder)
	Rung	Inserts a rung (ladder)
	Column	Inserts a column (SFC)
Delete	Line	Deletes a line (ladder)
	Rung	Deletes a rung (ladder)
	Column	Deletes a column (SFC)
Direct		Used to edit the transition/action directly (SFC)
Edge/Digit/ Index	Edge	Used to set/release Edge execution setting
	Digit	Used to set/release Digit designation
	Index	Used to set/release Index modification
Change Language		Selects the language either Ladder or SFC
Block	Edit Block	Edits the program in block units (Block copy/move)
	Merge Block	Merges the block with another
	Divide Block	Divides the block
Function	Change Device	Changes register or device
	Replace Address	Search and replace the designated registers or devices
Check Program		Checks the program
Write		Writes the edited program into PLC (online) or into internal memory (offline)

[View] Used to display the data monitor window, change the data display format, zoom in/out the program display, etc.

Tool Bar	Displays/hides the toolbar
Status Bar	Displays/hides the status bar
Data Box	Displays the data box to set data
Auxiliary Monitor	Displays auxiliary data monitor window. (simultaneous monitor with program execution)
Data Monitor	Displays the data monitor window (32 words data)
Data Format	Changes the data display format
Trace Format	Changes the trace display format
Zoom In/Out	Enlarges/reduces the display size
Fit To Window	Fit the display to the window size

[Search] Used to perform the search function for designated operand and/or instruction, and jump to the designated location in the program.

Find	Searches for designated register/device in the program	
Rung	Start of Block	Moves to the first rung in the block
	End of Block	Moves to the last rung in the block
Block	Start of Program	Moves to the first block of the program type
	End of Program	Moves to the last block of the program type
	Next Block	Moves to the next block
	Previous Block	Moves to the previous block
Goto	Used to display the designated program type and block	

Before Operation

[PLC] Used to monitor/set the PLC system parameter, monitor the maintenance information, control the PLC mode, etc. The T-PDS32 online/offline mode selection is under this menu.

System Parameters		Monitors/edits the system parameters
I/O Allocation	I/O Allocation	I/O module allocation data
	Interrupt Assignment	Interrupt assignment data
	Network Assignment	Link data allocation for network module
Event History		Reads and displays the PLC's event history
Scan Time		Reads and displays the scan time
Power Interruption		Used to set the power interruption function
C2 Access Setting		Used to set the register allocation for data exchanging between S2T and C2
Memory Management	Clear Event	Clears the event history
	Clear Memory	Clears entire PLC memory
	Clear IC Card	Clears the IC card memory
	Read EEPROM/IC Card	Loads program from EEPROM or IC card and stores it in PLC's memory
	Write EEPROM/IC Card	Writes PLC memory program into the built-in EEPROM or IC card
Password	Change Protect Level	Changes the level accessible with the password
	Set Password	Sets a password
PLC Control	Halt	Stops the program execution
	Run	Starts the program execution
	Force Run	Starts the program execution without checking I/O mounting status
	Error Reset	Resets the PLC error status
	Hold	Stops the program execution with keeping I/O update
	Hold Cancel	Cancel hold mode and returns to Run
	Float Box	Displays/hides the PLC control box
Online/Offline		Toggles the mode between Online and Offline

[Debug] Used for program debugging functions such as force, data set/reset, sampling trace, etc.

Force	Used to set force input or force coil
Set On/Off	Used to set data into the register/device
Change Value	Used to write data into the register or change the constant operand value
Sample Trace	Used to execute the sampling trace function
Status Latch	Used to execute the status latch function
Data Validity Check	Used to execute the bit-pattern check function

[Comment] Used to edit/display the comment. Comment conversion to/from CSV file is also available.

View		Displays/hides the comment on the program
Edit	Block Comment	Edits block comments
	Rung Comment	Edits rung comments
	Reg/Dev Comment	Edits register/device comments
Append	Program Comment	Appends the block/rung comment from the existing comment file
	Reg/Dev Comment	Appends the register/device comment from the existing comment file
Convert		Converts the comment file to/from CSV file
Select Comment File		Selects the reference comment file in online mode

[Option] Used to display cross-reference, usage-map and force list. The T-PDS32 connection method selection and some customize function are under this menu.

Cross Reference		Shows the cross reference list
Usage Map		Shows the register/device usage map
Forced List		Shows the list of forced inputs/coils
Instruction Box		Sets the instruction bar option
Communication		Sets communication method between PLC
Customize	Comment Font	Customizes the comment font
	Color Set	Customizes the color
	User Instruction	Customizes the user Instruction group

Before Operation

[Window] Used to close or change the display status of windows.

New Window	Opens a new program window
Cascade	Displays windows overlapped in cascading fashion
Tile	Displays windows side by side in tiled fashion
Arrange Icons	Changes window into icon
Close All	Closes all open windows
List of Open Windows	Displays/hides a list of open windows

[Help] Used to access the help function and display the version number.

Contents	Displays help categories
Search on Help	Searches help by key word
About T-PDS for Windows	Displays the version data

Toolbar Configuration



The toolbar contains the most frequently used functions.

	[File] [New Project]	Opens a new project
	[File] [Open]	Opens an existing project
	[File] [Save]	Saves changes to a project
	[File] [Save Project As]	Saves the project under a different name
	[File] [Print]	Prints the program
	[File] [Print Preview]	Displays the print preview
	[File] [Program Transfer] [PLC→File]	Uploads the program from PLC to file
	[File] [Program Transfer] [File→PLC]	Downloads the program from file to PLC
	[Edit] [Cut]	Cuts the rungs
	[Edit] [Copy]	Copies the rungs
	[Edit] [Paste]	Pastes the rungs
	[Edit] [Edit Mode]	Selects/deselects program edit mode
	[Edit] [Undo]	Recovers the last edit operation
	[Edit] [Write]	Writes the program into PLC or offline memory
	[View] [Data Box]	Displays the data box
	[View] [Auxiliary Monitor]	Displays the auxiliary monitor window
	[View] [Data Window]	Displays the data monitor window
	[Search] [Find]	Searches operand and/or instruction
	[Search] [Go to]	Moves to the designated location
	[Search] [Block] [Previous Block]	Moves to the previous block
	[Search] [Block] [Next Block]	Moves to the next block
	[PLC] [Event History]	Displays the event history
	[PLC] [Memory Management] [Write EEPROM]	Executes EEPROM write command
	[PLC] [PLC Control] [Halt]	Executes HALT command
	[PLC] [PLC Control] [Run]	Executes RUN command
	[PLC] [PLC Control] [Error Reset]	Executes Error Reset command
	[PLC] [Online/Offline]	Switches T-PDS32 mode online/offline
	[Comment] [Comment Format]	Displays comments on the program
	[Window] [New Window]	Opens program window
	[Help]	Calls online help

Before Operation

Key Operation

Described below are the key functions of the T-PDS32.

<<File>>

- Ctrl + N Opens a new project.
- Ctrl + O Opens an existing project.
- Ctrl + S Saves on the same file name.
- Ctrl + A Saves as a new file.
- Ctrl + P Prints out
- Alt + F4 Ends the T-PDS32

<<Common to program view and edit (Ladder/SFC's Action and Transition)>>

- [→] Moves the cursor to right.
- Shift + [→] Moves the cursor to the extreme right.
- [←] Moves the cursor to left.
- Shift + [←] Moves the cursor to the extreme left.
- [↑] Moves up the cursor to the line above.
- [↓] Moves down the cursor to the line below.
- Shift + [↓] Selects a range from the cursor rung. (up to 11 lines)
- Shift + [↑] Cancels the selected range.
- Home Moves the cursor to the first rung of the block.
- End Moves the cursor to the last rung of the block. (for ladder only)
- PageUp Scrolls up the circuit. (for ladder only)
- PageDown Scrolls down the circuit. (for ladder only)
- Shift + PageUp Moves to the previous block.
- Shift + PageDown Moves to the next block.
- Ctrl + E Edit mode/Edit quit
- Ctrl + C Copies a range of the program.

<<Common to program view and edit (SFC)>>

- [→] Moves the cursor right.
- [←] Moves the cursor left.
- [↑] Moves up the cursor to the line above.
- [↓] Moves down the cursor to the line below.
- Home Moves the cursor to the home position.
- End Moves the cursor to the last symbol position.
- PageUp Moves up the cursor to the 12 lines above.
- PageDown Moves down the cursor to the 12 lines below.
- Ctrl + E Edit mode/Edit quit

<<Program edit (Ladder/SFC's Action and Transition)>>

- Shift + 0 to 8 Specifies the digit designation. (Q0 to Q8)
- Shift + Ctrl + 0 to 8 Cancels the digit designation. (Q0 to Q8)
- Shift + I, J, K Specifies the index modification. (I, J, or K)
- Shift + Ctrl + I, J, K Cancels the index modification. (I, J, or K)
- Shift + P Specifies/cancels the edge execution modifier.
- Ctrl + H Changes constant operand input format. (Decimal/hexadecimal)
- Insert Changes overwrite/insert mode.
- Delete Deletes instructions.
- Space Clears operand.
- Enter Enters the instruction. If blank, inserts a line blow cursor.
- Shift + Enter Inserts a line below the cursor position. (for ladder only)
- Ctrl + Z Undoes the recent edit operation. (for ladder only)
- Ctrl + X Cuts a range of the program. (for ladder only)
- Ctrl + C Copies a range of the program. (for ladder only)
- Ctrl + V Pastes a cut or copied program. (for ladder only)
- Ctrl + W Writes the edited program. (for ladder only)
- Shift + C Erases circuits. (for ladder only)
- Shift + X Deletes lines. (for ladder only)
- Esc Cancels the edit process.

<<Program edit (SFC)>>

- Insert Changes overwrite/insert mode. (toggle)
- Delete Deletes symbols.
- Space Clears operand.
- Enter Enters the operand and confirms it.
- Shift + [↓]
Shift + [↑] Selects lines from the symbol on the cursor position.
Cancels the selected line.
- Ctrl + W Writes programs
- Esc Cancels the edit process.

<<Data Monitor>>

- [→] Moves forwards between blocks.
- [←] Moves backwards between blocks.
- [↑] Scrolls up the block.
- [↓] Scrolls down the block.
- PageUp Scrolls by the block size in the decrement direction.
- PageDown Scrolls by the block size in the increment direction.
- Home Moves the cursor to the first address of the block.
- End Moves the cursor to the last address of the block.
- Enter Edits the data value at the cursor position. (in data box)

Before Operation

<<Auxiliary monitor>>

- [→] Moves forwards between blocks.
- [←] Moves backwards between blocks.
- [↑] Scrolls up the block.
- [↓] Scrolls down the block.
- PageUp Scrolls by the block size in the decrement direction.
- PageDown Scrolls by the block size in the increment direction.
- Home Moves the cursor to the first address of the block.
- End Moves the cursor to the last address of the block.
- Enter Registers the data address to the cursor position and edit the data value. (in data box)
- Delete Deletes the registration.

<<Comment window>>

- [↑] Scrolls up the screen.
- [↓] Scrolls down the screen.
- PageUp Scrolls up by 32 addresses..
- PageDown Scrolls down by 32 addresses.
- Home Moves the cursor to the first address.
- End Moves the cursor to the last address.
- Enter Edits the tag/comment at the cursor position. (in data box)

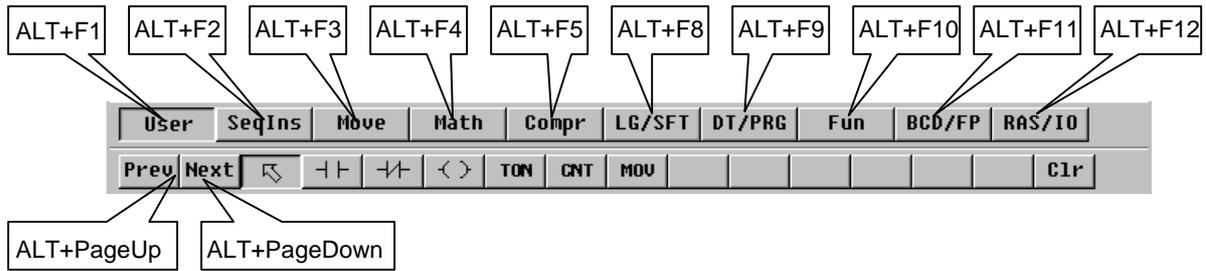
<<Debug>>

- Ctrl + 1 Sets the device ON.
- Ctrl + 2 Resets the device OFF.
- Ctrl + 3 Sets force the device.
- Ctrl + 4 Resets force the device.

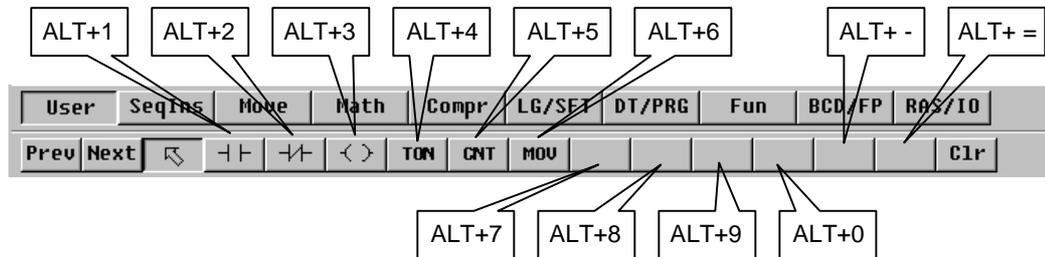
Key Assignment to the Instruction bar

The instruction type and instruction toolbar buttons have a shortcut key allocated.

The instruction type can be selected by pressing one of the following shortcut keys.



The instruction will be pasted to the cursor position by pressing the following shortcut keys.



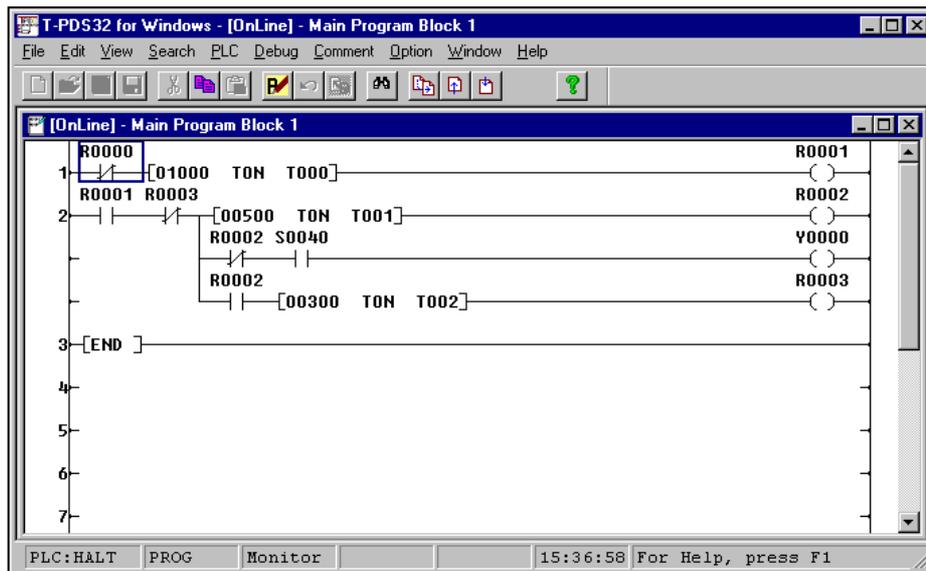
1. Procedure

Basic Operation

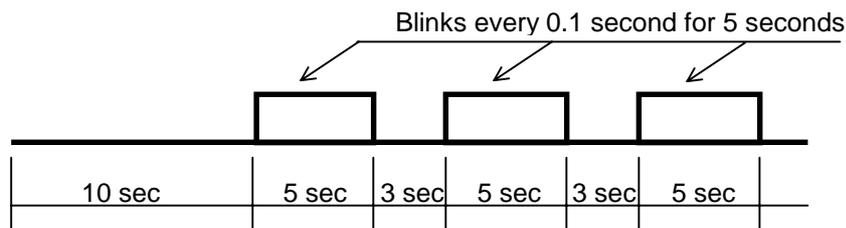
1. Procedure

1.1 Sample Program

In this manual, the operation of the T-PDS32 is explained through the process of creating a control program for the flicker circuit shown below.



- Flicker Circuit Operation
10 seconds after startup, the flicker circuit blinks for 5 seconds at 3-second intervals.



Contact S0040 is a special relay (timing relay) that goes on and off every 0.1 second. During its 5-second operation it turns the device (output coil) on and off every 0.1 second.

When there is an I/O card (D0334 and R0364 [T3], D031 and D032/R061 [T2] or other output module), it should be installed in slot 0.

Program execution can be checked on the module operation LEDs. Program creation and execution is possible even if the I/O card is not installed.

1.2 Procedure

This manual describes how to create the program for the flicker circuit using the following procedure.

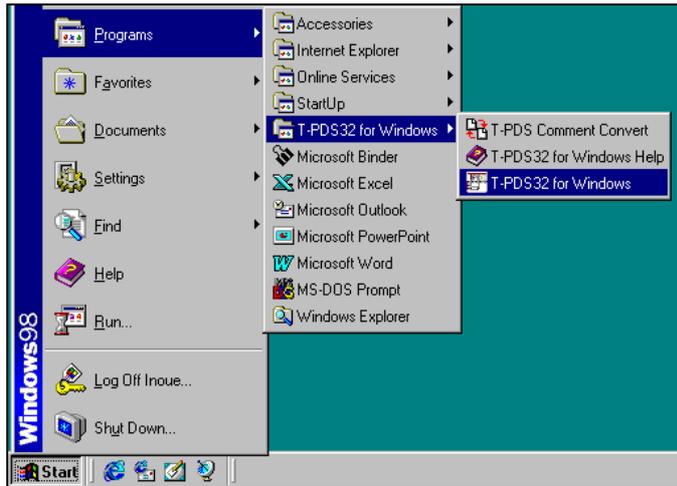
- | | |
|------------------------------|--|
| Check system configuration | - Check the program for the flicker circuit. |
| Connect controller | - Connect the controller to the programmer. |
| Starting up T-PDS32 | - Launch the programmer. |
| Register system control data | - Register the control parameters for the flicker circuit. |
| Register I/O card | - Register the I/O card to be used with the flicker circuit. |
| Programming 1 | - Place symbols and write operands to create a sample program. |
| Write program | - Write the program to the controller. |
| Execute program | - Execute the program and check the operation on the Program screen and the Register All screen. |
| Check operation 1 | |
| Check operation 2 | |
| Insert circuit | - Insert a circuit and change some of the sample program functions. |
| Set data | - Execute the corrected program and then change some of the data being executed and check operation. |
| Delete circuit | - Delete a portion of the circuit and finish the revised program. |
| Save program | - Save the program on a floppy disk. This section also discusses how to load programs from the floppy disk. |
| Helpful function | - This section describes how to name the registers for the program, sample the operational status and check it on a time chart, debug programs and print out programs. |

2. Starting Up the T-PDS32

2. Starting Up the T-PDS32

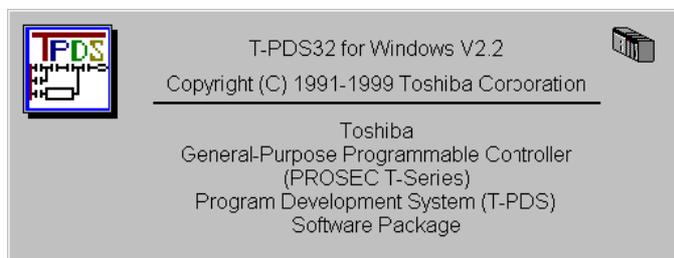
2.1 System Startup

You need to connect the programmer to the controller before starting up the system. The cable can be connected to the controller while it is running or power on.

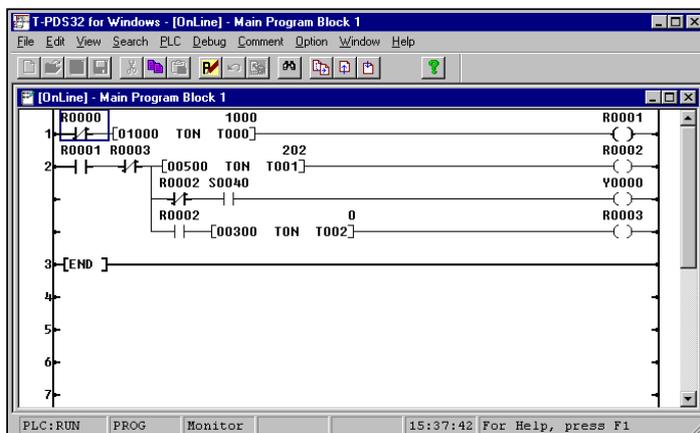


Connect the male connector of the dedicated cable to the [PROG] connector on the CPU module of the T-series controller.

To launch the T-PDS32 for Windows program, double-click the T-PDS32 icon in the T-PDS32 group. Only one project is opened when the program is launched.



When the system starts up, the title screen will appear, followed by the default screen.

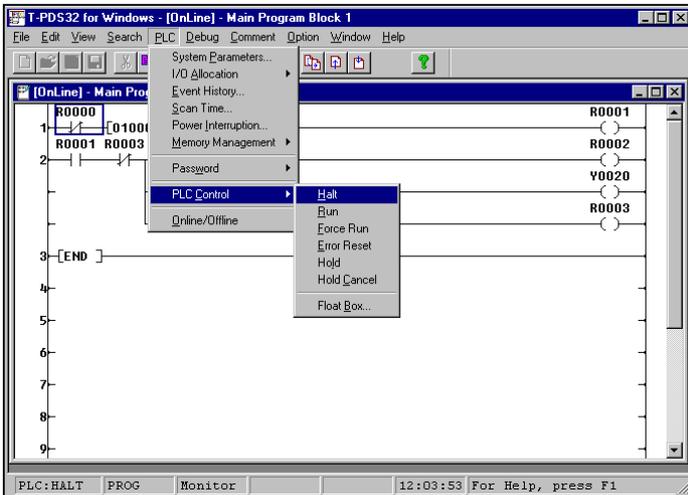


After a while, the base system programs of the controller appear.

If the programmer is not connected properly to the controller through the dedicated cable, a screen in offline mode appear.

2. Starting Up the T-PDS32

2.2 Changing the PLC Operation Mode



The operational status of the controller can be changed from the programmer as well as by using the operation selector switch on the CPU module.

To change the operation mode using the programmer, point to PLC Control in the PLC menu. Another submenu will appear containing a list of controller operation modes.

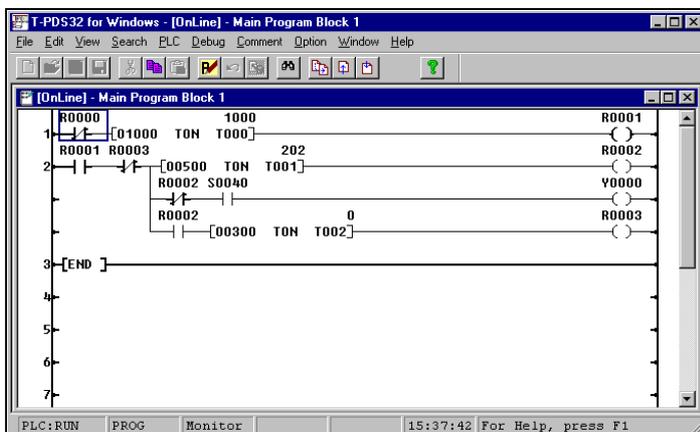
There are six controller operation modes

- Halt
- Run
- Force Run
- Error Reset
- Hold
- Hold Cancel

Click the desired mode.



A dialog box will appear, asking you to confirm that you want to change the controller operation mode. Click OK.



The controller will change to the designated mode. Check the mode displayed at the bottom of the screen.

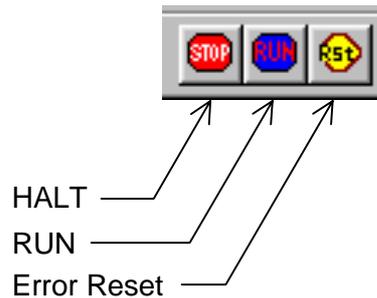
2. Starting Up the T-PDS32

Additional Information

Using the toolbar to control the PLC operation mode

The PLC operation mode can be changed at any time when the PLC Control toolbar is displayed.

When you click one of the buttons in the toolbar, a dialog box will appear, asking you to confirm the mode change.



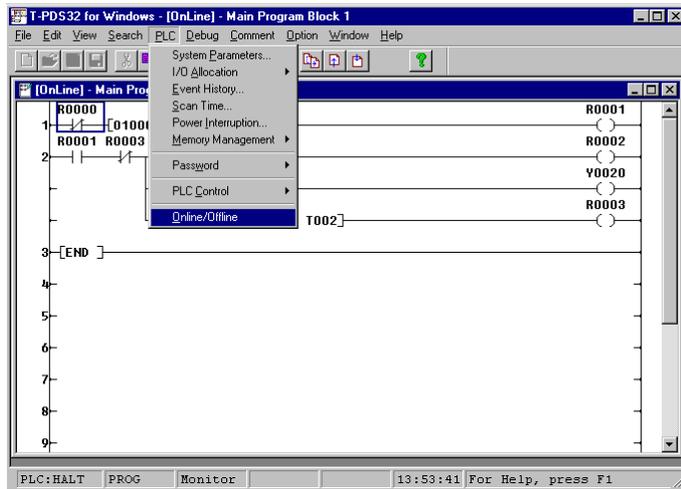
Click OK to change the mode. Click Cancel to cancel the operation.

The operation mode can be changed from the T-PDS32 only when the operation switch on the controller is set to RUN or P-RUN. If an attempt is made to change the mode from the T-PDS32 when the operation switch is set to HALT, a "Mode Unmatch" message will appear. Set the operation switch to RUN or P-RUN and then repeat the mode changing procedure. If the controller cannot be operated properly (in other words, if the mode cannot be changed to RUN), a message explaining the cause will appear.

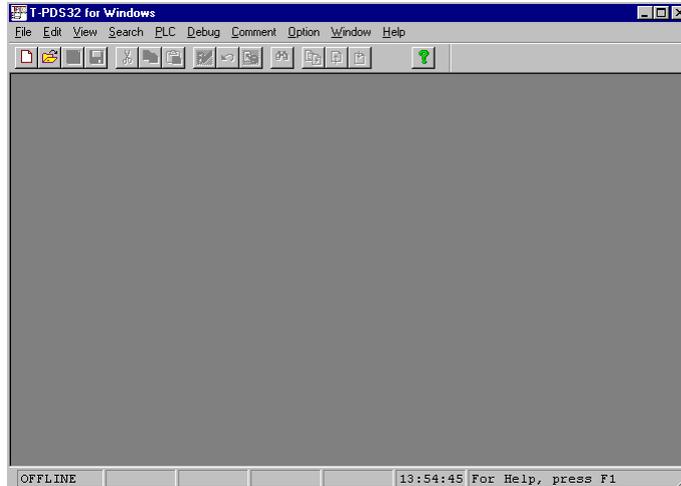
2. Starting Up the T-PDS32

2.3 Switching Between Online and Offline Mode

In addition to creating programs and setting data in online status, with the programmer and controller connected, the T-PDS32 for Windows program can also be used to create and edit programs in offline mode with the programmer alone.



To change the online/offline mode, use Online/Offline on the PLC menu. Clicking Online/Offline toggles the status to the opposite of the current status. When the status is changed from Offline to Online, a project for that controller opens and the program for the first block is displayed.

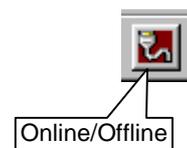


No project is displayed when the status is changed from Online to Offline. You have to create a new project or open an existing project for editing in offline mode.

Additional Information

Using the toolbar to change Online/Offline

You can change the T-PDS32 operation mode between online and offline by clicking the tool button. (Toggle)



2. Starting Up the T-PDS32

Additional Information

1. The difference in operation between online and offline are as follows:

Online: The T-PDS32 reads/writes program and data with the connected PLC memory.

The T-PDS32 reads/writes comments either in the specified comment file or in the PLC memory (T3/T3H/S2T only).

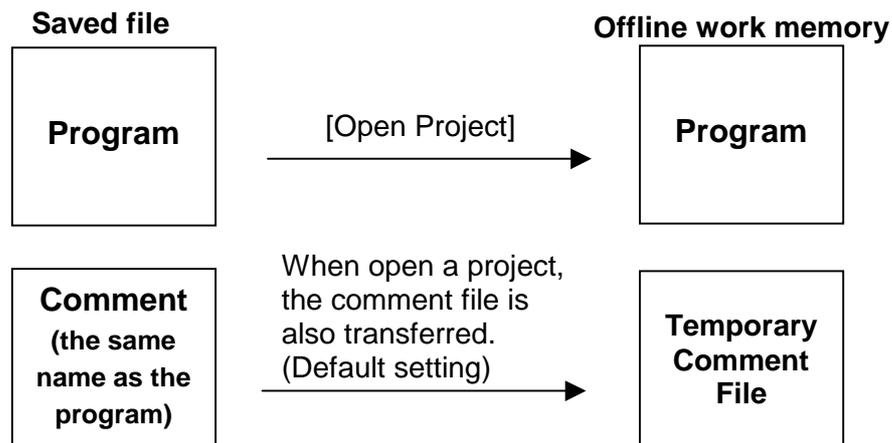
Offline: The T-PDS32 reads/writes program and data with the offline work memory on the PC.

The T-PDS32 reads/writes comments in the offline work memory (temporary comment file).

It is necessary to save them into a file before exit.

2. Relation between work memory and comment file

When a project is opened, the T-PDS32 reads the program and data from the file and load them in the work memory as follows.



In the default setting, the comment file is also transferred to the work memory (temporary comment file) when [Open Project] is executed.

If you do not want to transfer the comments, uncheck comment in the transfer items. (See Section 2.5 on Page 30)

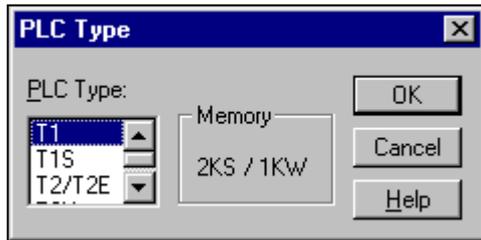
The temporary comment file is initialized when creating a New Project.

When you load comments into the temporary comment file from another comment file, use [Append] function under [Comment] menu.

2. Starting Up the T-PDS32

2.4 Opening a New Project

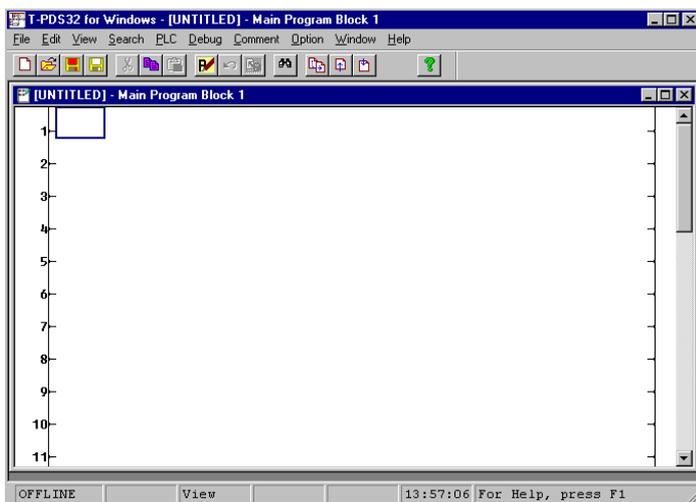
To create a new program in Offline status, first you must open a new project. Click New Project on the File menu. (Toolbar is also available)



The PLC Type list box will appear asking you to select the PLC.

In the PLC Type list box, select the controller PLC type (T1, T1S, T2/T2E, T2N, T3, T3H-32K, T3H-64K, S2T-32K or S2T-64K).

The memory size and data register size for the selected type will appear.

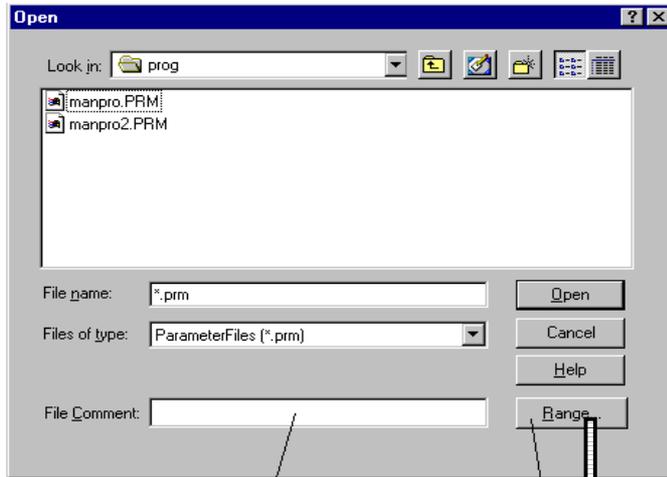


Click OK to create a new project for the selected controller type; the Program screen will appear. Click Cancel to cancel the creation process.

2. Starting Up the T-PDS32

2.5 Opening an Existing Project

To use an existing project, click Open Project on the File menu.
(Toolbar is also available)



A dialog box will appear, asking you to select the project.

(1) File Comment

Shows the title of the project at the location of the cursor in the File Name list box.

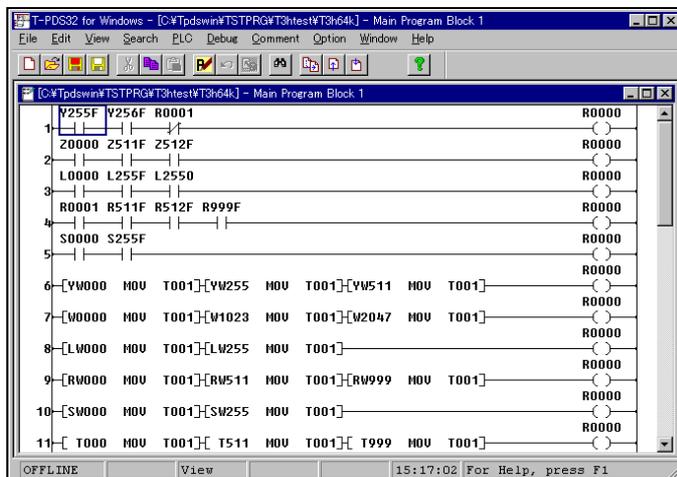
(2) Range

Displays dialog box used to select the type of files to be loaded.

To designate an existing project, select the file from the ones in the File Name list box, or enter the name of the file in the File Name text box.



Clicking Range shows the Target dialog that allows you to select either program files only or both program and data files .



Click OK in the Select Project box to open the designed project.

Click Cancel to cancel the open project process.

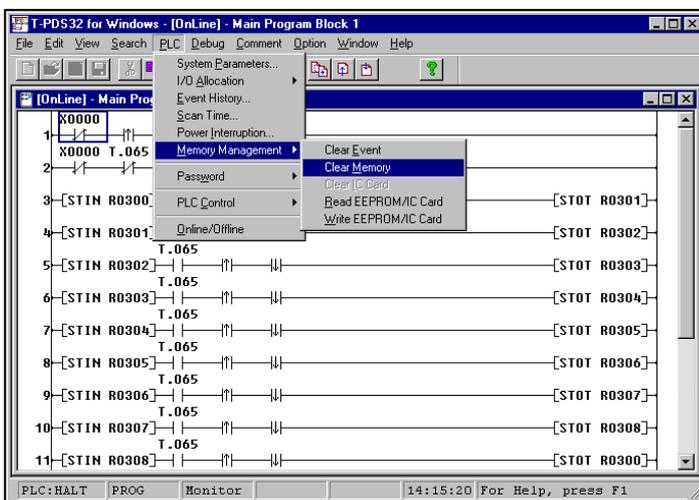
3. Programming

The first step in the programming process is to register the I/O card and the system parameters needed by the control system.

In this manual, programming steps are explained using online mode. Basically programming in offline mode is almost same as online mode.

3.1 Clear Memory

When you program initially, you should clear the controller memory using the Clear Memory command.



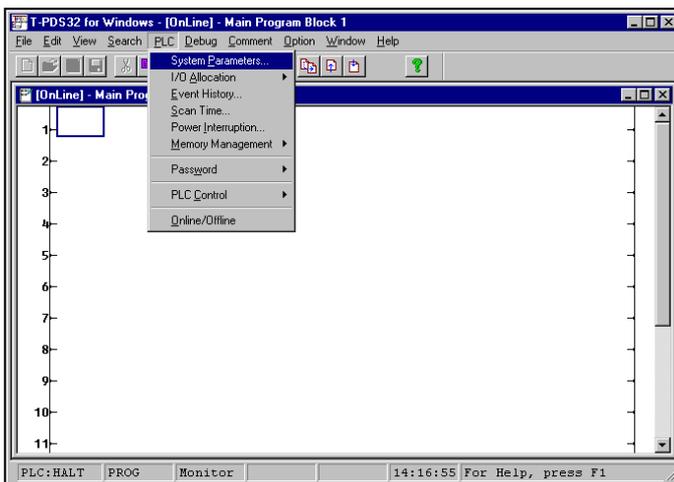
On the PLC menu, point to Memory Management and click Clear Memory. A dialog box will appear, asking you to confirm that you want to clear the memory. Click OK.

This will initialize system parameters, clear I/O registration, all program and register data. This command cannot be undone, so be sure you want to clear the memory before initiating the procedure. Back up necessary data to a disk.

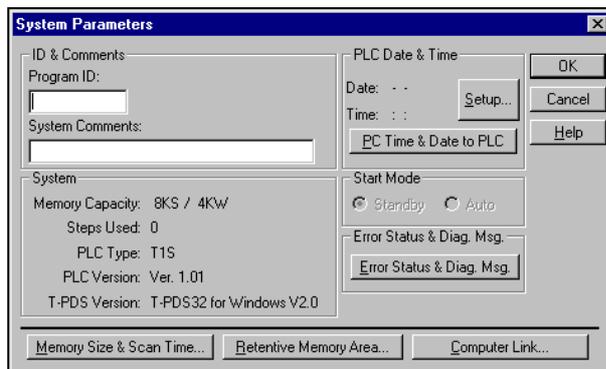
3. Programming

3.2 Registering System Parameters

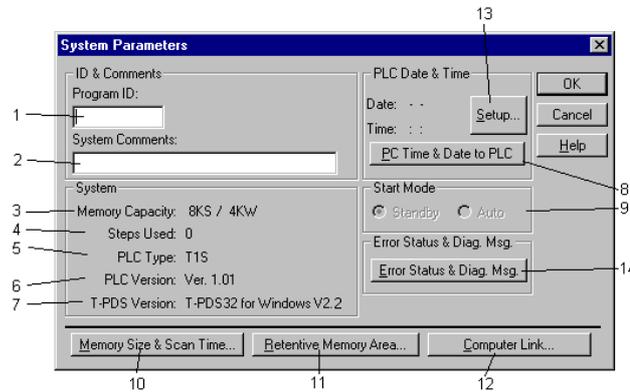
This section describes how to register the system parameters needed to control the flicker circuit.



Click System Parameters on the PLC menu. The System Parameters box will appear.



The System Parameters window will appear. On this window, connected PLC information, loaded program information and control parameters are displayed.

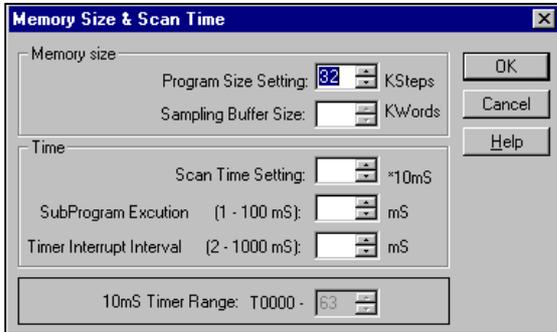


<System Parameters box>

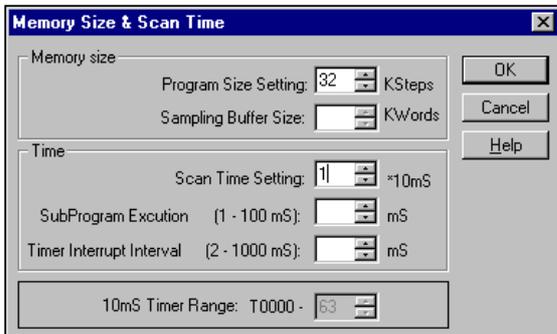
- 1 - Program ID: The name used to identify the user program (Up to 10 characters)
- 2 - System Comments: Comments added for the user program (Up to 30 characters)
- 3 - Memory Capacity: Shows the PLC's memory capacity (Program in K steps / Data registers in K words)
- 4 - Steps Used: Shows the number of steps used in the user program.
- 5 - PLC Type: Shows the PLC type. (online only)
- 6 - PLC Version: Shows the PLC version. (online only)
- 7 - T-PDS Version: Shows the version number of the T-PDS32.
- 8 - PLC Date & Time: Shows the date and time that is managed in the PLC. (online only)
 - PC Time & Date to PLC: Used to set the PC's date and time to the PLC. (online only)
- 9 - Start Mode: Selects the PLC's initial operation mode immediately after the power is turned on. (for T3H, S2T only)
 - Standby: Starts up in HALT mode regardless of the position of the operation mode switch on the CPU
 - Auto: Goes into RUN mode when the operation mode switch on the CPU is RUN or P-RUN
- 10 - Memory Size&Scan Time: Displays a dialog box used to set the program size, sampling buffer, scan time, subprogram execution time, timer interrupt interval and 10ms timer allocation.
- 11 - Retentive Memory Area: Displays a dialog box used to set the retentive register area.
- 12 - Computer Link: Displays a dialog box used to set the computer link transmission parameters.
- 13 - Setup (online only): Used to set the PLC's date and time.
- 14 - Error status/diagnostics: Displays a dialog box showing the error status and diagnostics. (online only)

3. Programming

In this example, you will set the scan time for the flicker circuit control program.



Click the Memory Size & Scan Time button to display the Memory Size & Scan Time box.



Move the cursor to the Scan Time Setting box. Enter a scan interval and click OK, which saves the value temporary. Then, return to the System Parameter box. Click the OK button in this dialog box to register and confirm the entered value as a system parameter.

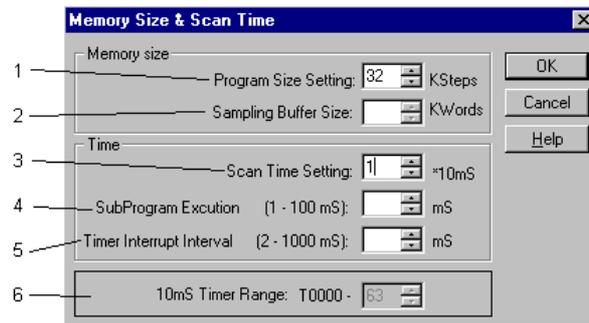


You will see a dialog box, asking you to confirm that you want to register the new data. To register the data for the controller, click OK. To cancel the registration process, click Cancel.

Additional Informtion

In the Event of a Registration Error (Mode Unmatch)

System data can only be registered when the controller is in HALT mode. If a registration error occurs, change the controller operation mode to HALT mode, either by using the operation mode switch on the controller or by using Control command of T-PDS32.



<Memory Size & Scan Time box>

- 1 - Program Size Setting: Sets the size of memory reserved for the program. This item is available for T1S to select memory mode 4K or 8K, and for T3/T3H/S2T to reserve comment memory in the PLC.
- 2 - Sampling Buffer Size: Sets the buffer memory size for the sampling trace function. The setting range is shown below.

PLC type	Minimum	Maximum	Note
T1,T1S	1KW	1KW	Fixed at 1KW
T2/T2E,T2N	8KW	8KW	Fixed at 8KW
T3, T3H	0KW	8KW	
S2T	8KW	8KW	Fixed at 8KW

- 3 - Scan Time Setting: Sets the constant scan interval for main program. The setting range is 10 to 200ms. The value is set in 10ms increments, so enter a value from 1 to 20.
- 4 - Sub Program Execution: Sets the execution time limit for sub-program. The range for this setting is shown below.

PLC type	Minimum	Maximum	Note
T1,T1S	0ms	0ms	Not supported
T2/T2E,T2N	0ms	0ms	Not supported
T3, T3H, S2T	1ms	100ms	

- 5 - Timer Interrupt Interval: Sets the interrupt interval for the timer interrupt program. The setting range is shown below:

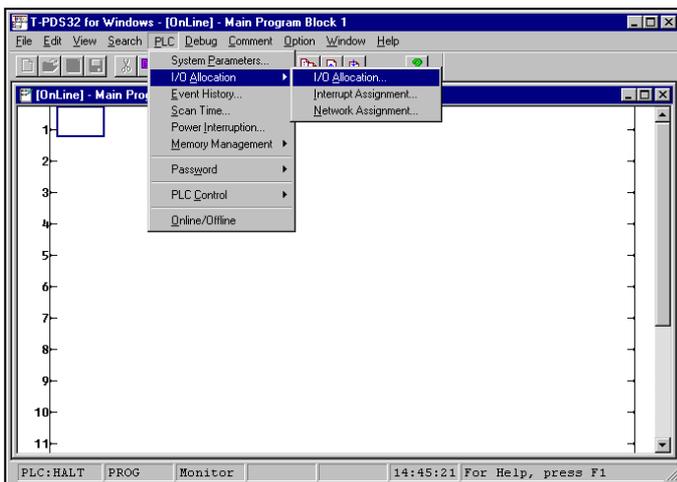
PLC type	Minimum	Maximum	Note
T1, T1S, T2/T2E,T2N	5ms	1000ms	5ms increments
T3	2ms	1000ms	1ms increments
T3H, S2T	1ms	1000ms	1ms increments

- 6 - 10ms Timer Range: Sets the 10ms timer allocation range. The default setting is T000 to T063. Other than this range of timers works as 100ms timer. (T3H, S2T only)

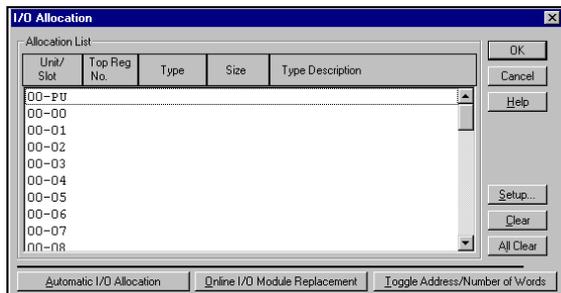
3. Programming

3.3 Registering I/O Cards

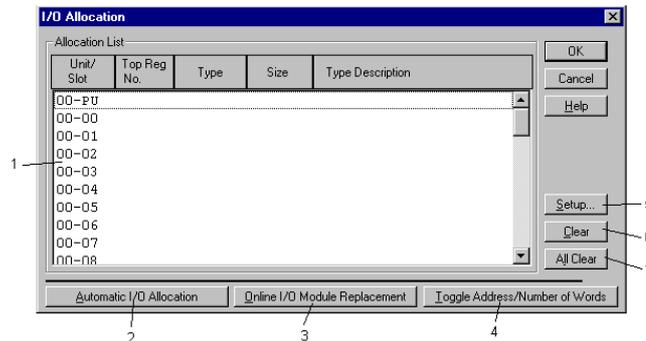
This section describes how to register the system parameters needed to control the flicker circuit.



On the PLC menu, point to I/O Allocation and click I/O Allocation on the submenu.



The I/O allocation box will appear.



<I/O Allocation box>

1 - Allocation List:

Shows the I/O allocation status.

- Unit/Slot:

Shows the unit and slot numbers separated by a hyphen (unit - slot). Unit 0 means the main unit, Unit 1 means the expansion unit 1, and so on. The available setting ranges of the unit - slot and the maximum number of I/O modules are shown below.

PLC type	Unit - slot	I/O modules	Note
T1,T1-40S	0 - 0 to 0 - 7	2 option card + 4 I/O module	Main unit is allocated on unit 0 - slot 0
T1-16S	0 - 0 and 1 - 0 to 1-7	8	Main unit is allocated on unit 0 - slot 0 I/O modules are allocated on the unit 1
T2/T2E, T2N	0-3	32	
S2T	0-3	32	
T3	0-3	43	
T3H	0-6	76	

- Top register no:

When the unit base address setting function is used, the setting address is displayed.

- Type: The I/O type is displayed.

- Size: The shared I/O register size is displayed.

- Type Description:

Shows the I/O module name. (available at setting)

2 - Automatic I/O Allocation:

Used to automatically register the I/O card when the I/O card is installed. (online only)

3 - Online I/O Module Replacement:

Used to disconnect a designated I/O card in software to enable online I/O replacement.

To use this function, locate the cursor on the slot to be disconnected, then click the Online I/O Module Replacement button. When disconnected, ampersand (&) mark will appear on the slot. During this status, the I/O module can be replaced.

To recover to normal operation, point the slot and click again the Online I/O Module Replacement button.

4 - Toggle Address/Number:

Used to check the leading register address assigned to the I/O card.

5 - Setup: Used to set the I/O allocation. Point the slot, then click the Setup button.

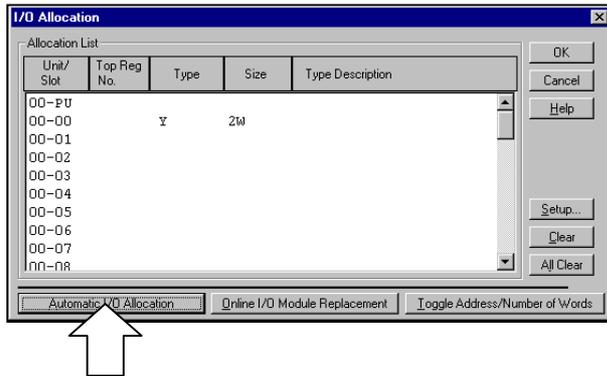
6 - Clear: Clears the I/O allocation data for the slot where the cursor is positioned.

7 - All Clear: Clears all I/O allocation data.

3. Programming

3.3.1 When I/O Cards are Installed

When an I/O card is installed in the controller slot, the Automatic I/O Allocation function can be used to have the installed I/O card automatically registered.

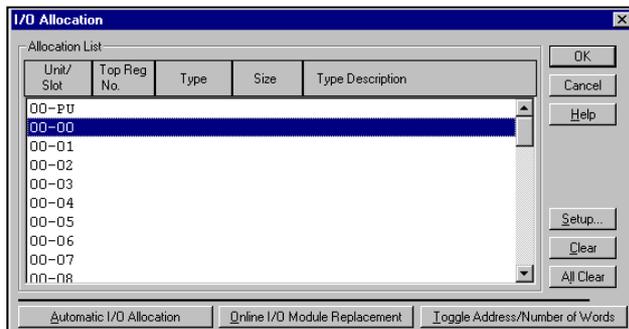


Click the Automatic I/O Allocation button. The programmer will check the type of card installed in the slot and display it on the screen. Check to make sure that "Y 2W" is displayed for slot 0.

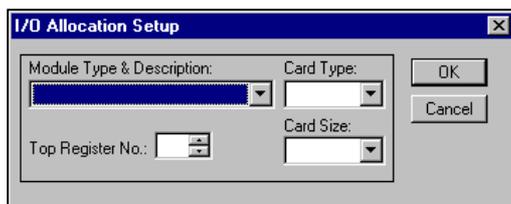
The card type "Y" indicates an output card, used for flicker circuit lamp output. The card size "2W" indicates that the card handles 32 output points.

3.3.2 When No I/O Card is Installed

When no I/O card is installed, the I/O card data must be set manually. The following example describes how to set data by registering a 32 output points module in slot 0 of the base unit.

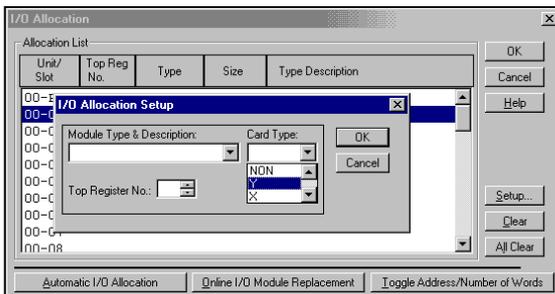


Designate the slot position and click Setup.

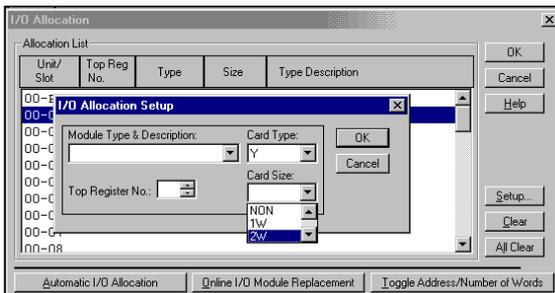


The I/O Allocation Setup box will appear.

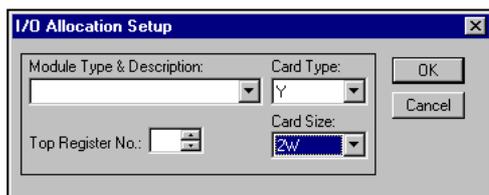
3. Programming



Move the cursor to the Card Type area. Select the card type from those displayed in the list box. For this example, select "Y."

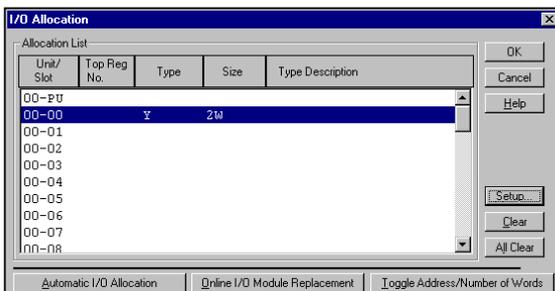


Next, move the cursor to the Card Size area. Select the card size from those displayed in the list box. For this example, select "2W." Click OK. The I/O Allocation box will become the active window again. When this happens, the data will be displayed at the location of the corresponding slot.



To write the setting, click OK.

To cancel the setting process, click Cancel.



To set the I/O allocation for a different slot, repeat the same procedure for each slot in the I/O Allocation box.

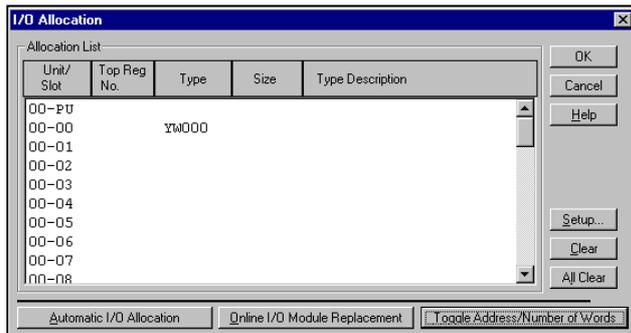
Additional Information

Even if you click OK in the I/O Allocation Setup box, the settings are not registered until you click OK in the I/O Allocation box.

3. Programming

3.3.3 Checking Register Numbers

When I/O card registration is complete, you should check the register address for the card.



Click Toggle Addresses/Number of Words. The data for slot 2 will change from card type/size "Y 2W" to "YW000". Clicking the button again causes the card type/size data to reappear.

This shows that the card registered in this example has been allocated to two word of the YW000 output register. Designating device number Y000 - Y01F for the flicker circuit lamp output in the program causes the data to be output to this card.

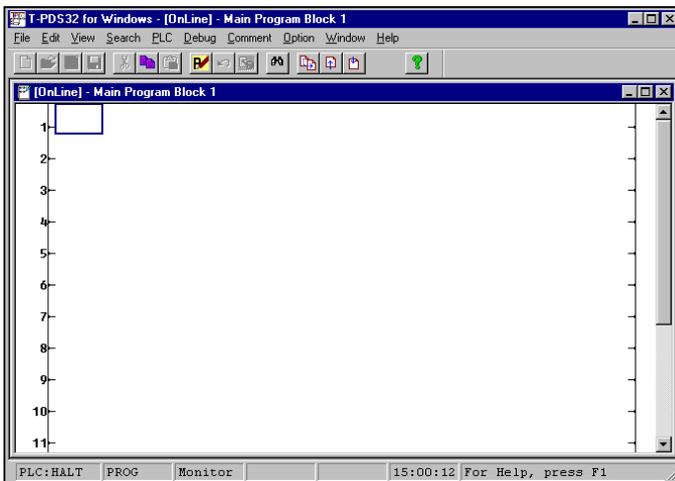
3. Programming

3.4 Programming

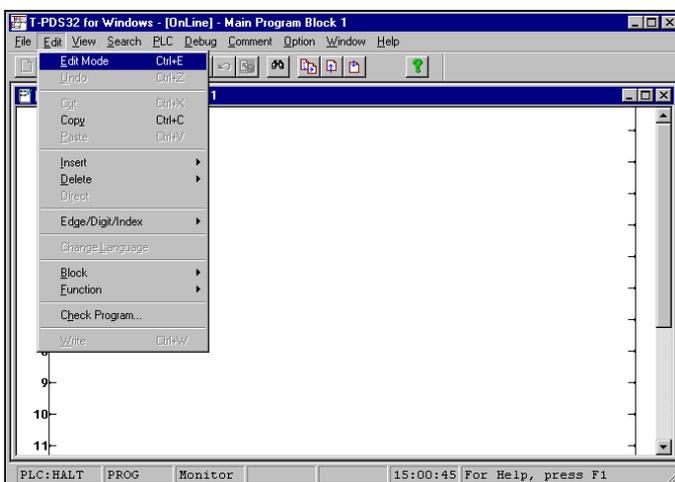
Now you can create the program for the flicker circuit. Programming is done in Edit mode.

3.4.1 Programming screen

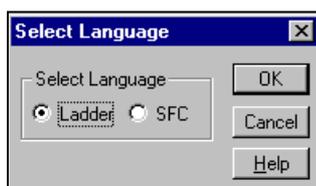
Open the Programming screen. This prepares a blank screen for creating the program.



When the operation status is changed to Online, a Programming screen with a bus for the ladder program will appear. If a program already exists in the controller, the program is displayed.

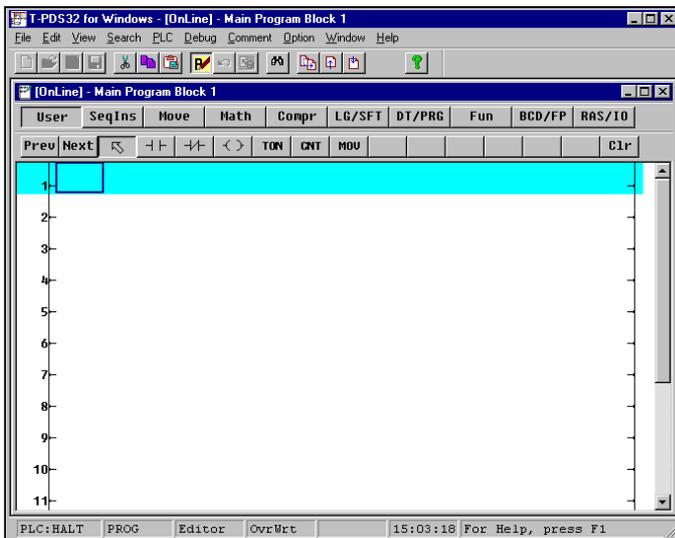


Programming is done in Edit mode. On the Edit menu, click Edit Mode. (Toolbar is also available)



A dialog box will appear, allowing you to select the programming language. Select Ladder and then click OK.

3. Programming



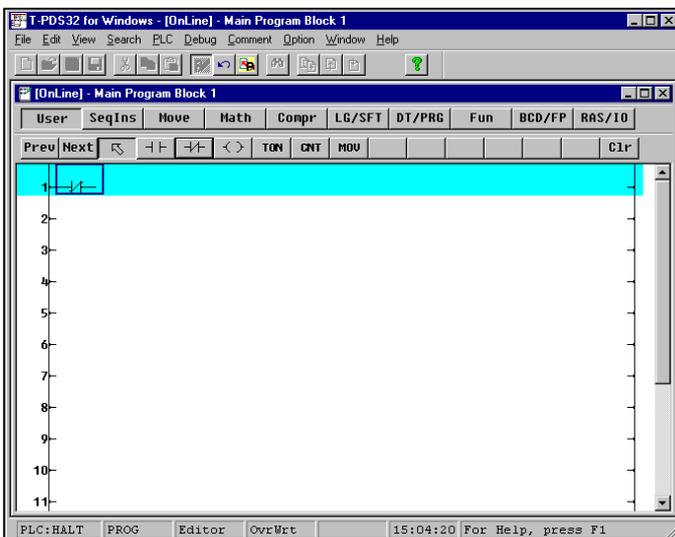
The programming window will change to editable status and the circuit at the position of the box cursor will be shaded. A toolbar containing instruction will also appear.

Editing can be done for the circuit at the current location of the cursor. You may also use the Shift + ↓ keys to designate the range for editing. Up to 11 lines may be designated in this manner.

Editing may be done in only one programming window per project. Online traces cannot be displayed in the programming window being edited.

3.4.2 Creating Circuit 1

Now you are ready to create the first circuit for the flicker circuit.



To make a circuit, pick-up an instruction by mouse click, place it on the position in the edit area by mouse click, then enter the operand (register, device, or constant value).

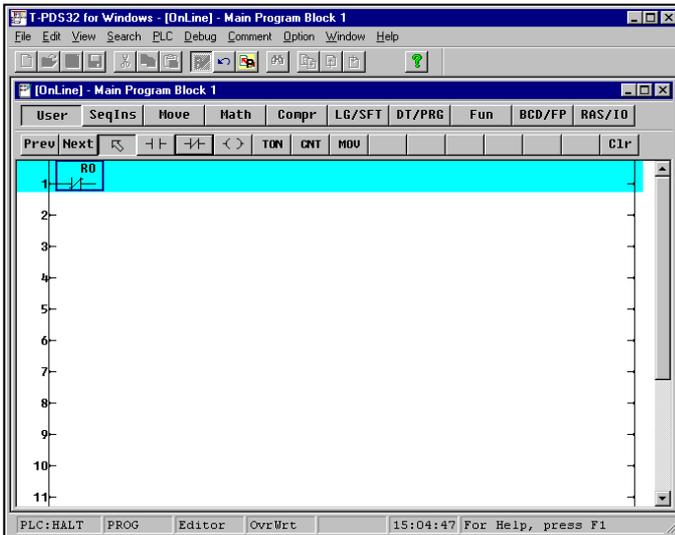
In this example you will first place a NC contact of R000.

In the Ladder Instruction toolbar, pick-up NC contact and place it on the left end of circuit 1. This will place a NC contact at that location.

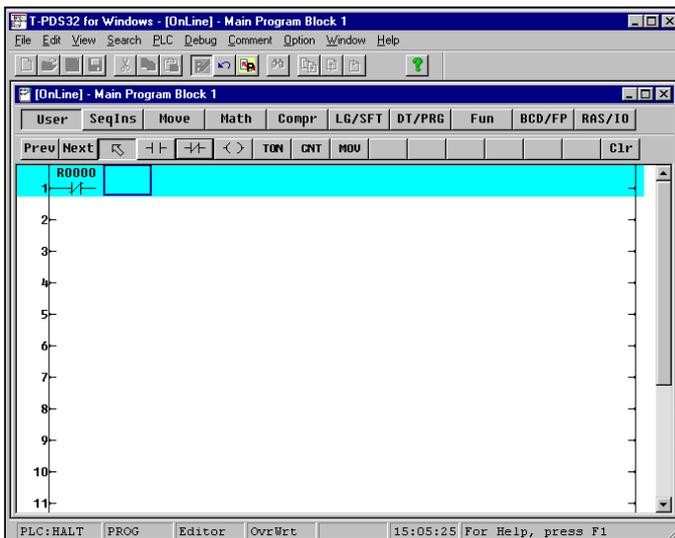
Additional Information

To continuously place the same instruction, select an instruction and click the left mouse button while pressing the Shift key.

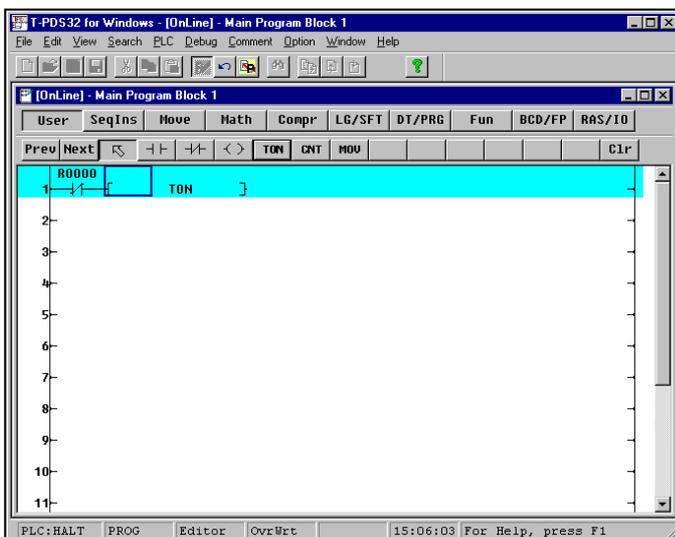
3. Programming



Operands may be entered when the box cursor is at the location of the symbol. Enter "R0" on the keyboard. When "R0" appears above the NC contact, press the Enter key.

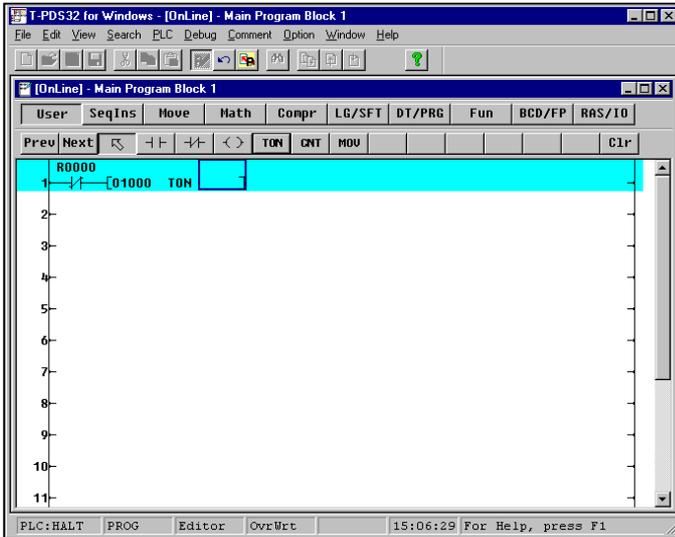


When you enter operands, you may omit the zeroes after the register number and device number codes. For example, to enter "R0001F," you can enter "R1F". Also, even if you enter small letters such as "r" in operands, these will be converted to capital letters when Enter key is pressed.

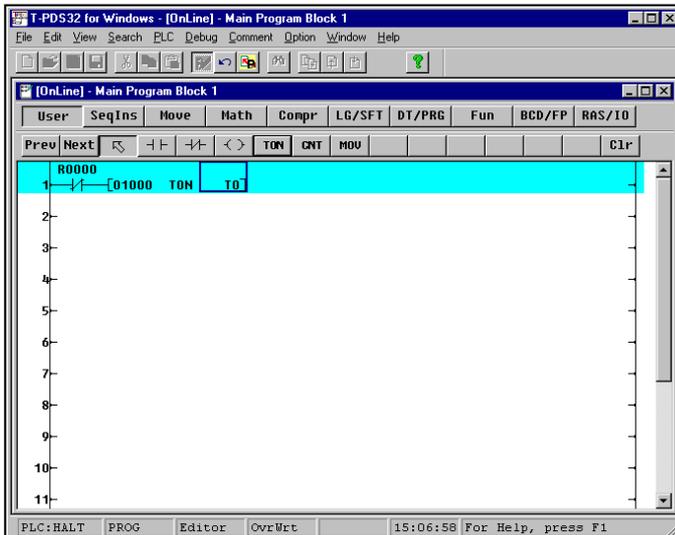


Next you will place an ON delay timer connected to the NC contact. Select "TON" instruction and then move the mouse pointer to the right of the NC contact and click the button. The symbol for the ON-delay timer will appear.

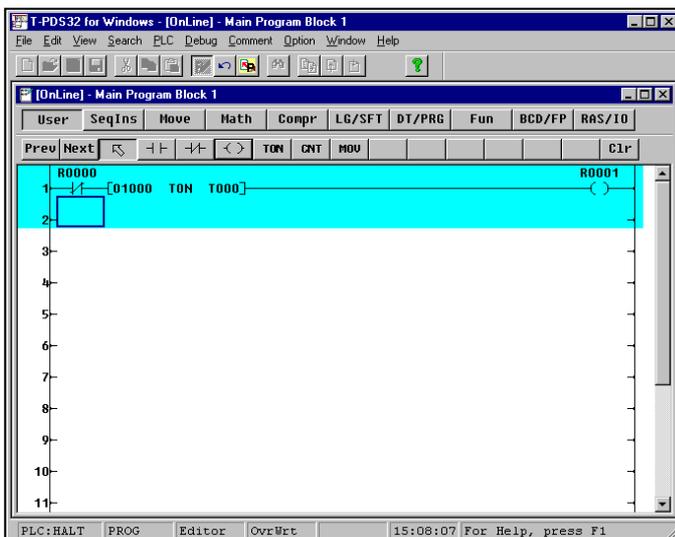
3. Programming



Two operands are needed for the ON-delay timer: the preset time and the timer number. Check that the box cursor is at the preset time position then enter the preset time setting by the keyboard. Preset time is entered in 10ms increments for T0 to T63 and in 100ms increments for T64 and after. The startup time setting for this flicker circuit is 10 seconds. Enter "1000."



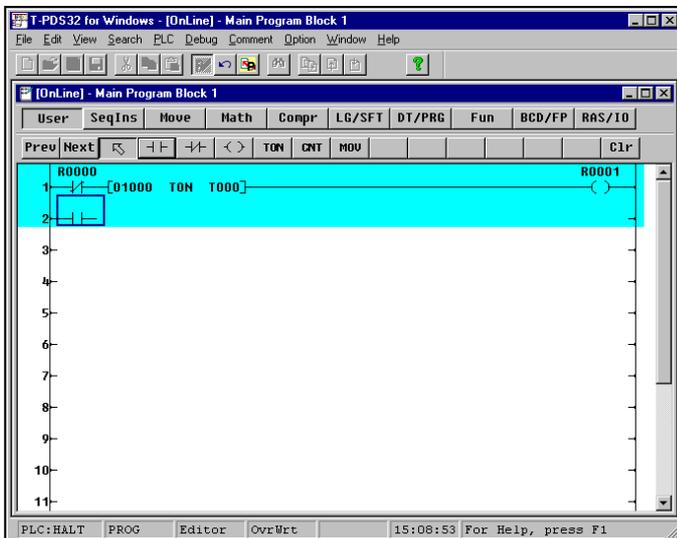
When the Enter key is pressed, the cursor will move to the timer number position. Then enter the timer number. In this sample, timer 0 is used. So enter "T0". When the Enter key is pressed, "T000" will appear and the cursor will move to the right of the ON-delay timer symbol.



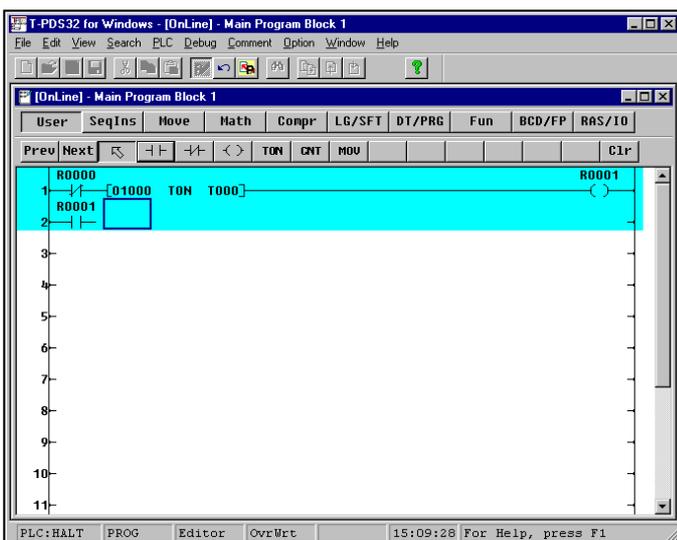
Select the symbol for output coil, then point the right of the ON-delay timer and click the mouse. The output coil will be placed at the right end of circuit 1. The connection line is automatically drawn between the ON-delay timer and the coil. Check that the cursor is at the output coil position and enter "R1" by the keyboard. When the Enter key is pressed, "R0001" will appear above the coil.

3. Programming

3.4.3 Creating Circuit 2

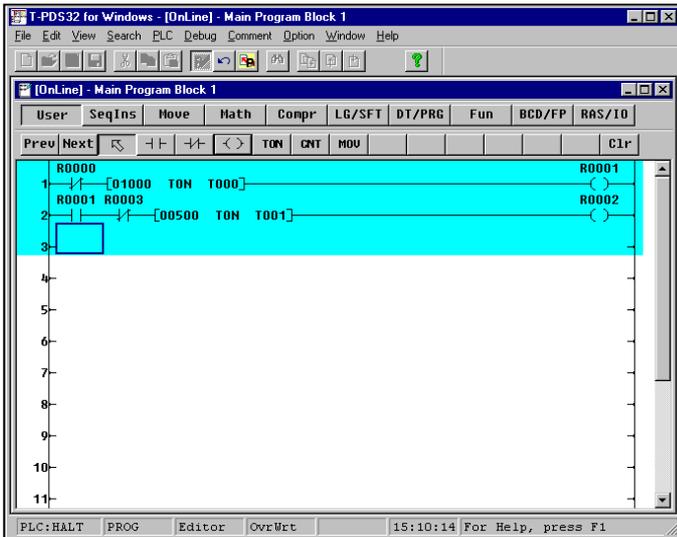


Place an NO contact of R0001.
In the Ladder Instruction toolbar, select NO contact and move the mouse pointer to the left end of circuit 2 and click the left mouse button.
This will place an NO contact at that location.



After you placed the NO contact, enter the operand.
Enter "R1" on the keyboard. When "R1" appears above the NO contact, press the Enter key.

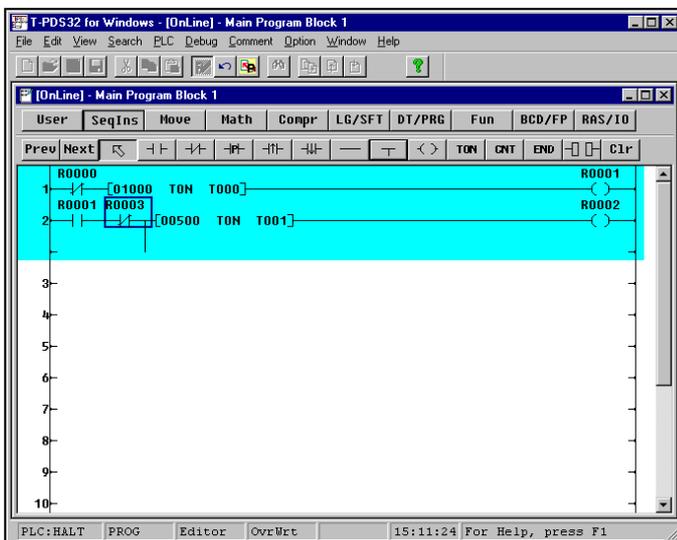
3. Programming



As same manner, place an NC contact of R0003, an ON delay timer (preset time 5 sec, timer 1) and an output coil of R0002.

<Summary>

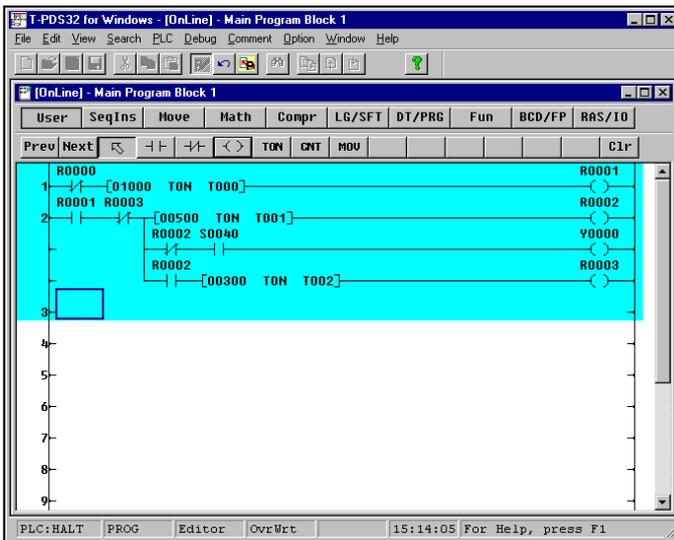
Select NO contact	Click left button	Enter R1	Press [Enter]
Select B contact	Click left button	Enter R3	Press [Enter]
Select TON	Click left button	Enter 500	Press [Enter]
		Enter T1	Press [Enter]
Select coil	Click left button	Enter R2	Press [Enter]



Next, a vertical connection must be placed on the output side of the NC contact of R0003 for branching. The vertical line is in the SeqIns (sequence instruction) group. Select the SeqIns and click the vertical line. Then place it on the NC contact of R0003. The vertical line is drawn from right hand to downward. In this manner, a vertical circuit will be created to the right below the position of the cursor.

To clear the vertical line, select the vertical line and place on the position to be cleared. Then the vertical line will be cleared.

3. Programming



Now you will create the second and third lines of the circuit.

Move the cursor to the second line of the circuit and move it to the right of the vertical connection and place a symbol there. Then click the operand item.

To place a vertical connection on the third line of the circuit, move the cursor to the vertical connection on the second line, then select the vertical connection item and click the left button. A one-line vertical connection will be placed there.

<Summary>

Move cursor to third line of Circuit 2 (to right of vertical connection)

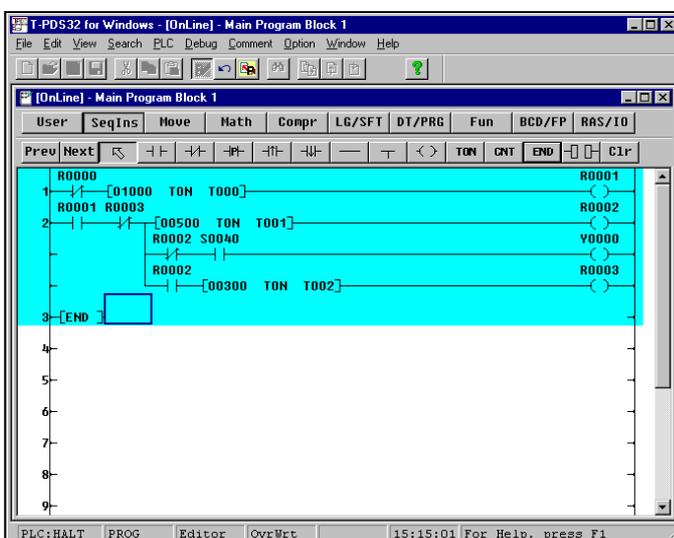
Select NC contact	Click left button	Enter R2	Press [Enter]
Select NO contact	Click left button	Enter S40	Press [Enter]
Select coil	Click left button	Enter Y0	Press [Enter]

Move cursor to vertical connection on second line of Circuit 2

Select NO contact	Click left button	Enter R2	Press [Enter]
Select TON	Click left button	Enter 300	Press [Enter]
		Enter T2	Press [Enter]
Select coil	Click left button	Enter R3	Press [Enter]

3.4.4 Finishing the Program

An END instruction is always required at the end of the program.



Move the box cursor to the top of Circuit 3, then select END on the toolbar and click the left button. The END instruction symbol will appear in Circuit 3.

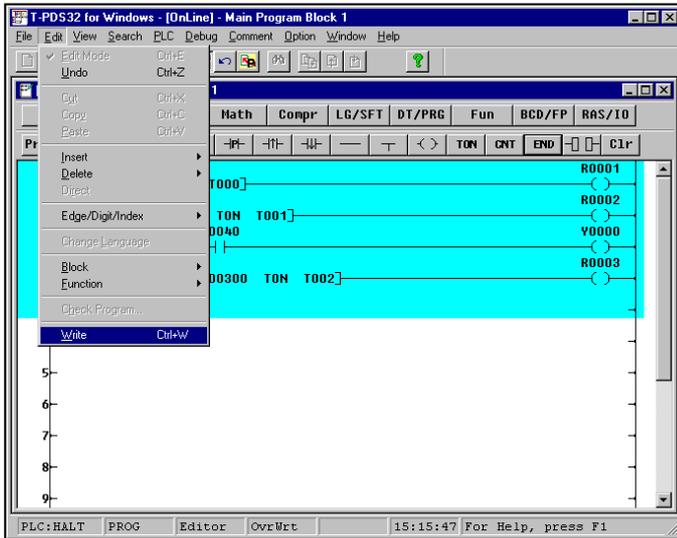
At this point, the END instruction symbol is not connected to the right bus.

However, when the program is written, the END instruction will be automatically connected to the right bus, so there is no need to do this manually.

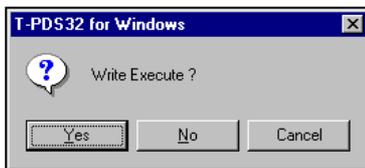
3. Programming

3.4.5 Writing the Program

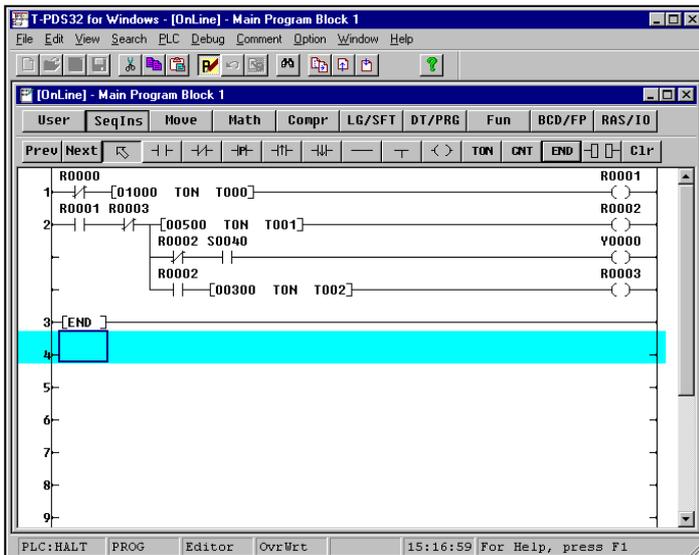
Now you will write the program that you have created to the controller.



On the Edit menu, click Write.
(Toolbar is also available)



A message will appear, asking you to confirm that you want to execute the write command. Click Yes. The program will be written to the controller.



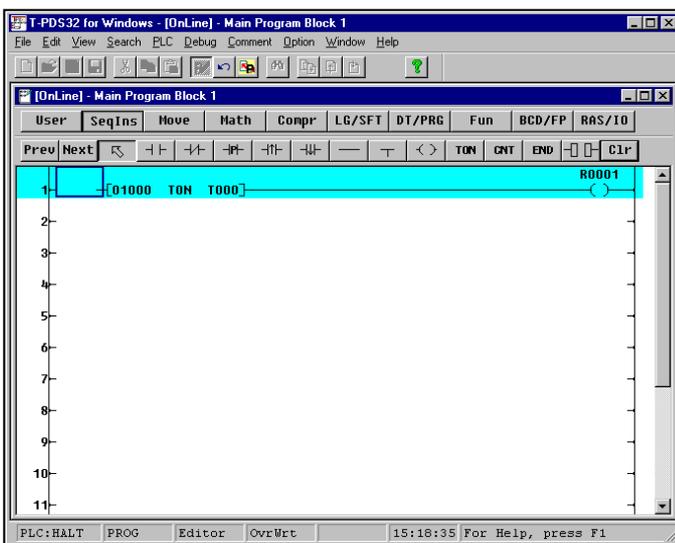
When the write process is complete, click Edit Mode on the Edit menu.
The T-PDS32 will quit edit mode and the Program screen will reappear.

Pressing the Ctrl + E keys can also quit edit mode.

3.4.6 Correcting the Instruction

Clear the Instruction Symbol

If you have made a mistake in the symbol placement process, click **Clr** in the Ladder Instruction toolbar to delete the mistake. For this example you will delete the first symbol that you placed, the NC contact of R000.

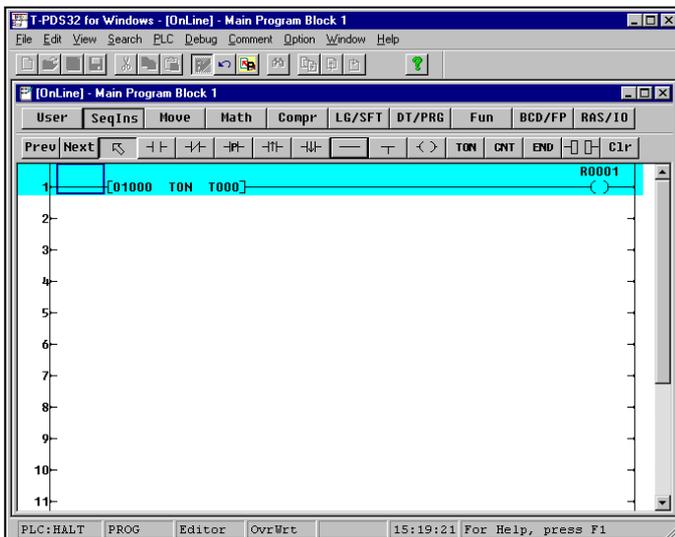


Click **Clr** in the Ladder Instruction toolbar and then move the mouse pointer to the NC contact and click the mouse button. The symbol and operand will be deleted.

[Del] (Delete) key on the keyboard can also be used to clear the instruction.

You may also use the space key on the keyboard to delete an operand that has been entered by mistake.

When a symbol has been cleared, a blank space will remain at the cleared location. Leaving this as it is will result in an incomplete connection, so you should connect the circuit through this area.



In the toolbar, select the symbol for horizontal short and then move the mouse pointer to the blank area and click the mouse button.

To delete the ON-delay timer, click **Clr** and move the mouse pointer to the TON position at the ON-delay timer and click the mouse.

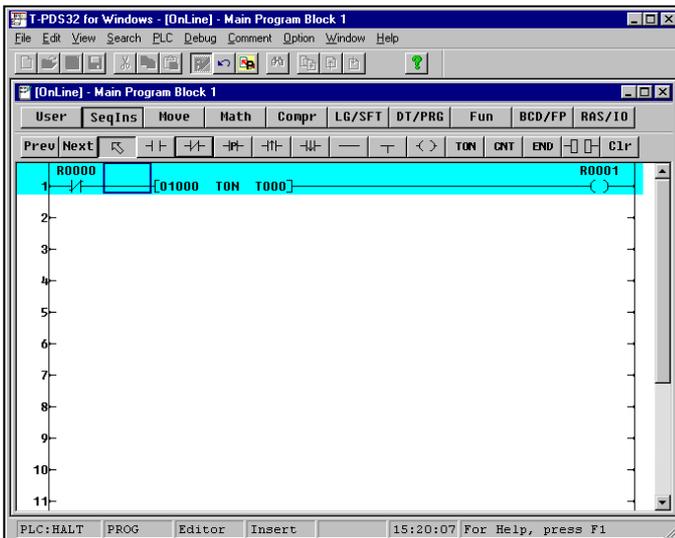
You may also use the space key on the keyboard to delete an operand that has been entered by mistake.

Move the cursor to the operand position and press the space key. Only the operand will be deleted, so enter the operand again.

3. Programming

Overwrite/Insert

Two modes are available for placing symbols in the circuit: Overwrite mode and Insert mode. Pressing the Ins key on the keyboard toggles the mode to Overwrite (and the indicator in the status bar at the bottom of the screen changes to "OvrWrt").



In Overwrite mode, entering a symbol replaces the data at the position of the mouse pointer.

In Insert mode, the symbol is inserted at the position of the mouse pointer.

In this example, you will use this function to place the B contact symbol again (the one that you cleared in the previous example).

Change the mode to Insert, then select B contact in the Ladder Instruction toolbar. Place the mouse pointer to the left end of circuit 1 and click the mouse button. One B contact will be inserted at the position of the cursor. After inserting the B contact, enter the operand again.

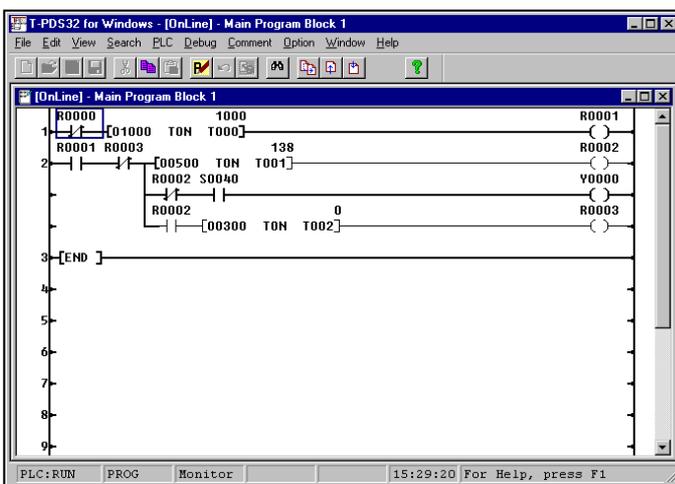
4. Program Execution

4. Program Execution

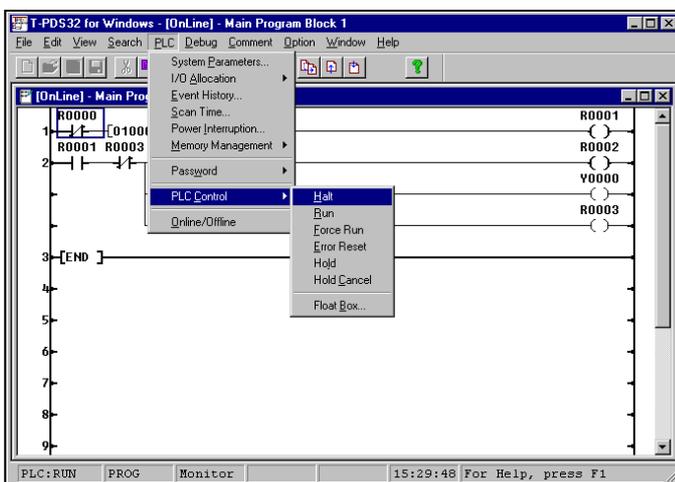
In this procedure, you will execute a program and check its operation. The execution status can be checked in the program as well as using the Data Monitor command on the View menu.

4.1 Executing the Program

First you will execute the program.

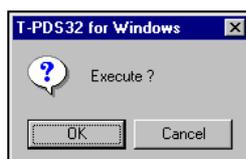


Programs can be executed using the operation mode switch on the controller. Execution can also be started and stopped with the programmer. Setting the operation mode switch on the controller to RUN will execute the program. Check to make sure that "PLC:RUN" is displayed for the operation status in the lower left-hand corner of the window. If an I/O card is installed, the bit 0 in the operation status LED will blink. Check to make sure it blinks in line with the program.



With the I/O card setting for the program created in this example, an error will result if the program is executed with no I/O card installed. If no I/O card is installed, use the procedure described in "Registering I/O Cards" earlier in this manual to change the setting to "no I/O card registered."

You can also operate the controller from the programmer. On the PLC menu, point to PLC Control. A submenu listing the operation modes will appear; select Halt and then click the mouse button or press the Enter key. (Toolbar is also available)

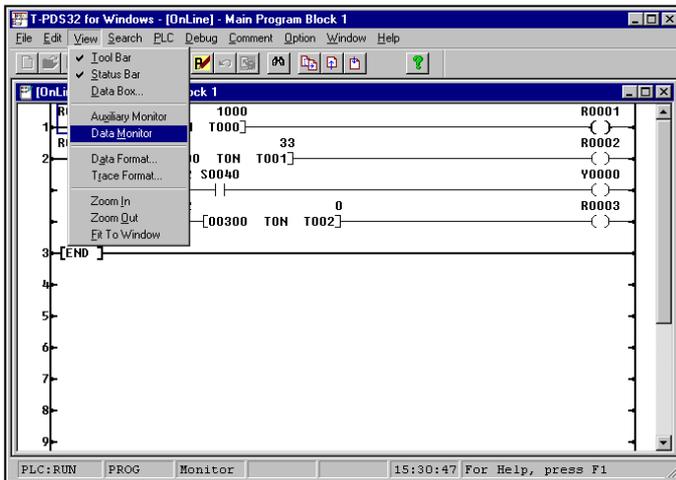


A message will appear, asking you to confirm that you want to execute that command. Click OK. The operation status in the screen will change to "PLC:Halt" and the controller will stop operating.

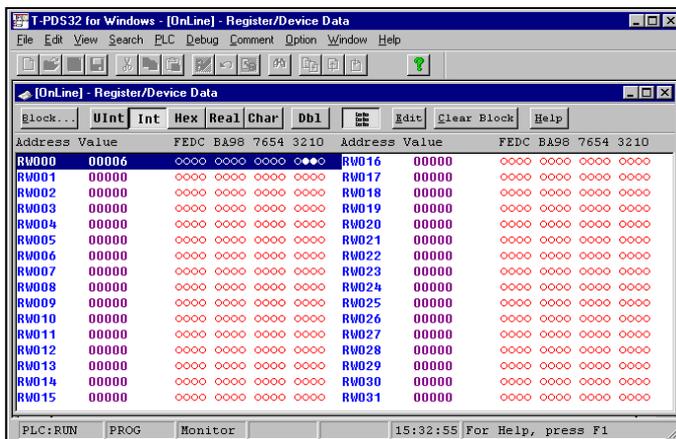
4. Program Execution

4.2 Checking Operation

Program operation can also be checked using the Data Monitor command on the View menu.

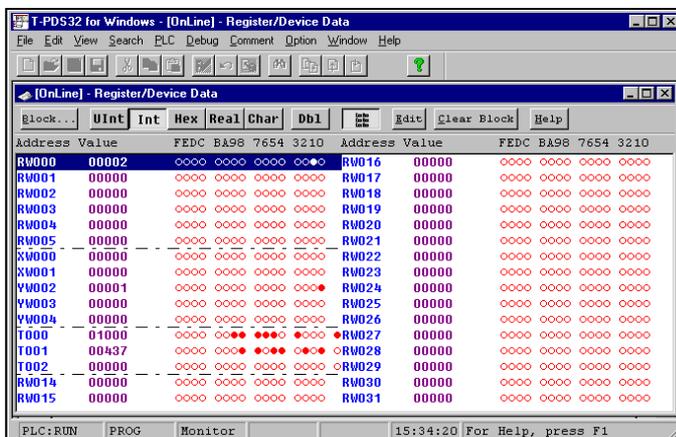


On the View menu, click Data Monitor. (Toolbar is also available)
A list will appear showing the current register values and the on/off status of each register bit.



The column on the left marked "Address" shows the registers (such as RW000) registered to the controller. The circles to the right correspond to the bits (0 - F) for these registers. A black circle indicates that the bit is on; a white circle indicates that the bit is off.

In addition to the displayed internal auxiliary registers, the Data Monitor command can also be used to display and check I/O registers and timer data. Current values can also be set and changed.



This figure shows the I/O registers and timer registers displayed in a single screen.

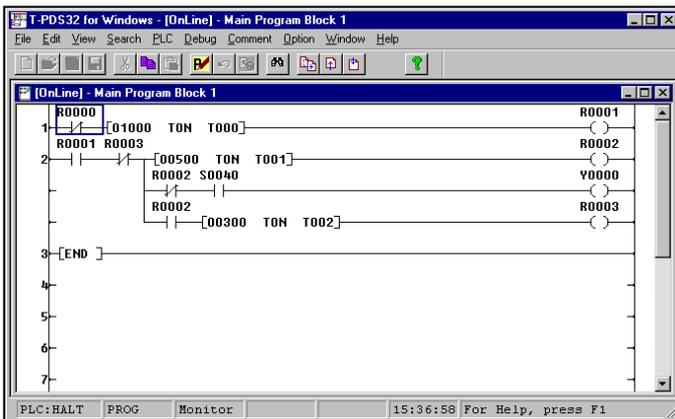
For more information on the data and register settings shown, see the Online HELP.

Check to make sure that the bit 0 in the YW000 register blinks in line with the progress of the program.

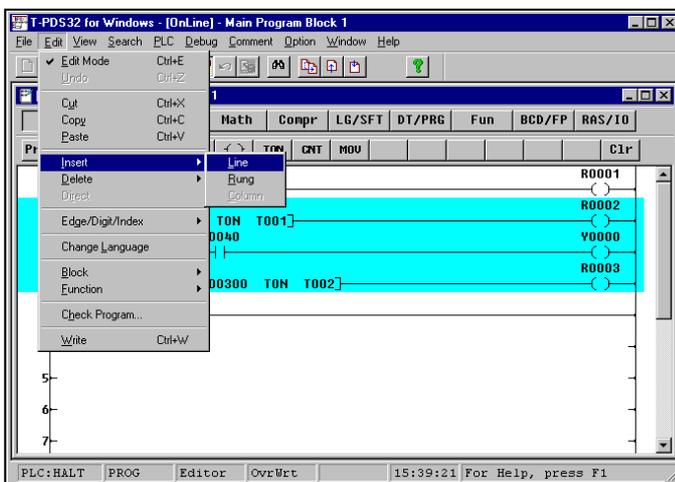
5. Advanced Editing

5.1 Inserting Circuits

In this section, you make a few edits and corrections to the circuit to add some features. You will begin by inserting a circuit.



In this example, first assume a flicker circuit for which the lighting interval has been set to 3 seconds by writing an ON delay timer directly. Then you will change this circuit to such a configuration that the data for the lighting interval for the circuit is set to the data register in advance and the ON delay timer references the value in this data register.

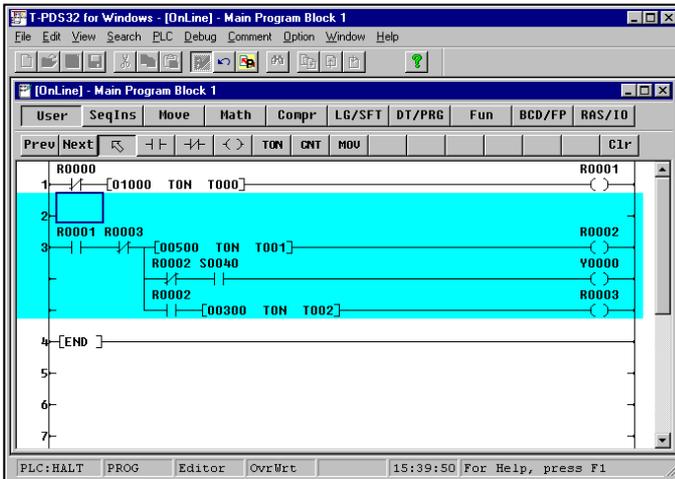


First, add a circuit in front of Circuit 2. To add a circuit, use the Line insertion function.

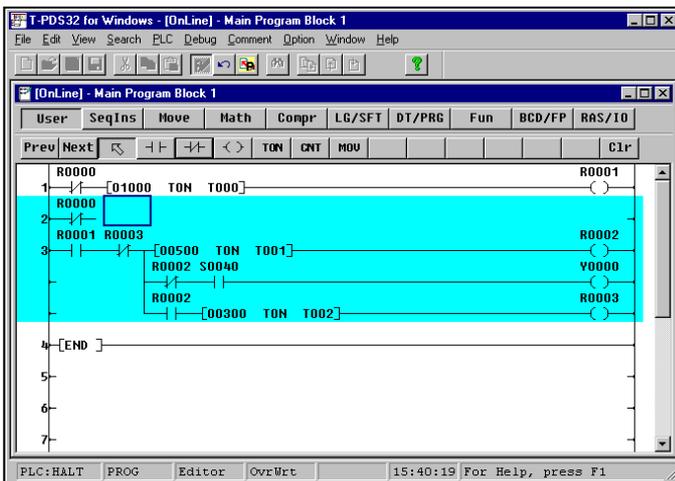
On the Edit menu, click Edit Mode.

In Edit mode, move the box cursor to the insertion point. Then, on the Edit menu, point to Insert and then click Line on the submenu.

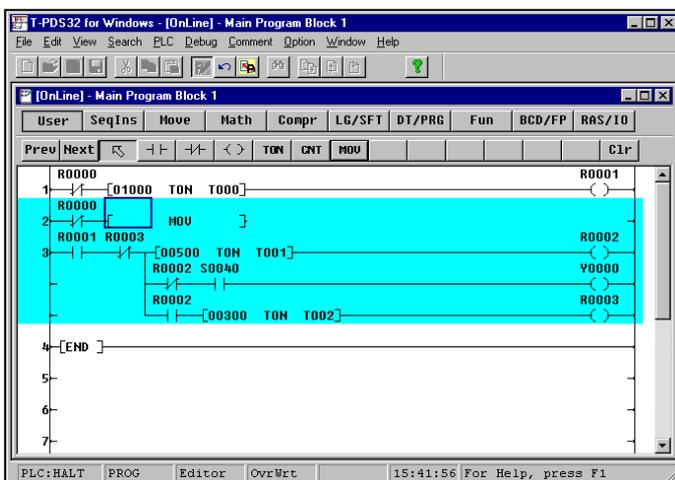
5. Advanced Editing



A blank line will be inserted. The existing circuits will move down from the next line on, as shown in the figure.

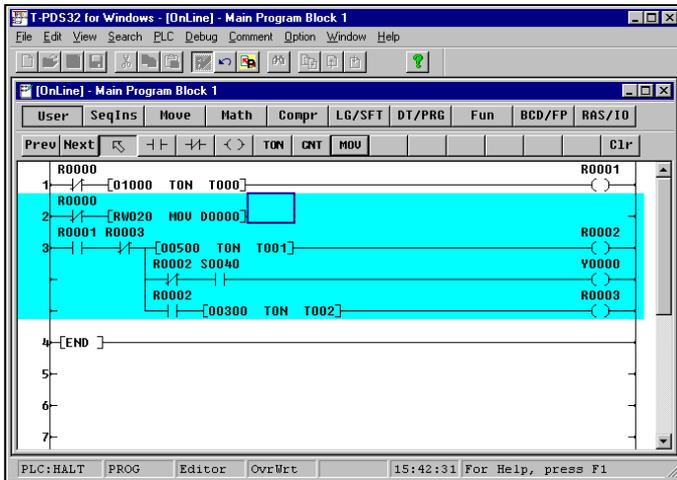


You will create a circuit on this line to set the lighting interval. Check to make sure that the box cursor is at the beginning of Circuit 2, then start by placing a NC contact of R0000.



When you have placed the NC contact, place the symbol for setting data to the data register. Select the "Mov" item and then click to the right of the B contact. The Mov instruction symbol will be placed there.

5. Advanced Editing

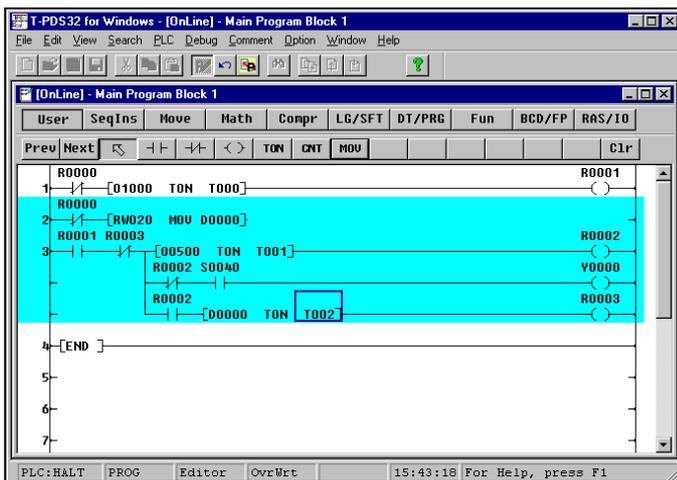


Two operands are entered for the Mov instruction symbol, a transfer source register or a constant and a transfer destination register.

In this example, we will assume that the data for the flicker circuit lighting interval is determined in another program (for example, to match the level of error occurrence) and stored in RW020, and we will transfer this data to data register D0000.

Enter the two operands on the keyboard.

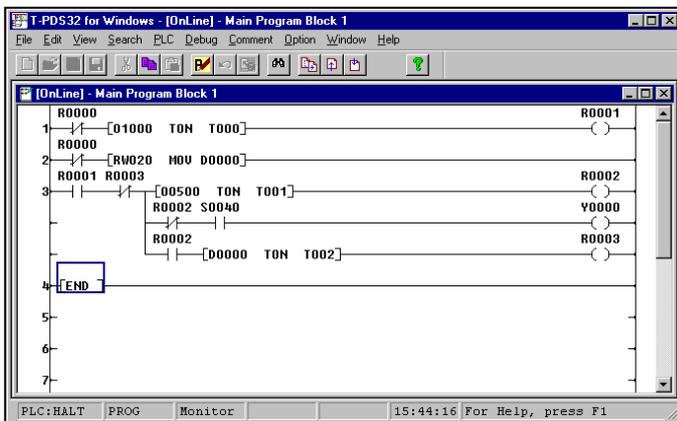
The line from the Mov instruction symbol to the right bus is unconnected, but it will be automatically connected when the program is written like the END instruction issued.



Now you will do a little editing on circuit 3. In this example, you will change the setting for the ON delay timer from a constant to the data register number. Move the box cursor to the first operand in the ON delay timer instruction in the third line of Circuit 3, then enter "D0" and press the Enter key.

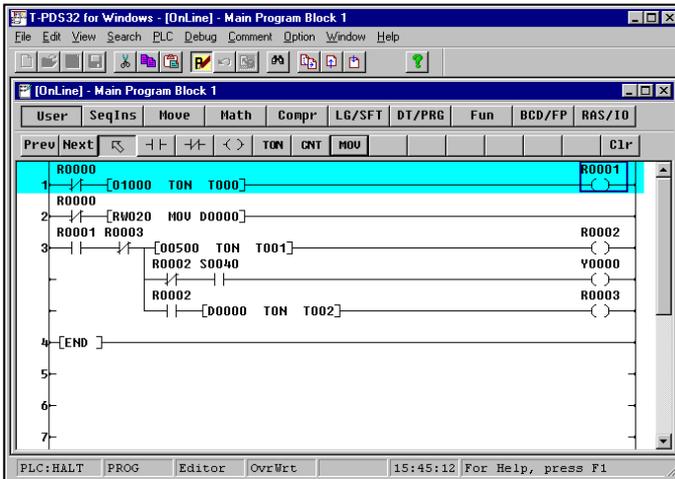
This will cause the ON delay timer setting to be replaced with the value in data register D0000.

When the operand has been properly entered, select Write to write the data to the controller.



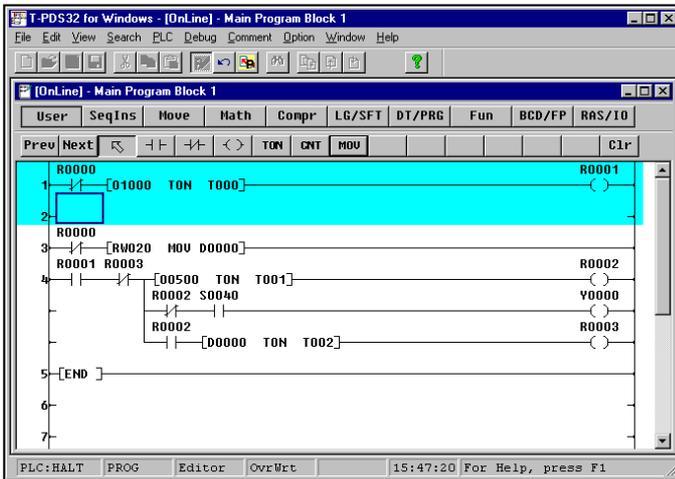
Check to make sure that the new circuit has been added to Circuit 2 and the subsequent circuits have moved down accordingly. Then quit Edit mode and return to Monitor mode.

5. Advanced Editing



Circuits may be inserted by using the Insert function. This may also be done by pressing the Enter key with the box cursor at the extreme right margin to insert a new line.

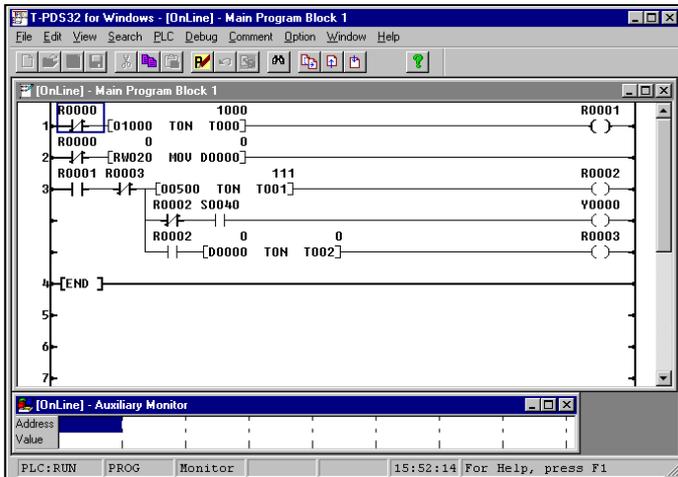
Change to Edit mode and move the box cursor to the last position in the first line.



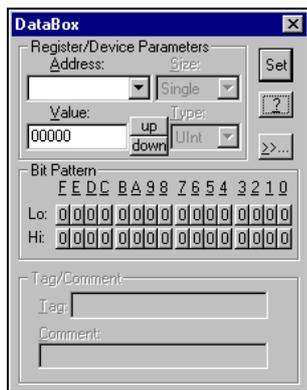
Press the Enter key. A new line will be inserted and the editing area will also be enlarged by one line.

To edit including Circuit 3, use Shift + ↓ to enlarge the editing area to Circuit 3 before a new line inserted.

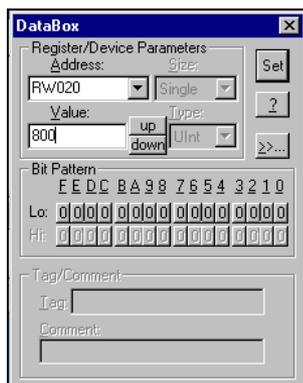
5. Advanced Editing



The Auxiliary Monitor window will open in the programming window. This window allows current values to be set for any register and device.



Clicking the mouse at the position of the cursor in the Auxiliary Monitor window will display the DataBox. Enter the register number and data value that you wish to set in the Auxiliary Monitor window.

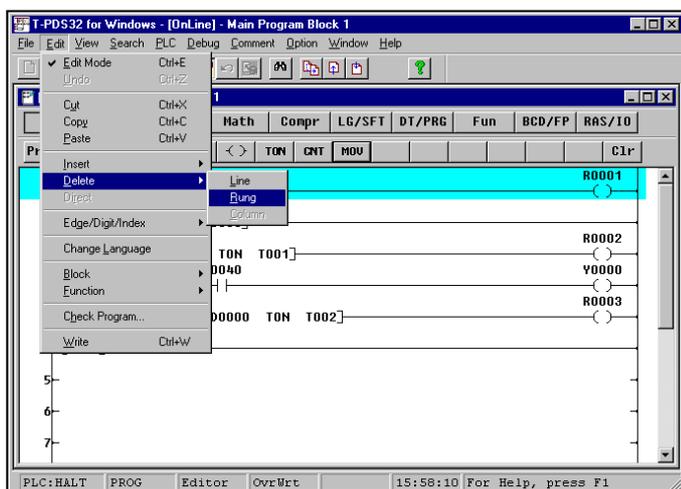


For "Addresses," you will designate register RW020. Enter "R20". "0" will be displayed for the current value in the "Value" area. Enter the desired setting on the keyboard and press Enter. Register RW020 will be registered in the Auxiliary Monitor window and the current value will be replaced with the data you have just entered. To close the DataBox, click the Close button in the upper right-hand corner.

5. Advanced Editing

5.3 Deleting Circuits

This section covers how to delete unnecessary circuits. In this example, you will delete the circuit that waits for ten seconds after startup in Circuit 1.

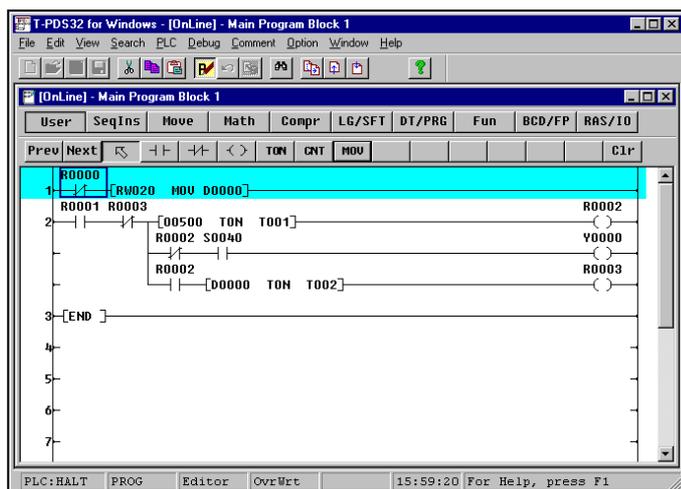


Move the box cursor onto the circuit that you want to delete.

On the Edit menu, point to Delete and click Rung on the submenu.

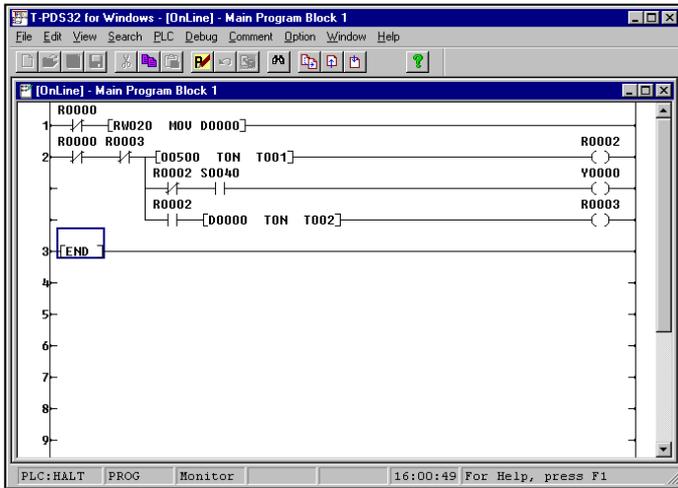


A message will appear asking you to confirm that you really want to delete the circuit. Click Yes.



The designated circuit will be deleted and the subsequent circuits will move up.

5. Advanced Editing

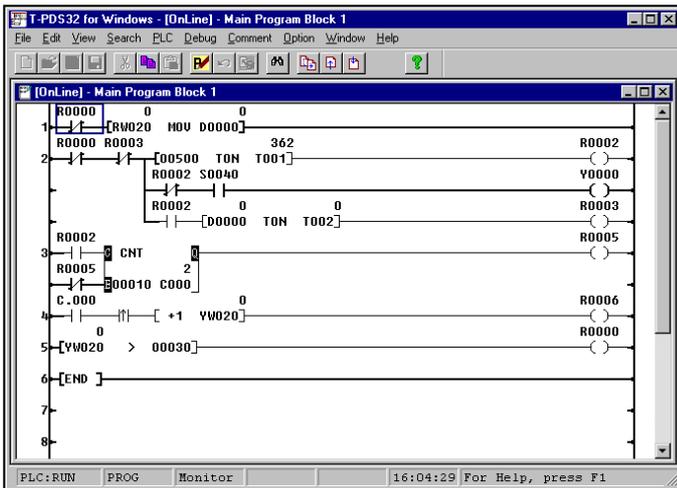


When you have deleted Circuit 1, change the NO contact of R0001 at the beginning of circuit 2 to the NC contact of R0000.

5. Advanced Editing

5.4 Complex Circuits

This screen shows a counter function added to the flicker circuit. Try creating this program circuit as a final exercise.



- The number of R0002 turning ON is counted in Circuit 3.
The counter is reset every 10 counts.
- The value for output register YW020 is increased by 1 every 10 counts in Circuit 4.
- And in Circuit 5, when the value for output register YW020 exceeds 30, R0000 is turned on and flickering stops.

When an I/O card corresponding to YW020 is installed, the LEDs on the I/O card indicates the counting operation. When the I/O card is not installed, you can confirm the operation on the program monitor screen or data monitor screen.

<Summary>

Insert one line in Circuit 3.

- Circuit 3

- | | | | |
|-------------------|-------------------|----------|---------------|
| Select NO contact | Click left button | Enter R2 | Press [Enter] |
| | | | Press [Enter] |
| Select NC contact | Click left button | Enter R5 | Press [Enter] |

Move the box cursor to the right of the NO contact.

In the Ladder Instruction toolbar, display the CNT instruction

- | | |
|------------|-------------------|
| Select CNT | Click left button |
|------------|-------------------|

Move cursor to lower left of CNT instruction

- | | |
|----------|---------------|
| Enter 10 | Press [Enter] |
| Enter C0 | Press [Enter] |

- | | |
|-------------|-------------------|
| Select coil | Click left button |
|-------------|-------------------|

- | | |
|----------|-------------------------------|
| Enter R5 | Press [→] [→] [→] and [Enter] |
|----------|-------------------------------|

- Circuit 4

- | | | | |
|-------------------|-------------------|-----------|---------------|
| Select NO contact | Click left button | Enter C.0 | Press [Enter] |
|-------------------|-------------------|-----------|---------------|

- | | |
|-----------------------|-------------------|
| Select Pulse (rising) | Click left button |
|-----------------------|-------------------|

Select the arithmetic instruction group

- | | |
|-------------|-------------------|
| Select Math | Click left button |
|-------------|-------------------|

- | | |
|-----------------------|-------------------|
| Select +1 (increment) | Click left button |
|-----------------------|-------------------|

- | | |
|------------|---------------|
| Enter YW20 | Press [Enter] |
|------------|---------------|

- | | |
|-------------|-------------------|
| Select coil | Click left button |
|-------------|-------------------|

- | | |
|----------|---------------|
| Enter R6 | Press [Enter] |
|----------|---------------|

- Circuit 5

Select the comparison instruction group

- | | |
|--------------|-------------------|
| Select Compr | Click left button |
|--------------|-------------------|

- | | |
|-------------------------|-------------------|
| Select > (greater than) | Click left button |
|-------------------------|-------------------|

- | | |
|------------|---------------|
| Enter YW20 | Press [Enter] |
|------------|---------------|

- | | |
|----------|---------------|
| Enter 30 | Press [Enter] |
|----------|---------------|

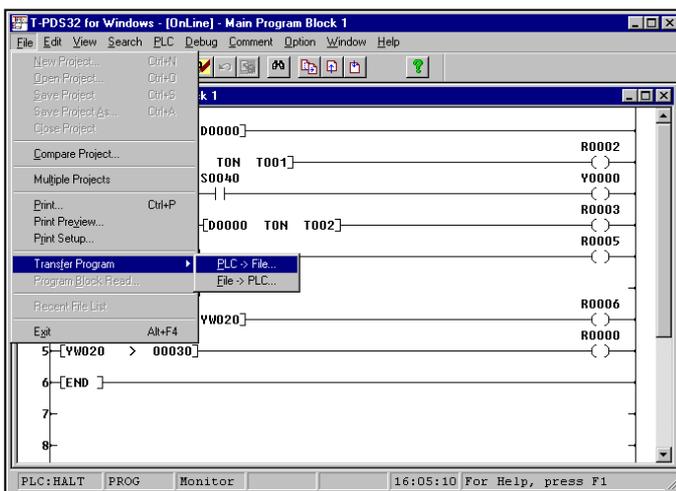
- | | |
|-------------|-------------------|
| Select coil | Click left button |
|-------------|-------------------|

- | | |
|----------|-----------|
| Enter R0 | Press [→] |
|----------|-----------|

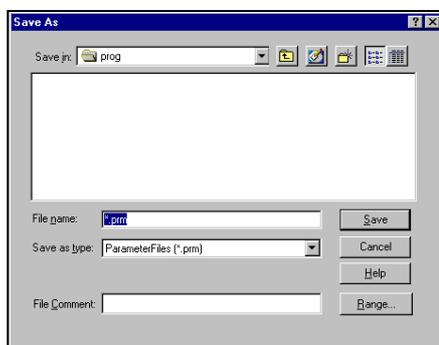
6. Saving Program

6.1 Save to Disk

The Transfer Program command is used to save the programs that have been created to disk or to load them from disk.



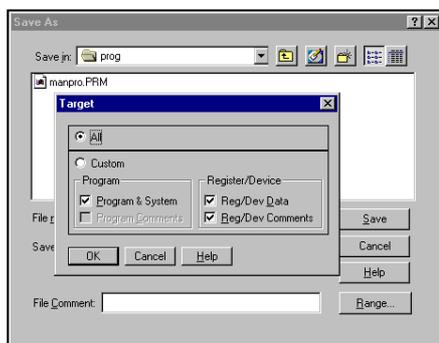
On the File menu, point to Transfer Program and click PLC -> File on the submenu.
(Toolbar is also available)



A dialog box will appear on the screen. This box is used to save data from the controller to disk.

It shows data in the folder currently available. To change the folder, click on the folder list box and select the desired folder.

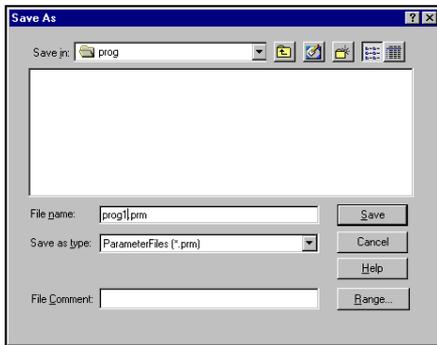
When the folder has been selected, a list of files in that folder will appear in the File Name list box.



Select "Range" and specify the items to be transferred.

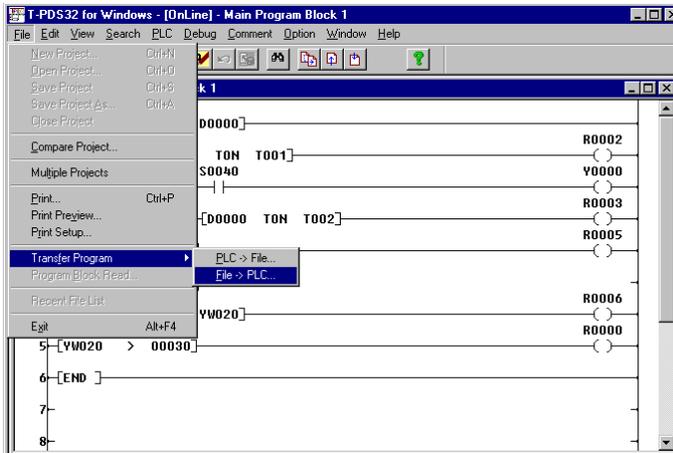
When a comment has been registered in the controller, the comment will be saved under the Comment File as the same file name.

6.Saving Program



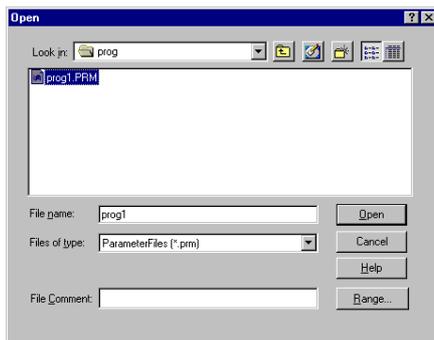
Enter the name of the file in the File Name text box.
In this example, enter "prog1".
After entering the file name, click OK.
The program will be stored in that file.

6.2 Loading Programs from Disk



To load programs from disk, point to Transfer Program on the File menu and click File -> PLC on the submenu. (Toolbar is also available)

A dialog box will appear. This dialog box is used to enter the name of the file to be loaded from the disk.



Designate the name of the file to be loaded from the disk.

You may change the folder in the same manner as when saving programs to disk.

To specify the name of the file for loading from the disk, either enter the name on the keyboard in the File Name text box or select the name from the File Name list box.

After entering the file name, click OK. The program will be loaded from that file.

7. Beyond the Basic

7. Beyond the Basic

7.1 Register/Device Comment

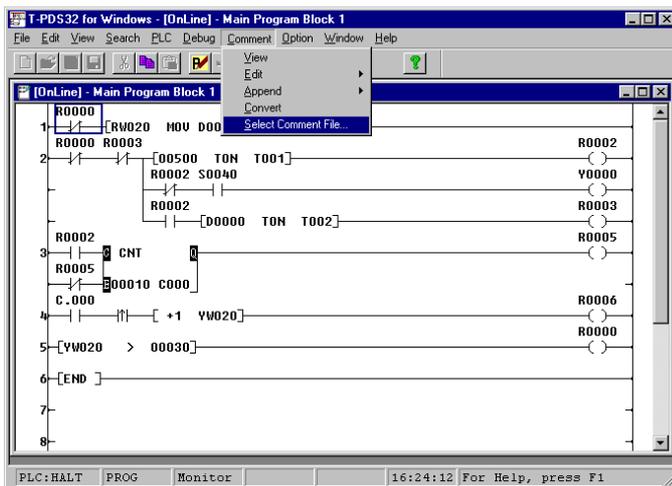
You can assign comments to the program blocks, circuits, relays and registers. This allows you to have the relays and devices displayed with comments in the program, and the program blocks and circuits with complementary comments.

Display the flicker circuit created in Chapter 5 on the screen.

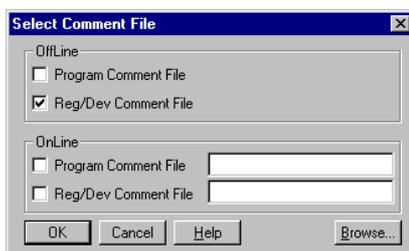
In this example, you will assign the tag name "DATA1" to the D000 data register used in this program.

7.1.1 Select Comment File

Note that assigning comments to relays and registers and saving these names will require files.



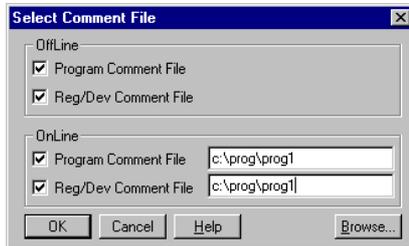
On the Comment menu, click Select Comment File. A dialog box allowing you to select the comment file will appear.



When you use register/device comment in offline mode, click the Reg/Dev Comment File check box in OffLine area. Click OK.

Then the temporary comment file is created, and you can use the register/device comment.

7. Beyond the Basic



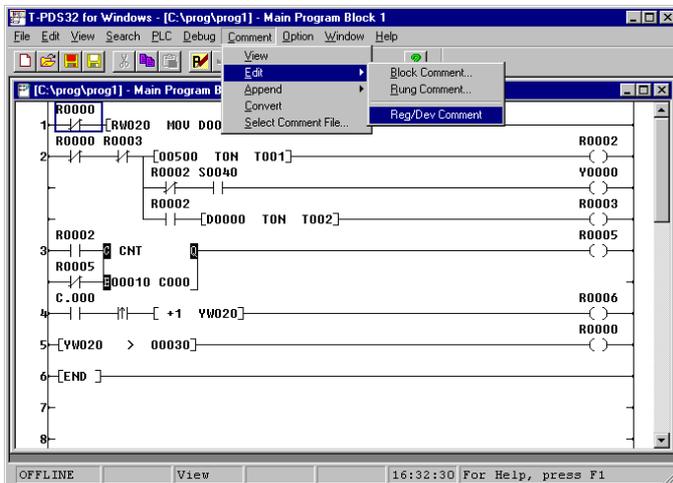
When you want to display the register/device comment in online mode, click the Reg/Dev Comment File check box in OnLine area. Clicking Browse displays a dialog box for selecting the file for referring.



Select the comment file name and click OK. If you are designating a new file, enter the file name in the Data Comment File text box. The extender ".CMT" is used for data comment files, but you do not need to enter this.

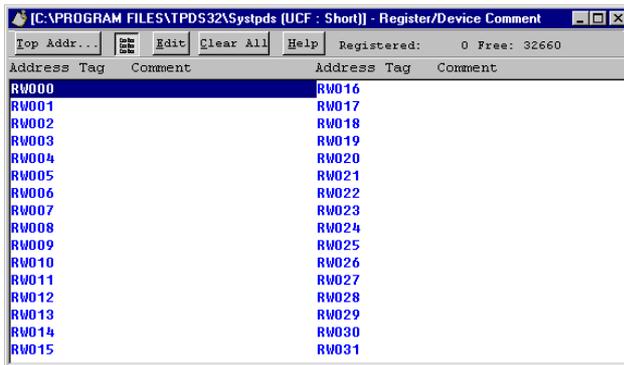
7. Beyond the Basic

7.1.2 Registering Names



On the Comment menu, point to Edit and click Reg/Dev Comment on the submenu.

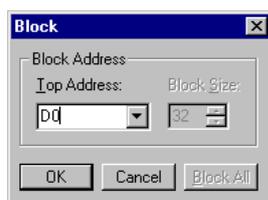
The Register/Device Comment window will appear.



The number of currently registered items is shown in the upper right-hand corner, as well as the number of free items.

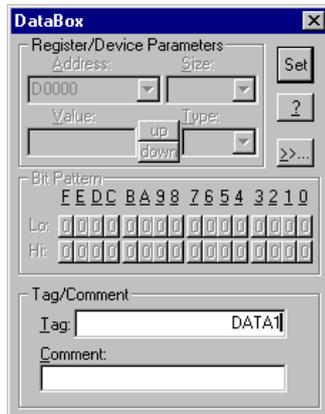
To register a name for D0000, you must change the display area. Click Top Addr on the toolbar.

A dialog box allowing you to designate the starting address will appear.



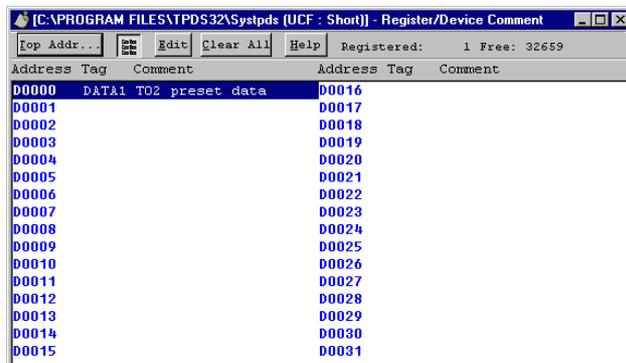
Enter "D0" in the Top Address text box. The Block Size item is fixed at 32. Then click OK.

7. Beyond the Basic



When D0000 - D0031 appears on the screen, click Edit on the toolbar to open the DataBox data editing dialog box. Comments as well as relay and register names may be registered with the Comment function.

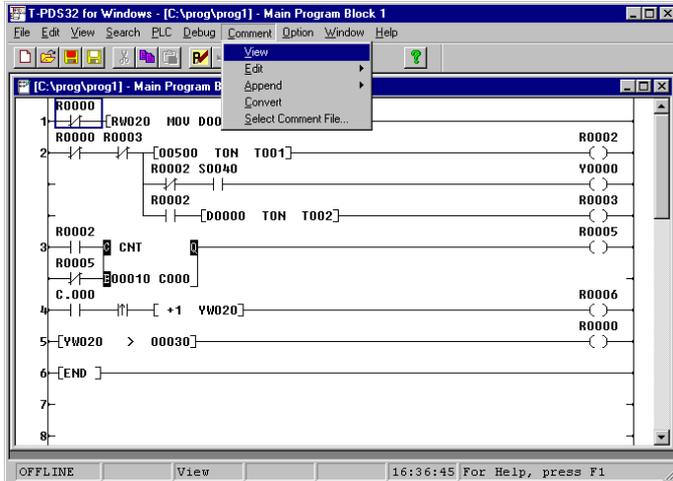
Check to make sure that the cursor is in the Tag text box, then enter "Data 1" and click OK. Close the DataBox dialog box by clicking the Close button in the upper left-hand corner.



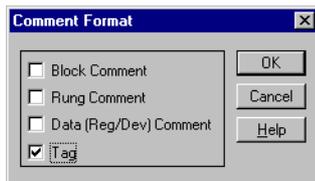
The tag name will appear under Tag in the Register/Device Comment window.

7. Beyond the Basic

7.1.3 Displaying Names



When the names and comments have been registered, click View on the Comment menu.
(Toolbar is also available)



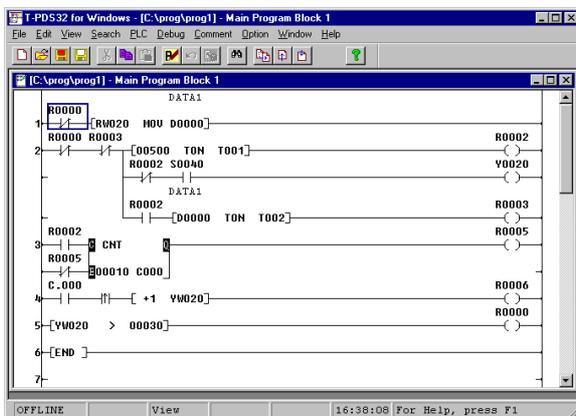
A dialog box allowing you to specify the display format for comments will appear.

Click in the Tag check box so the box is checked.

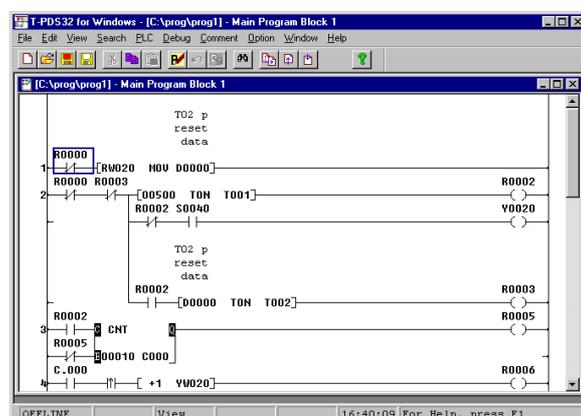
The tag name is displayed above the register and device numbers.

Check this in the program. The "DATA1" above the ON delay timer and MOV symbol operand D0000. When the Data (Reg/Dev) Comment is specified for display, comment will appear.

- Tag Display



- Comment Display

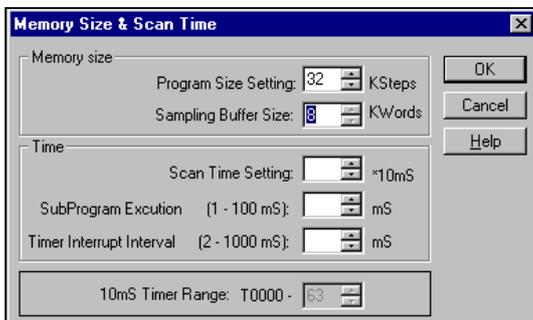


7.2 Sampling Trace

The controller has a function that enables you to sample and display changes in device status and register values during program execution. In this example, you will use this function to check on device and register trends in the flicker circuit.

7.2.1 Setting the Sampling Buffer

In order to sample data, it is necessary to secure a buffer, i.e. the memory area in which the sampling data will be stored. This is set in the system data.



On the PLC menu, click System Parameters. The System Parameters screen will appear. Click Memory Size & Scan Time.

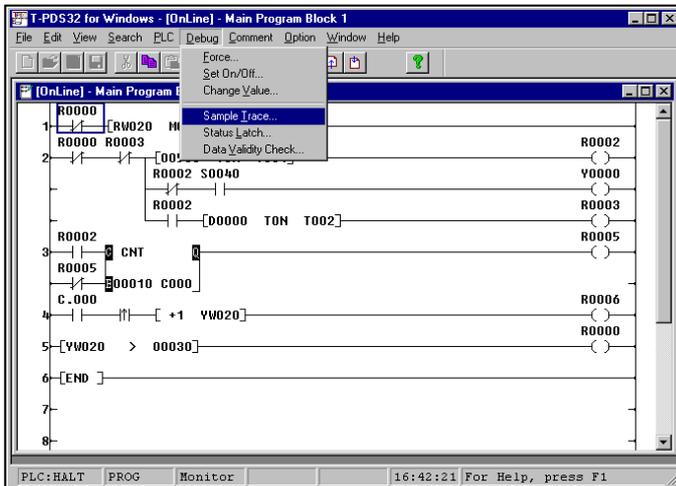
Then set the Sampling Buffer Size in the Memory Size area. For the T3, the sampling buffer may be set up to a maximum of 8KW.

Additional Information

- On the T3/T3H the F register or an IC memory card is used for the sampling buffer. Note that setting a sampling buffer will decrease the amount of memory used by the program by the amount of the buffer setting.
- On the T2, IC cards are used to store sampling data.
- When performing a sample trace on the T2, be sure to insert an IC memory card and assign the memory card using the "I/O Card Allocation" procedure. The sampling buffer size is fixed at 8KW.
- For the T2E/T2N, the sampling buffer size is fixed at 8kW and uses internal memory.
- For the T1/T1S, the sampling buffer size is fixed at 1kW and uses internal memory.
- For the S2T, the sampling buffer size is fixed at 8kW and uses internal memory.

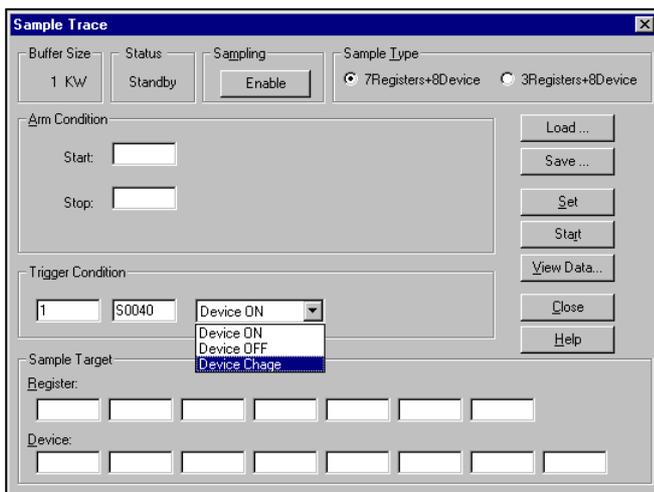
7. Beyond the Basic

7.2.2 Setting the Sampling Condition



On the Debug menu, click Sample Trace. The Sample Trace dialog box will appear.

The Sample Trace dialog box is used to set the registers for data sampling, the sampling trigger condition and other data.



First check to make sure that the sampling buffer size set as system data is displayed in the upper left-hand corner.

In this example, you will set the trigger condition.

The trigger condition sets the timing for data sampling during program execution (during scanning). The trigger condition is specified as a device and a register condition, such as when the device status has changed or when the register has reached a certain constant value.

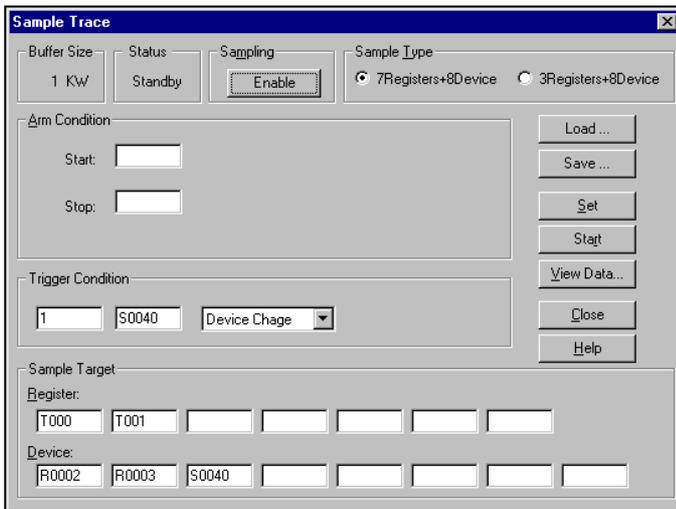
In this example, you will set the trigger to be activated when the timing relay (S0040) goes ON or OFF.

Move the mouse to the Trigger Condition text box and enter "1".

This designates how many times sampling is performed when the sampling conditions are fulfilled. Setting the value to "1" causes sampling to be performed for each scan that fulfills the trigger conditions.

Move the mouse pointer to the right and enter "S0040" for the sampling device. Then select the operation condition to one of the choices in the list box (Device ON, Device OFF or Device Change). In this example, you will set it to Device Change.

7. Beyond the Basic



When the trigger conditions have been set, move the mouse pointer to the Sample Target area.

This area is used to designate the devices and registers for sampling. Enter the device and register numbers.

In this example, enter T000 and T001 for the registers and R0002, R0003 and S0040 for the devices.

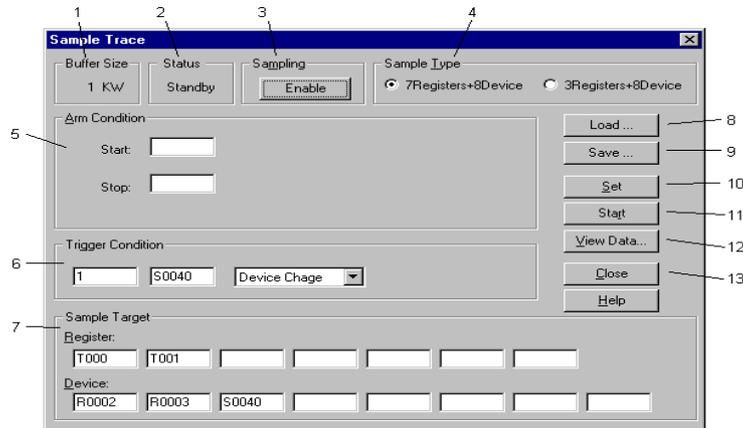
When the settings are complete, click Set to save them.

As a result of these settings, when the S0040 relay changes from ON to OFF or vice versa, the current values for timer 0 and timer 1 and the ON/OFF status of R0002, R0003 and S0040 will be sampled.

The sampling conditions have now been set. Click Enable at the top of the dialog box. This completes the preparations for sampling.

Execute the program using the key-switch on the T3 or PLC Control. When the program is ready for execution, click Start. Sampling will begin. When sampling has been performed for 10 seconds or more (and flickering has begun), click Stop. Sampling will stop and the program operation status will be stored in the sampling buffer.

7. Beyond the Basic



<Sample Trace dialog box>

- 1 - Buffer Size: Shows the sampling buffer size (0 - 8kw).
- 2 - Status: Shows the status of sampling execution.
 Executing: Sampling in progress
 Standby: Sampling stopped
- 3 - Sampling: This button shows whether sampling is enabled or disabled. The status can be toggled by clicking the button.
 Enable: Sampling is enabled. Clicking the button changes this to Disable and sampling is stopped.
 Disable: Sampling is disabled. Clicking the button changes this to Enable.
- 4 - Sample Type: This area is used to select the number of registers and devices sampled. You may choose either of two options:
 7 registers + 8 devices
 3 registers + 8 devices
- 5 - Arm Condition: This area is used to set the arm conditions. Setting these values causes sampling to begin and end automatically in line with the arm conditions.
 Start: The start condition for sampling. Enter a register or device, a timing value or (in the case of numerical change) a numerical value in the box.
 Stop: The stop condition for sampling.
 After: Sets how many sampling scans are performed after the Stop conditions are met.
- 6 - Trigger Condition: Sets the timing for the sampling operation. The trigger condition is set in the same manner as Arm Condition above. The setting for number of trigger operations determines the number of times sampling is performed each time trigger conditions are fulfilled. If this value is set to 1 or left blank, sampling is performed each time the conditions are fulfilled. Similarly, if the register and device boxes are left blank, sampling is performed for each scan.
- 7 - Sample Target: Sets the registers and devices for which sampling is performed.
- 8 - Load: This button is used to load files containing sampling conditions and reflect these conditions on the screen.
- 9 - Save: This button is used to save the sampling conditions set on the screen to a file.
- 10 - Set: This button sets the sampling conditions currently displayed on the screen.
- 11 - Start: Clicking this button starts the sampling procedure in sampling ready status. The button changes to "Stop" when sampling begins. Clicking the Stop button stops the sampling process.
- 12 - View Data: This button loads the results of the sampling procedure from the PLC and displays them in the Sample Trace Data View window.
- 13 - Close: Clicking this button closes the sample trace dialog box.

7.2.3 Viewing Sampling Trace Data

In this example, you will view the sampled data. Click the View Data button to display all of the sampled data.

	1	2	3	4	5	6	7	8	9	10
T000	0	0	0	0	0	0	0	0	0	0
T001	385	390	395	400	405	410	415	420	425	430
R0002	○	○	○	○	○	○	○	○	○	○
R0003	○	○	○	○	○	○	○	○	○	○
S0040	○	●	○	●	○	●	○	●	○	●

The top part of the data shows the timer register values. The bottom part shows the device on/off status. White circles indicate ON status and black circles indicate OFF status.

The numbers at the very top are scan numbers. You may use the Set Scan No. button to display the data from any scan number. Click Prev to display the data for the previous ten scan items. Click Next to display the data for the next ten scan items.

<Sample Trace Data View dialog box>

- 1 - Set Target: Clicking this button displays the Set Target dialog box, enabling you to set the devices and registers to be displayed.
- 2 - View Graph: Clicking this button displays a dialog box with a graph of the sample data.
- 3 - Set Scan No: Clicking this button displays a dialog box used to set the first scan number for the sample data.
- 4 - Data Save: Save the sample data to the file in CSV format.
- 5 - Prev: Shows the previous page of data.
- 6 - Next: Shows the next page of data.
- 7 - Quit: Returns to the Sample Trace dialog box.

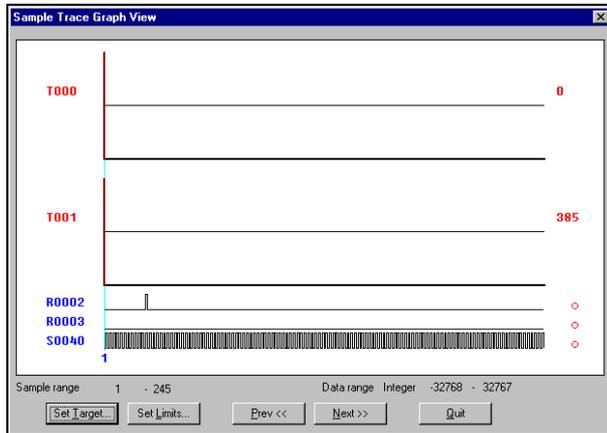


- Set Target screen

7. Beyond the Basic

7.2.4 Timing Chart Display

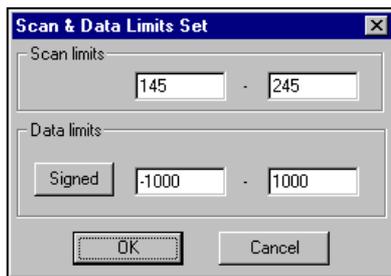
In this example you will view the time chart for this data.



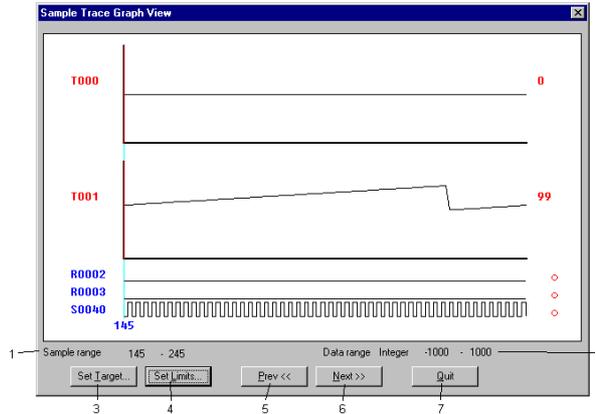
Click the View Graph button. The sampled data will be displayed in the form of a time chart.

The time chart shows the scans from number 1 to number 256.

In this format, the data is a bit difficult to view, so you should change the scan range (the scale of the time axis in the chart).



Click the Set Limits button. A dialog box will appear, enabling you to set the display range for the data.



<Sample Trace Graph View>

- 1 - Sample Range: Shows the lower and upper limits for the currently displayed scan range.
- 2 - Data Range: Shows the lower and upper limits for the display data.
- 3 - Set Target: Clicking this button displays the Device/Register Data dialog box.
- 4 - Set Limits: Clicking this button displays the Display Data Range dialog box.
- 5 - Prev: Shows the previous page of data.
- 6 - Next: Shows the next page of data.
- 7 - Quit: Returns to the Sample Trace Data View screen.

Additional Information

The following keyboard shortcuts can also be used:

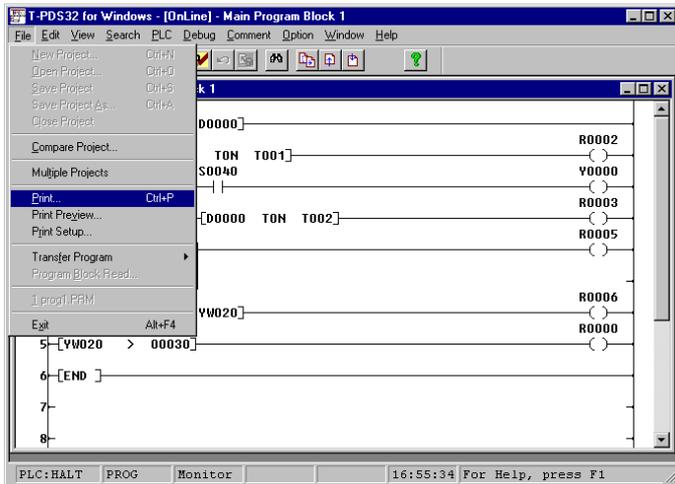
- Left/right arrow keys Moves the sample cursor.
- T Displays the Device/Register Data dialog box.
- L Displays the Display Data Range dialog box.
- P Shows the previous page of data.
- N Shows the next page of data.

7. Beyond the Basic

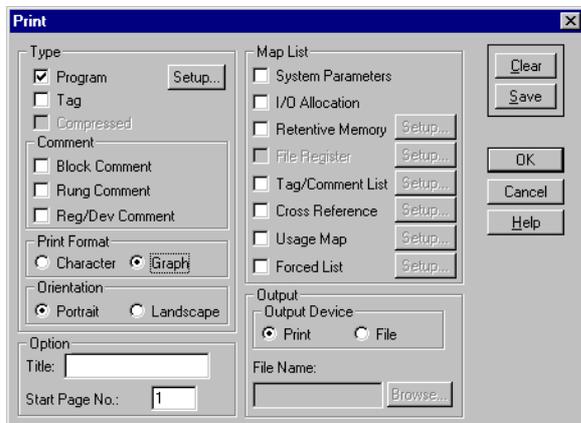
7.3 Printing the Program

The Print command on the File menu allows you to print out the program, system information, device/register data, cross-reference, etc.

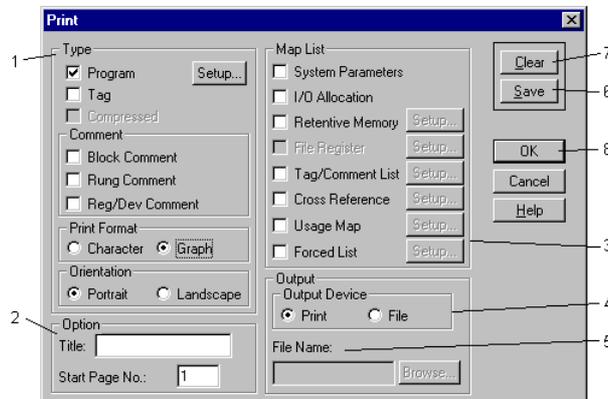
In this example, you will use this command to print out the program.



On the File menu, click Print.
(Toolbar is also available)



The Print dialog box will appear.



<Print dialog box>

1 - Type:

Program:

This item is used to specify the program print-out format.

Check here to print out the program. The program range to be printed can be specified.

Tag:

Check here to print out the program with the tags.

Comment:

Used to add the comments on the program. The following types of comments are available.

- Block Comment
- Rung Comment
- Register/Device Comment

Print Format:

Select the print out mode either character mode or graphics mode.

2 - Option:

This item is used to specify the print-out header title and the starting page number.

3 - Map List:

This item is used to select the optional maps to be printed.

System Parameters:

Check here to print the system parameters.

I/O Allocation:

Check here to print the I/O allocation information.

Retentive Memory:

Check here to print the data of the retentive registers.

File Registers:

Check here to print the data of the file registers (F registers).

Tag/Comment List:

Check here to print the list of the register/device comments.

Cross Reference:

Check here to print the cross-reference list.

Usage Map:

Check here to print the register/device usage map.

Forced List:

Check here to print the list of forced devices/coils.

4 - Output:

This item is used to select the output device.

5 - Output Device:

Select the output device either printer or file.

File Name:

When file is selected as the output device, enter the file name here.

6 - [Save] button:

Saves the print settings into the system file.

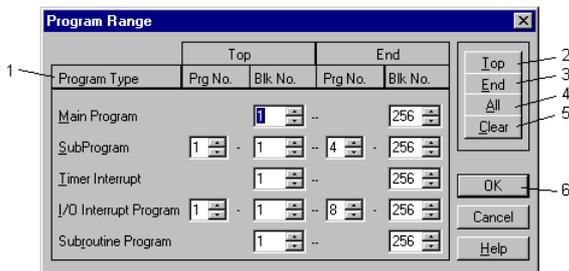
7 - [Clear] button:

Clears the setting.

8 - [OK] button:

Starts the printing.

7. Beyond the Basic

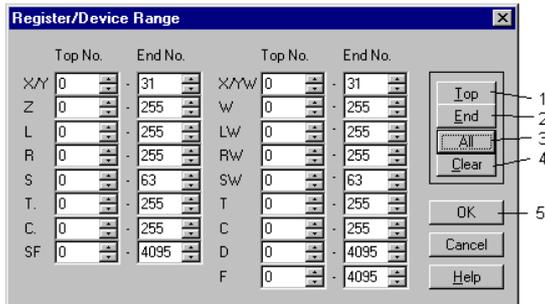


On the Print dialog, when you check the Program and click the [Setup] button, the Program Range dialog box will appear. Set the block range for each program type to be printed on this dialog box.

<Program Range dialog box>

- 1 - Program Type: Sets the program ranges to be printed.
- 2 - Top: Sets the starting program number (if any) and the block number to be printed on the cursor position.
- 3 - End: Sets the last program number (if any) and the block number to be printed on the cursor position.
- 4 - All: Sets all the program range.
- 5 - Clear: Clears the settings.
- 6 - OK: Registers the settings and returns to the Print dialog box.

When you want to print the system parameter, I/O allocation, cross-reference, etc., check the desired items on the Map List.



When you check the Retentive Memory, File Register, Tag/Comment List, Cross Reference, Usage Map, or Forced List, click the [Setup] button to set the register range to be printed. The Register/Device Range dialog box will appear.

<Register/Device Range dialog box>

- 1 - Top: Sets the starting register address to be printed on the cursor position.
- 2 - End: Sets the last register address to be printed on the cursor position.
- 3 - All: Sets all the register range.
- 4 - Clear: Clears the settings.
- 5 - OK: Registers the settings and returns to the Print dialog box.

When you have finished the necessary setting, click the [OK] button on the Print dialog box. The print-out will be started.

If you want to save the setting, click the [Save] button on the Print dialog box. The current setting is saved in the system file, and it will be displayed when the next time you open the Print dialog box.

Index

A - E

Automatic I/O Allocation	38
Auxiliary Monitor	58
Changing the Operation Mode	25
Checking Operation	52
Checking Register Numbers	40
Clear Memory	31
Clear the Instruction	49
Comment	15
Comment file	28
Comment Format	70
Correcting the Instruction	49
Data Monitor	52
Databox	58
Debug	15
Deleting Circuits	60
Device Name	66
Displaying Names	70
Edit	12
Edit mode	41
Executing the Program	51

F - J

File	11
Finishing the Program	47
Halt	25
Help	16
Insert	50
Inserting Circuits	53
Installation	6
Instruction toolbar	42
I/O Allocation Setup	38

K - O

Key Assignment to the Instruction bar	21
Key Operation	18
Ladder	41
Loading Programs from Disk	65
Map List	79
Memory Management	31
Memory Size	33
Menu Configuration	11
New Project	29
Offline	28
Online	28
Online I/O Module Replacement	37
Open Project	30
Opening a New Project	29
Opening an Existing Project	30
Operating Environment	5
Option	15
Overwrite	50

Index

P - T	
PLC	14
PLC Control	25
PLC Control Box	26
Print	78
Printing the Program	78
Programming	41
Programming screen	41
Register/Device Comment	68
Registering I/O Cards	36
Registering Names	68
Registering System Parameters	32
Run	51
Sample Program	22
Sample Trace	71
Save to Disk	63
Scan Time	33
Screen Configuration	9
Search	13
Select Comment File	66
Setting Data	57
Selecting Functions	10
Setting the Sampling Buffer	71
Setting the Sampling Condition	72
SFC	41
Switching Between Online and Offline Status	27
System Disks	6
System Parameter	32
System Startup	24
Time Chart	76
Timer Interrupt Interval	33
Toggle Address/Number of Words	40
Toolbar Configuration	17
U - Z	
Vertical Connection	46
View	13
Viewing Sample Trace Data	75
Window	16
When an I/O Card is Installed	38
When No I/O Card is Installed	38
Writing the Program	48

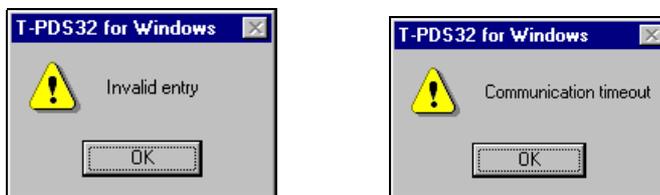
Error Message

Error Message Overview

There are 4 types of error messages as follows.

A. Operation Error

These error messages are displayed for the T-PDS operation which you attempt to do. Communication error between T-PDS and PLC is also included in this type. It is displayed in the message box.



B. Compile Error

These errors are detected in the T-PDS when edited program is compiled. It is displayed in the message box.



C. PLC Status Line

When the T-PDS is on-line mode, the PLC's operation mode (RUN, HALT, or ERROR) and alarm status are displayed in the status line.



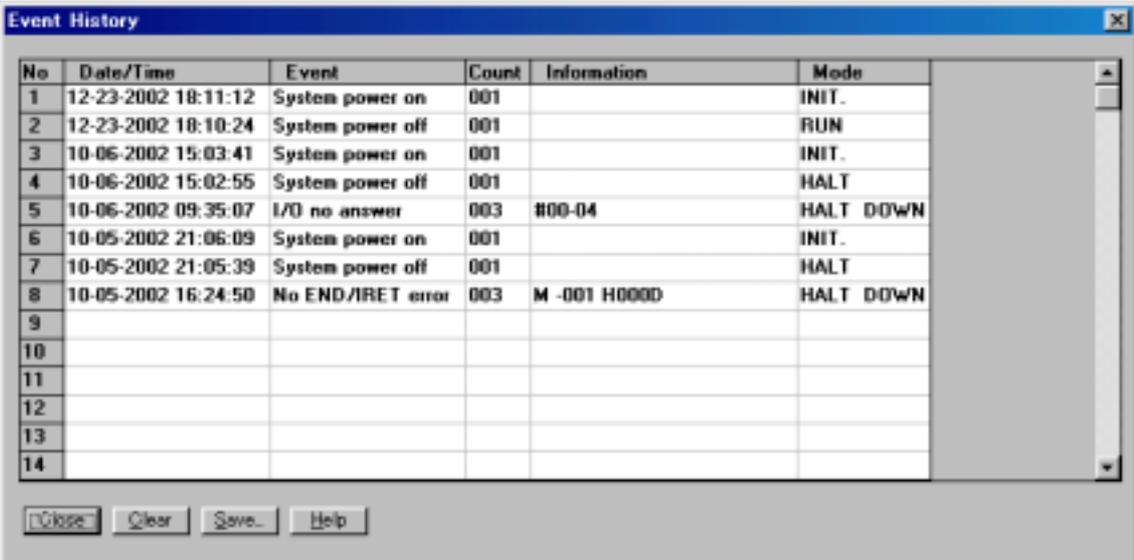
- ↑ PLC mode
RUN
HALT
ERROR
- ↑ Alarm status
 - PROG: Programming enabled.
 - PROT: Program is write-protected.
 - LOAD: Under program down-loading.
 - DIAG: User diagnostic instruction was executed.
 - SCAN: Time-over for the constant scan setting.
 - TL-F: TOSLINE-F10 error.
 - TL-S: TOSLINE-S20 error.
 - BATT: Battery alarm.

Error Message

D. Event History Table

When the PLC detects some abnormality in its diagnostic checks, it is recorded in the PLC memory called Event history table. In the Event history table, the last 30 event messages (15 in case of T1/T1S) are stored in this table. The contents of the Event history table can be monitored on the T-PDS screen by [PLC] [Event History] menu.

<Event History Table>



No	Date/Time	Event	Count	Information	Mode
1	12-23-2002 18:11:12	System power on	001		INIT.
2	12-23-2002 18:10:24	System power off	001		RUN
3	10-06-2002 15:03:41	System power on	001		INIT.
4	10-06-2002 15:02:55	System power off	001		HALT
5	10-06-2002 09:35:07	I/O no answer	003	#00-04	HALT DOWN
6	10-05-2002 21:06:09	System power on	001		INIT.
7	10-05-2002 21:05:39	System power off	001		HALT
8	10-05-2002 16:24:50	No END/IRET error	003	M-001 H000D	HALT DOWN
9					
10					
11					
12					
13					
14					

Date	The date the error occurred (requires RTC/calendar).
Time	The time the error was detected (requires RTC/calendar).
Event	Description of what occurred.
Count	Number of retries to correct the event.
Information	Additional information about the event.
Mode	The operation mode when the event occurred.
DOWN	The event caused the controller to enter the Error Mode.

[Save] button is used to save the Event history table contents into the disk file.

Usually a PLC goes into the error mode when one of its diagnostic checks determines that something has occurred which interferes with normal operation. When a controller is in the error mode, all outputs turn OFF and operation stops. Nothing else is possible until Error Reset is executed. The basic recovery procedure is:

- (1) Execute Error Reset (reset the error and put the PLC in the Halt Mode).
- (2) Study the Event History Table.
- (3) Make the necessary corrections.
- (4) Return to the Run Mode.

Error Message List

A...

Message	Type of Error	Description
Address limit over	Operation error	The register address is not valid.
Address over Limit the size?	Operation error	The block specified will exceed the address range. Limit the block size automatically?
Address setting error	Operation error	The address specified is not correct.

B...

Message	Type of Error	Description
Batt voltage drop	Event history	Battery voltage drop or back-up data error was detected. Replace the battery if it is used.
Block separation impossible (max 16 blocks)	Operation error	Number of divided blocks in the data monitor is 16 blocks maximum.
Block size error	Operation error	Specified block size is illegal.
Block size error	Operation error	The block number specified is out of the allowable range.
Block/rung comment file is not specified	Operation error	Block/rung comment file has not been specified.
BLOCKEDI.EXE running	Operation error	The edit block function has already activated.
Boundary error	Event history	The index modified operand exceeds the allowable address/data range. Info 1: Program type - block No. Info 2: Offset address in the block Info 3: Function No. Check the program for the index registers data.
Branch connection below MCS/JCS	Compile error	MCS and JCS must be the last instruction in a rung.
Branch connection error	Operation error	The program cannot be displayed because it contains illegal branch connection. (Program abnormal)
Branch connection error	Compile error	In the SFC program, combination of divergence and convergence is not correct.

Error Message

C...

Message	Type of Error	Description
Can't check register/device comment file type	Operation error	The format type, long or short, of the comment file could not be confirmed.
Cannot connect with other instruction	Compile error	This instruction cannot be connected with other instructions.
Cannot copy because of memory capacity over	Operation error	The block copy operation specified will cause memory capacity over.
Cannot delete	Operation error	The delete range specified is illegal.
Cannot delete line	Operation error	The current cursor position is illegal to execute the line delete operation.
Cannot execute because of memory allocation error	Operation error	Block edit cannot be started because of insufficient memory.
Cannot execute because of TPDS.EXE not loaded	Operation error	The block edit cannot be started because T-PDS has not been executed.
Cannot insert	Operation error	The current cursor position is illegal to execute the insert operation.
Cannot insert line	Operation error	The current cursor position is illegal to execute the line insert operation.
Cannot Load Spin.VBX Place the file on the path	Operation error	The Spin.vbx file was not found in the folder of Tpds.exe file.
Cannot move because of insufficient empty blocks	Operation error	The block move operation specified is not possible because empty blocks are not sufficient.
Cannot Open File	Operation error	The file specified could not be opened.
Cannot Save This File	Operation error	Saving into the file was failed.
Changing item not found	Operation error	The target was not found for the search & replace function.
Channel Size Error	Operation error	Channel number specified for F10 assignment is out of allowable range.
Clock-calendar err	Event history	An error was detected in the calendar LSI. (no error down) Reset the clock-calendar data.
Coil is connected to left bus	Compile error	Coil cannot be connected to the left bus directly.

Error Message

Message	Type of Error	Description
Column over	Operation error	The program cannot be displayed because it contains excess columns. (Program abnormal)
Combination error	Operation error	The combination of I/O type and size is invalid.
Comm format error	Operation error	Communication format error has occurred.
Command line not found	Operation error	Command line could not be found.
Comment character size error	Operation error	Data comment character size exceeds the limit.
Comment file insert error	Operation error	An error occurred during writing to the comment file.
Comment file open error	Operation error	The comment file could not be opened.
Comment file write error	Operation error	An error occurred during writing to the comment file.
Comment space full	Operation error	The comment memory is full.
Comment space full	Operation error	The comment memory is full.
CommonData Lock Error	Operation error	Common data could not be obtained.
Communication busy	Operation error	When the programmer port and the computer link port are used simultaneously, the PLC CPU cannot respond due to busy status for other communication support.
Communication err	Operation error	Communication error has occurred.
Communication error	Operation error	Communication error between T-PDS and PLC has occurred.
Communication timeout	Operation error	Communication time-out error occurred.
Connection error	Compile error	In the SFC program, there are illegal connections.
Connection error for edge detect instruction	Compile error	No instruction cannot be connected to the output of the edge detect modified instruction.
Connection error for multi-input instruction	Compile error	Vertical connection point cannot be connected directly with the input of a multi-input instruction. (except for the enable input)
Contact is connected to right bus	Compile error	Contact instruction cannot be connected to the right bus.

Error Message

Message	Type of Error	Description
Control inst incl.	Operation error	In the on-line program changes, the following instructions cannot be deleted or added. FOR, NEXT, MCS, MCR, JCS, JCR, END, JUMP, LBL, CALL, SUBR, RET, IRET
CRect over	Operation error	The printing space is not sufficient.

D...

Message	Type of Error	Description
Data type mismatch	Operation error	The data format specified is not allowed for the operand.
Device context error	Operation error	The device context could not be obtained.
Direct Instruction or Operand	Operation error	Specify the instruction or operand to be searched.
Disk full	Operation error	The disk is full.
Duplicate coil	Operation error	Duplicate coil was detected in the program check function.
Duplicate entry No.	Event history	LBL or SUBR instruction is duplicated Info 1: Program type - block No. Info 2: Offset address in the block Info 3: Entry No. Check the program.
Duplicate I/O reg	Event history	Duplication of XW/YW registers is detected. Info 1: Unit No. - slot No. Info 2: Register address Check the I/O allocation information (unit base address setting).
Duplicate mark information	Operation error	The mark ID specified has already been registered.
Duplicate Registers	Operation error	X/Y registers are duplicated due to incorrect unit base address setting.
Duplicate SFC No.	Event history	The SFC program No. is duplicated. Info 1: Program type - block No. Info 2: SFC program No. Check the program.
Duplicate step No.	Compile error	SFC step number is duplicated.

E...

Message	Type of Error	Description
Edit line over	Operation error	Editing range exceeds 11 lines.
Edit size over	Compile error	Number of steps in the rung exceeds 132 steps.
EEPROM BCC error	Event history	BCC error was detected in the user program memory (built-in EEPROM). Initial load was not executed. Info 1: Illegal BCC data Check the program. Then write into the EEPROM again.
EEPROM warning	Event history	The number of times of EEPROM write has exceeded the life (100,000 times). Info 1: Excess times of EPROM write
EEPROM write error	Operation error	Error occurred during writing into built-in EEPROM.
Empty block has been specified	Operation error	An empty block was specified as copy source.
END exists in subroutine	Compile error	END instruction cannot be programmed in the subroutine.
Entered tag(s) has already been registered	Operation error	Entered tag is duplicated.
Entry block has been specified	Operation error	Programmed block cannot be specified as copy destination.
Ethernet not support	Operation error	Ethernet is not supported in the computer.
Exceeds 132 steps	Operation error	A rung contains more than 132 steps.
Expansion unit err	Event history	5 Vdc power f the expansion unit is not normal.
ExtDeviceMode function not support	Operation error	The printer driver does not support Landscape mode printing.

Error Message

F...

Message	Type of Error	Description
File access error	Operation error	An error occurred during accessing the file.
File access error	Operation error	File access error occurred during accessing comment file.
File append impossible	Operation error	File append is not possible.
File name not exist	Operation error	The specified file was not found.
File open error	Operation error	The file specified could not be opened.
File read error	Operation error	The file read error has occurred.
File Save Error	Operation error	An error occurred in writing to the file.
File write error	Operation error	The file write error has occurred.
File write error	Operation error	File writing error occurred during accessing comment file.
FileName is Illegal	Operation error	The file name specified is illegal.

I...

Message	Type of Error	Description
I/O bus error	Event history	I/O bus check error occurred. Info 1: Unit No. Info 2: Illegal data Check the expansion cable connection, I/O module mounting condition.
I/O mismatch	Operation error	The specified device/register does not match with the I/O allocation status.
I/O mismatch	Operation error	The operand specified does not match the I/O allocation status.
I/O mismatch	Event history	The I/O allocation information and actual I/O mounting status are not matched. Info 1: Unit No. - slot No. Info 2: Register address Check the I/O allocation information and the I/O module mounting position.

Error Message

Message	Type of Error	Description
I/O no answer	Event history	No answer was acknowledged from the I/O module. Info 1: Unit No. - slot No. Info 2: Register address Check the I/O allocation information and the I/O module mounting position.
I/O parity error	Event history	I/O bus parity error occurred during accessing the I/O module. Info 1: Unit No. - slot No. Info 2: Register address Check the I/O module mounting condition.
IC card BCC error	Event history	BCC error was detected in the user program memory (IC card). Initial load was not executed. Info 1: Illegal BCC data
IC card type error	Event history	The program stored in the IC card is bigger than the PLC memory. Check the IC card.
Illegal file name	Operation error	Illegal file name was specified.
Illegal Filename	Operation error	The file name specified is illegal.
Illegal I/O reg	Event history	XW/YW register address exceeded the limit in allocating I/O modules. Info 1: Unit No. - slot No. Info 2: Register address Check the I/O allocation information.
Illegal inst	Event history	An illegal instruction was detected in the program. Info 1: Program type - block No. Info 2: Offset address in the block Clear memory and reload the program.
Illegal instruction	Operation error	The program cannot be displayed because it contains illegal instruction. (Program abnormal)
Illegal mode	Operation error	The function attempted is not allowed in the current operation mode.
Illegal Parameters	Operation error	Sampling parameters specified are illegal.
Illegal register/device comment file type	Operation error	The format type of the register/device comment file is illegal.
Illegal sys intrpt	Event history	Illegal system interrupt was detected. Info 1: Interrupt address 1 Info 2: Interrupt address 2 Check external noise environment.

Error Message

Message	Type of Error	Description
Immediate data only in Offline mode	Operation error	Register data setting on the program window is not allowed in off-line mode.
Impossible in the specified block	Operation error	The block divide operation specified will cause memory capacity over.
In and Out of the instruction are shorted	Compile error	The input and output of an instruction are shorted.
In/Out Method Error	Operation error	Global setting is not allowed for F10 assignment.
Incorrect connection	Compile error	The combination of the line connectors is not correct.
Incorrect cursor position	Operation error	The current cursor position is illegal to execute the operation specified.
Incorrect End position	Compile error	In the SFC program, position of the SFC End is not correct.
Incorrect Macro End position	Compile error	The position of the SFC Macro End is not correct.
Incorrect range specification	Operation error	The range specified is not correct.
Incorrect register/device specification	Operation error	The register/device specified is not correct.
Incorrect search target specification	Operation error	The search target specified is not correct.
Incorrect target	Operation error	The register address range specified is not correct.
Incorrect target specification	Operation error	The range specified is not correct.
Index/digit option is added to the operand	Operation error	Data setting was attempted to an operand with index modification/digit designation.
Initial and End steps combination error	Compile error	In the SFC program, combination of Initial step and End step is not correct.
Input error	Operation error	The instruction cannot be placed on the specified position.
Insufficient comment area	Operation error	The comment memory is full.
Insufficient comment area in workfile	Operation error	The comment memory allocated in the PLC is full.

Error Message

Message	Type of Error	Description
Insufficient disk capacity	Operation error	The disk capacity is not sufficient.
Insufficient disk capacity	Operation error	Disk full is detected during accessing comment file.
Insufficient Memory	Operation error	Memory allocated is not sufficient to execute.
Insufficient memory capacity	Operation error	Memory allocated is not sufficient to execute.
Invalid block No.	Operation error	The required block number is out of the allowable range.
Invalid combination	Operation error	The combination of I/O type and size is invalid.
Invalid cursor position	Operation error	The current cursor position is illegal to execute the operation specified.
Invalid data	Operation error	The data specified is not valid.
Invalid data range	Operation error	The data value range specified is not correct.
Invalid digit specification	Operation error	The digit specification exceeds the allowable data size for the instruction.
Invalid entry	Operation error	The value set is invalid.
Invalid for SFC block	Operation error	The function required is not allowed in the SFC block.
Invalid format specification	Operation error	The data format specified is not allowed for the operand.
Invalid Fun inst	Event history	Unavailable function instruction for the PLC is programmed. Info 1: Program type - block No. Info 2: Offset address in the block Info 3: Function No. Check the program.
Invalid function in online mode	Operation error	The function required is invalid in on-line mode.
Invalid function No.	Operation error	The function number specified is not valid.
Invalid I/O intrpt	Event history	Unused I/O interrupt signal was detected. Info 1: Unit No. - slot No. Allocate the interrupt module correctly. Check external noise environment.
Invalid in constant scan mode	Operation error	The Subprogram execution time assignment is invalid if Constant scan mode is selected.

Error Message

Message	Type of Error	Description
Invalid in offline mode	Operation error	The function is not available in off-line mode.
Invalid instruction in detail part	Compile error	In the SFC transition condition or action part, unavailable instruction is programmed.
Invalid location	Operation error	The current cursor position is not allowed for the I/O type specified.
Invalid operand	Operation error	The operand specified is not valid.
Invalid operand	Operation error Compile error	The operand specified for the instruction is not valid.
Invalid operation	Operation error	The cursor position is not correct for the operation specified.
Invalid output range specification	Operation error	The output range specified is invalid.
Invalid program	Event history	Program management information is not normal. SUBR instruction is not programmed before RET instruction. END instruction is programmed in the interrupt program. IRET instruction is programmed in other than the interrupt program. SFC is programmed in other than the main or subprogram. Unavailable instruction for the PLC is used. Info 1: Program type - block No. Check the program.
Invalid register/device in offline mode	Operation error	The register/device specified is invalid in off-line mode.
Invalid Rung No.	Operation error	The required rung number is out of the allowable range.
Invalid sampling range	Operation error	The sampling range specified is not correct.
Invalid SFC Prog	Event history	The correspondence between initial step and end step, or the macro entry and macro end is not correct. Info 1: Program type - block No. Check the program.
iomodule.sys file format error	Operation error	The format of the I/O module type file (iomodule.sys) is not correct.
IP Address no entry	Operation error	The IP address for Ethernet is not entered.

Error Message

Message	Type of Error	Description
IP Address or Port No no entry	Operation error	IP address or Port number for Ethernet connection was not entered.

J...

Message	Type of Error	Description
Joint connection error	Operation error	The program cannot be displayed because it contains illegal joint connection. (Program abnormal)
Jump target error	Event history	LBL instruction corresponding to the JUMP instruction is not programmed, or it is on the incorrect location. Info 1: Program type - block No. Info 2: Offset address in the block Info 3: Jump label No. Check the program.

L...

Message	Type of Error	Description
Last block cannot divided	Operation error	The last block (block 256) cannot be divided.
Last block cannot specified	Operation error	The last block (block 256) cannot be divided.
Latch Condition Data Error	Operation error	The data for latch condition is illegal.
Latch target No. x is Illegal	Operation error	The latch target specified on No. x is illegal.
LBL/SUBR is not connected to left bus	Compile error	No other instruction is allowed in the rung of LBL or SUBR instruction.
Limit over	Operation error	The value set is out of the range specified.
Line Clear Error	Operation error	The current cursor position is illegal to execute the line clear operation.
Line Delete Error	Operation error	The current cursor position is illegal to execute the line delete operation.
Line Insert Error	Operation error	The current cursor position is illegal to execute the line insert operation.
Line over	Operation error	The program cannot be displayed because it contains excess lines. (Program abnormal)

Error Message

Message	Type of Error	Description
Loop nesting error	Event history	The nesting level of FOR-NEXT loops exceeds the limit specified. Info 1: Program type - block No. Info 2: Offset address in the block Check the program.
LP exec timeout	Event history	The execution of the language processor (LP) did not finish within the time specified, or scan time exceeded the time specified. Reduce the scan time or use WDT instruction.
LP function error	Event history	An error was detected during the language processor (LP) function check. Info 1: Error code Info 2: Error data Turn off power and on again.
LP reg R/W error	Event history	An error was detected in the initial read/write check for the language processor (LP). Info 1: Error code Info 2: Error data Turn off power and on again.
LP start chk error	Event history	The language processor (LP) could not be started normally.

M...

Message	Type of Error	Description
Meaningless specification	Operation error	The erase range specified has no meaning.
Memory capacity not compatible	Operation error	The memory capacity is not matched.
Memory full	Operation error	The program memory is full.
Memory protect	Operation error	The writing operation is prohibited by P-RUN.
Merging block mismatch	Operation error	Ladder and SFC blocks cannot be merged.
Mode mismatch	Operation error	The current PLC operation mode does not allow to execute the required function.
Mode mismatch	Operation error	Sampling parameters can be set into the PLC when the PLC is HALT or sampling is disabled.
Move destination is invalid	Operation error	Same block is specified for move source and destination.

N...

Message	Type of Error	Description
Next block exists	Operation error	Block divide operation is not allowed because the next block exists.
No address specified	Operation error	The register address range specified is not correct.
No buffering comment data	Operation error	Rung comment paste operation is not possible because the buffer is empty.
No comment registered	Operation error	No comment is registered.
No Data Latched	Operation error	No data has been latched.
No device setting	Operation error	In the bit pattern check function, the device setting is not correct.
No EEPROM	Operation error	EEPROM write was not executed because no EEPROM is mounted.
No empty block	Operation error	Copy or move is not possible because there is no empty block.
No END/IRET error	Event history	END instruction is missing in the main or subprogram, or IRET instruction is missing in the interrupt program. Info 1: Program type - block No. Info 2: Offset address in the block Check the program.
No entry	Operation error	A required entry item was not made.
No entry block	Operation error	Block operation is not possible because there is no programmed block in the program type. There is no programmed block in the erase range specified.
No entry range	Operation error	The range has not been specified.
No mark information	Operation error	The mark ID specified has not been registered.
No merging block	Operation error	The next block to be merged does not exist.
No operand	Operation error Compile error	Necessary operand has not been entered.
No parameter file	Operation error	The parameter file was not found.

Error Message

Message	Type of Error	Description
No pattern setting	Operation error	In the bit pattern check function, the on/off pattern setting is not correct.
No print out item	Operation error	The print item has not been specified.
No program in any specified blocks	Operation error	There is no program in the blocks specified.
No program in the compile range	Compile error	Empty rung cannot be compiled. Use rung delete function.
No program monitored	Operation error	Program is not monitored.
No range specified	Operation error	The range has not been specified.
No register setting	Operation error	In the data validity check function, the register setting is not correct.
No RET error	Event history	RET instruction is not programmed in the subroutine. Info 1: Program type - block No. Info 2: Offset address in the block Info 3: Subroutine No. Check the program.
No Sampling Buffer	Operation error	No sampling buffer is allocated.
No sampling data	Operation error	There is no sampling data in the buffer to be displayed.
No SFC jump label	Event history	SFC label corresponding to the SFC jump is not programmed. Info 1: Program type - block No. Info 2: SFC label No. Check the program.
No SFC macro entry	Event history	Macro program corresponding to the macro step is not programmed. Info 1: Program type - block No. Info 2: Macro No. Check the program.
No sub-r entry	Event history	SUBR instruction corresponding to the CALL instruction is not programmed. Info 1: Program type - block No. Info 2: Offset address in the block Info 3: Subroutine No. Check the program.
No support device	Operation error	The device specified is not supported.

Error Message

Message	Type of Error	Description
Not a WinSock error	Operation error	The specified target could not be confirmed.
Not Support	Operation error	The function specified is not supported.
Not support device	Operation error	The device specified is not supported.
Not support yet	Operation error	The function required is not supported.
Number of SFC steps exceeds the limit	Compile error	In the SFC block, the number of SFC steps exceeds the limit (128).

O...

Message	Type of Error	Description
One device at a time for T. and C.	Operation error	For timer device (T.) or counter device (C.), only one device can be specified at a time.
Open circuit	Compile error	A line is not complete between the instructions.
Operand error	Operation error	The device/register specified is illegal.
Operand error	Event history	Input device/register is used for output. Unavailable device/register for the PLC is used. Timer or counter is duplicated. Unavailable subroutine number for the PLC is used. Unavailable operand modification for the PLC is used. Info 1: Program type - block No. Info 2: Offset address in the block Check the program.
Operand range mismatch	Operation error	The replace address exceeds the limit in the search & replace function.
Operand range over	Operation error Compile error	The operand specified is out of the allowable data range or register/device address range.
Operand type error	Operation error	The operand types are not matched in the search & replace function.
Out of address range	Operation error	The register address is out of the range specified.
Out of input range	Operation error	The value set is out of the range specified.
Out of Position	Operation error	The current cursor position is illegal to execute the operation specified.

Error Message

Message	Type of Error	Description
Out of range	Operation error	The value set is out of the range specified.
Out of value range	Operation error	The value set is out of the allowable data range.

P...

Message	Type of Error	Description
Pair inst error	Event history	Program error was detected for MCS/MCR or JCS/JCR combination. Info 1: Program type - block No. Info 2: Offset address in the block Check the program.
Parameter error	Operation error	Comment file parameter error is detected.
Parameter file error	Operation error	The contents of the parameter file are not correct.
Password mismatch	Operation error	The password entered is not matched.
Password protect	Operation error	The operation was rejected by the PLC due to password protection.
Peripheral LSI err	Event history	An error was detected in peripheral LSI checking. Info 1: Error code Turn off power and on again.
PLC communication error	Operation error	Communication error between T-PDS and PLC has occurred.
Port No no entry	Operation error	The Port number for Ethernet is not entered.
Position error	Operation error	The current cursor position is illegal to execute the operation specified.
Position of LBL/SUBR is not correct	Compile error	No other instruction is allowed in the rung of LBL or SUBR instruction.
Position of RET/IRET is not correct	Compile error	Position of RET or IRET instruction is not correct.
Power interrupt	Event history	Power interruption is detected. (T3/T3H only)
Power intr resumed	Event history	Power interruption has been recovered. (T3/T3H only)

Error Message

Message	Type of Error	Description
Program abnormal	Operation error	Program management information is not normal. SUBR instruction is not programmed before RET instruction. END instruction is programmed in the interrupt program. IRET instruction is programmed in other than the interrupt program. SFC is programmed in other than the main or subprogram.
Program BCC error	Event history	BCC error was detected in the user program memory (RAM). Info 1: Illegal BCC data Check the program. If it looks normal, save it into a disk file, and remake BCC by Block edit function.
Program error detected (stopped)	Operation error	An error is detected in the program. Therefore the operation is stopped.
Program is empty	Operation error	The function specified cannot be executed because the program is empty.
Program loaded	Operation error	The initial load (from EEPROM/IC card to RAM) was executed, or program was loaded through other communication port.
Program type of merging block mismatch	Operation error	Ladder and SFC blocks cannot be merged.
ProgramComment character size error	Operation error	Length of System Comment is up to 30 characters.
ProgramID character size error	Operation error	Length of Program ID is up to 10 characters.

Error Message

R...

Message	Type of Error	Description
RAM check error	Event history	Read/write error was detected in the user data memory (RAM). Info 1: Error address Info 2: Error data Info 3: Test data Turn off power and on again.
Range error	Operation error	The range specified is not correct.
Range over	Operation error	The value set is out of the range specified.
Reg No./size error	Operation error	The required register is out of the allowable range. Register type - bit position, register address
Register/Device No. is Illegal	Operation error	The register/device specified for latch condition is illegal.
Reverse signal flow	Compile error	Power flow from right to left is not allowed.
RUN mode - cannot execute	Operation error	The operation cannot be executed because the PLC is RUN.

S...

Message	Type of Error	Description
Same target name entry	Operation error	The target name is duplicated.
Sampling buffer Allocation error	Operation error	Sampling buffer could not be allocated correctly.
Sampling status is Disable	Operation error	Sampling trace is disabled.
Scan time over	Event history	Scan time exceeded the time specified. Info 1: Scan time Reduce the scan time or use WDT instruction.
Set Data is Illegal	Operation error	The data set for latch condition is illegal.
SFC jump label err	Event history	The SFC label is duplicated. Info 1: Program type - block No. Info 2: SFC label No. Check the program.
SFC Jump/Label connection error	Compile error	In the SFC program, combination of SFC Jump and Label is not correct.

Error Message

Message	Type of Error	Description
SFC macro No. err	Event history	Macro No. is duplicated, or the same macro No. is called from two or more locations. Info 1: Program type - block No. Info 2: Macro No. Check the program.
SFC step No. err	Event history	Step No. is duplicated, or step No. is not matched between Initial and End steps. Info 1: Program type - block No. Info 2: Step No. Check the program.
Short circuit	Compile error	In the SFC program, no step or transition is programmed between divergence and convergence.
Size error	Operation error	The value set is out of the range specified.
SLATCH.EXE running	Operation error	The status latch function has already activated.
SMPTRACE.EXE running	Operation error	The sampling trace function has already activated.
Specified file has already be used as user comment file	Operation error	The file specified is currently used as comment file.
Specified name not registered	Operation error	The name (tag) is not registered.
Specified tag not registered	Operation error	The tag specified has not been registered.
Step connection error	Compile error	In the SFC program, step connection is not correct.
Step no. error	Operation error	The step number is not correct.
Steps connected	Compile error	In the SFC program, no transition is programmed between steps.
Sub-r nesting err	Event history	The nesting level of subroutines exceeds the limit specified. Info 1: Program type - block No. Info 2: Offset address in the block Info 3: Subroutine No. Check the program.
Sys RAM check err	Event history	Read/write error was detected in the system memory (RAM). Info 1: Error address Info 2: Error data Info 3: Test data Turn off power and on again.

Error Message

Message	Type of Error	Description
Sys ROM BCC error	Event history	BCC error was detected in the system memory (ROM). Info 1: Illegal BCC data Turn off power and on again.
System power off	Event history	PLC power is turned off. (no error)
System power on	Event history	PLC power is turned on. (no error)

T...

Message	Type of Error	Description
Tag character size error	Operation error	Tag character size exceeds the limit.
Tag not registered	Operation error	The tag specified has not been registered.
Target name no entry	Operation error	The target name for Ethernet is not entered.
Target not found	Operation error	The search target was not found.
The rung that contains more than 132 steps detected	Operation error	The rung contains excess program steps. The maximum size of a rung is 132 steps.
This file is not T-PDS project file	Operation error	The file specified is not a T-PDS project file.
Timeout offset no entry	Operation error	The time-out offset for Ethernet is not entered.
Top Register Limit over	Operation error	The unit base address specified is out of the allowable range.
Top register/device is out of range	Operation error	The register/device address specified is out of the allowable range.
Top rung of block cannot divide	Operation error	The top rung of the block cannot be specified for the block divide operation.
Top rung of block cannot specified	Operation error	The top rung of the block cannot be specified for the block divide operation.
Total program steps of this block exceeds the limit	Compile error	Number of steps in the SFC block exceeds 1021 steps.
Transition connection error	Compile error	In the SFC program, transition connection is not correct.
Transitions connected	Compile error	In the SFC program, no step is programmed between transitions.

U...

Message	Type of Error	Description
Unable to allocate *** memory	Operation error	*** could not be allocated to the memory.
Unable to Execute for BLOCKEDI.EXE	Operation error	The edit block function could not be started.
Unable to execute for SLATCH.EXE	Operation error	The status latch function could not be started.
Unable to execute for SMPTRACE.EXE	Operation error	The sampling trace function could not be started.
Unable to get file information	Operation error	The file information could not be read.
Unavailable in this block	Compile error	The instruction is not allowed in this block.

V...

Message	Type of Error	Description
Vertical connection impossible	Operation error	Vertical connection cannot be entered on the specified position.

W...

Message	Type of Error	Description
WD timer error	Event history	Watchdog timer error occurred. Info 1: Address 1 Info 2: Address 2 Check external noise environment.
Write protect error	Operation error	The drive specified is write protect state.

X...

Message	Type of Error	Description
XY Register Size Limit error	Operation error	The registers allocated to I/O types X, Y and X+Y exceed the address limit.

Z...

Message	Type of Error	Description
Z Register Size Limit error	Operation error	The registers allocated to I/O type Z exceed the address limit.

TOSHIBA

TOSHIBA CORPORATION
Industrial Equipment Department
1-1, Shibaura 1-chome, Minato-ku
Tokyo 105-8001, JAPAN
Tel: 03-3457-4900 Fax: 03-5444-9268