
GENERAL-PURPOSE PROGRAMMABLE CONTROLLER
PROSEC EX SERIES

Data Access Panel
(DP100)

USER'S MANUAL

February 1987

TOSHIBA CORPORATION

This manual describes the general specifications, operating procedures, and precautions for the EX Series Data Access Panel (DP100).

Please read it carefully to become familiar with procedures for correctly using your DP100. Readers should also refer to the following related publications available from Toshiba Corporation:

- o EX250/500 Mainframe Instruction Manual
- o EX250/500/200B Programming Instructions
- o EX200B Mainframe Instruction Manual

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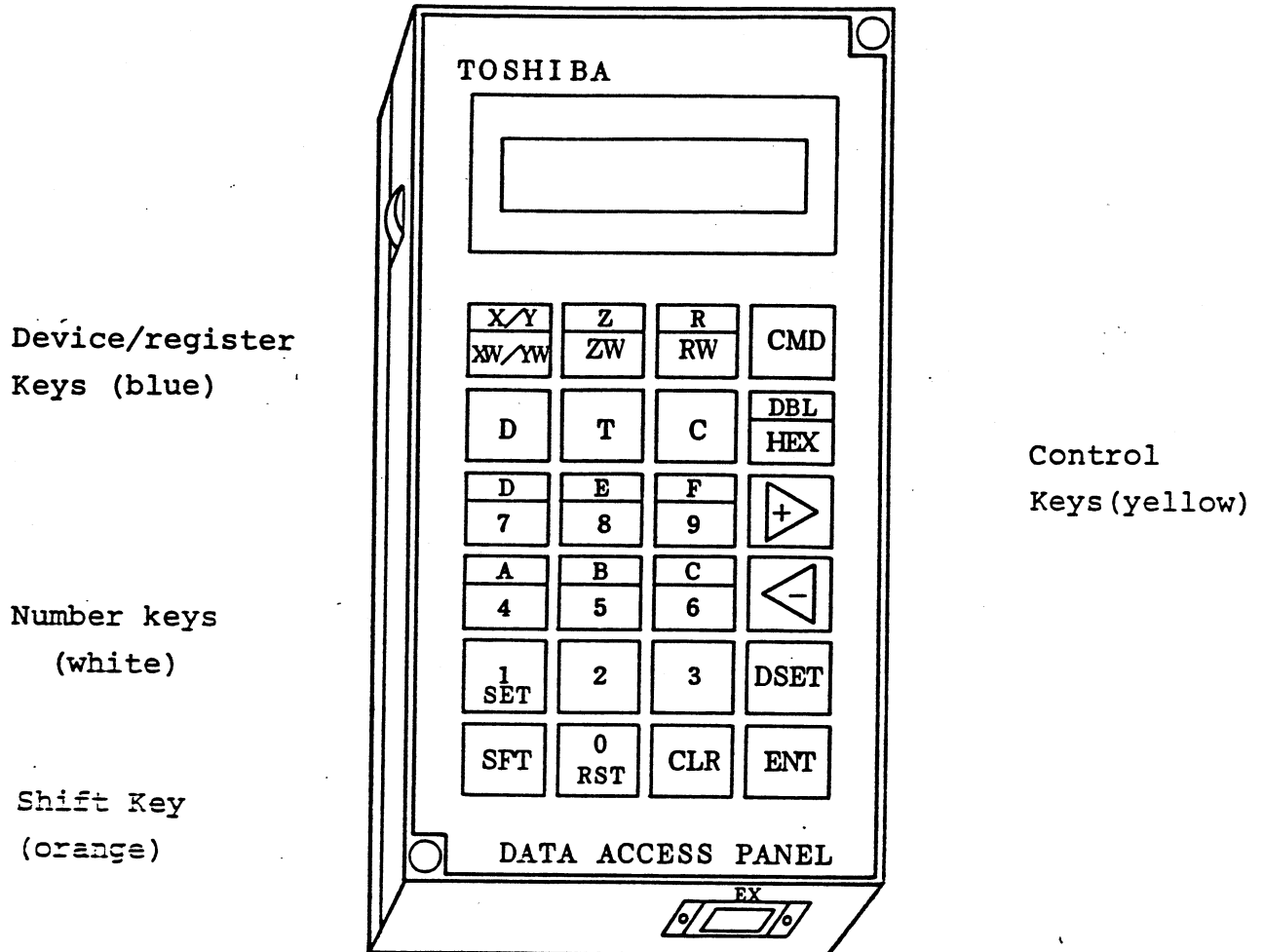
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1-1 DP100 and its Functions



Device/register
Keys (blue)

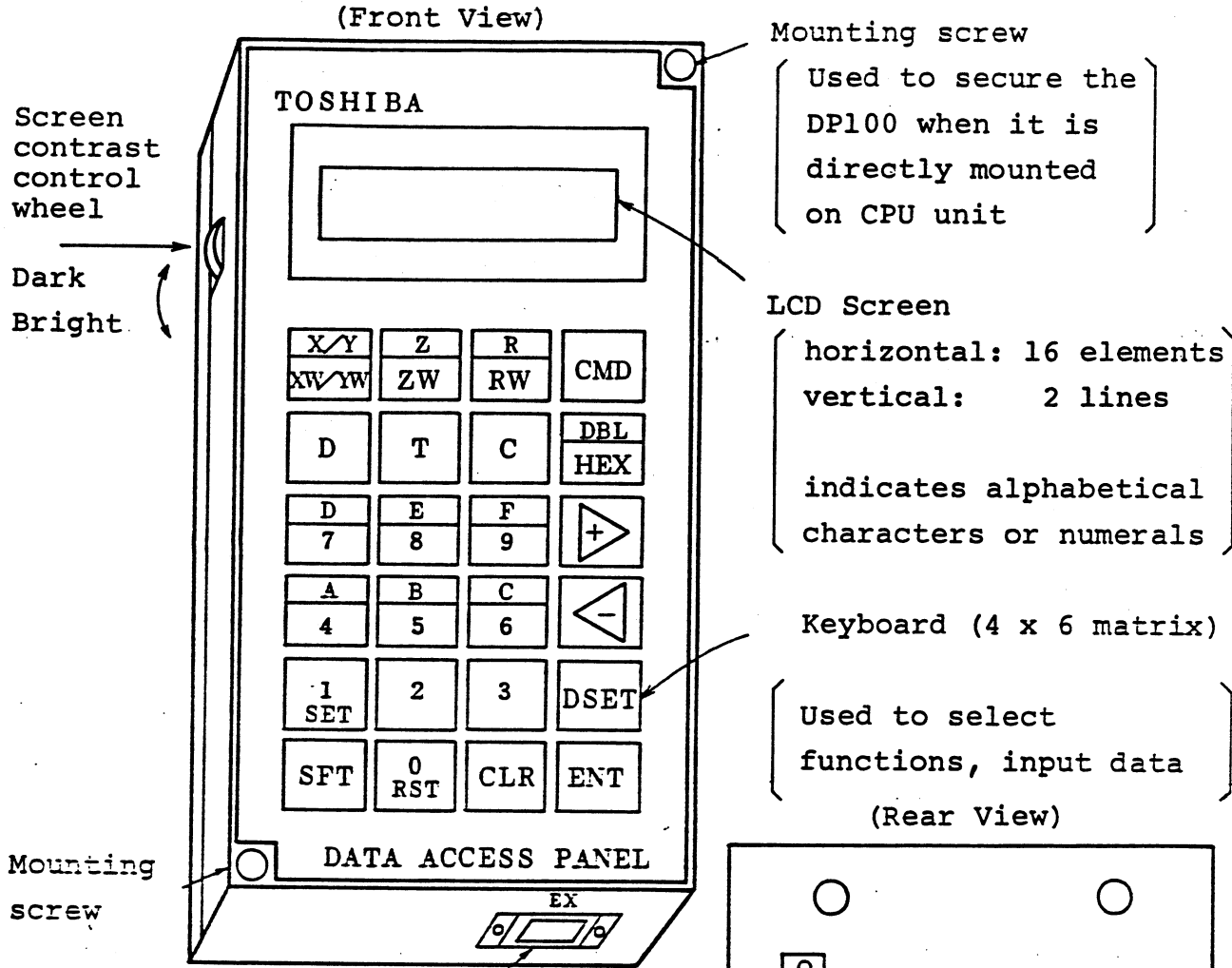
Number keys
(white)

Shift Key
(orange)

Control
Keys (yellow)

- o The DP100 Data Access Panel can be used with the EX250, EX500, and EX200B programmable controllers (PC).
- o The DP100 is a data read/write device. It cannot be used for programming the PC or error recovery procedures. Use programming units dedicated for these functions when required.
- o By connecting the DP100 to the PC's central processing unit (CPU Unit), the following functions are available:
 - (1) Indication of PC status, error message display (command functions)
 - (2) Register read/write (register access function)
 - (3) Double-length register read/write (double-length register access function)
 - (4) Timer/counter preset value read/write (timer/counter access function)
 - (5) Device read/write (device access function)

1-2 Components of DP100

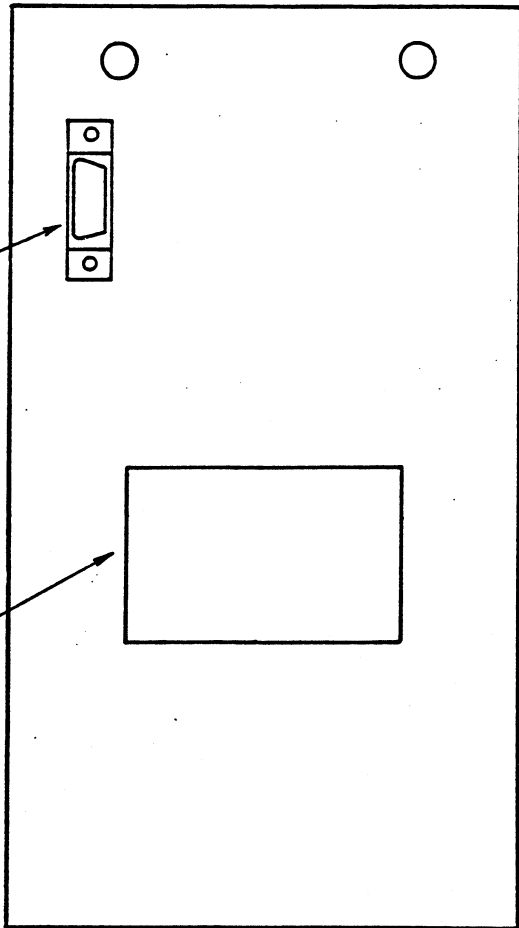


Mounting screw
 (Used to secure the DP100 when it is directly mounted on CPU unit)

LCD Screen
 (horizontal: 16 elements
 vertical: 2 lines
 indicates alphabetical characters or numerals)

Keyboard (4 x 6 matrix)
 (Used to select functions, input data)

(Rear View)



Cable outlet to connect DP100 and PC

Outlet for joining the DP100 to CPU unit

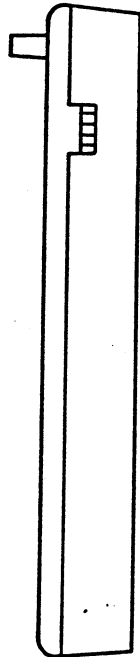
Unit identification plate type and serial number inscribed

EX SERIES
 DATA ACCESS PANEL
 TYPE **DP100**
 SER. NO. _____
 TOSHIBA CORPORATION
 TOKYO JAPAN

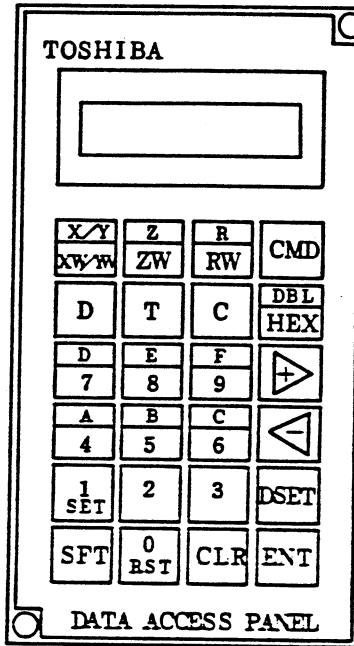
2-1 Unpacking Procedures

(1) Equipment Confirmation

Verify that the equipment received complies with the equipment ordered.



(Side view)



(Front view)

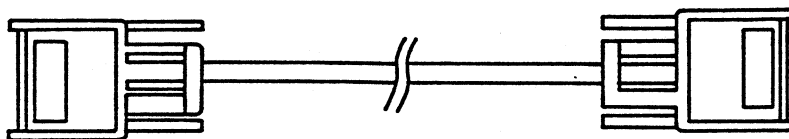


(Bottom view)

(2) Confirmation of accessories

Check that the following accessories have been shipped with the DP100:

1. One DP100 user's manual
2. One 2 meter (6.6ft) connecting cable
(See diagram below)

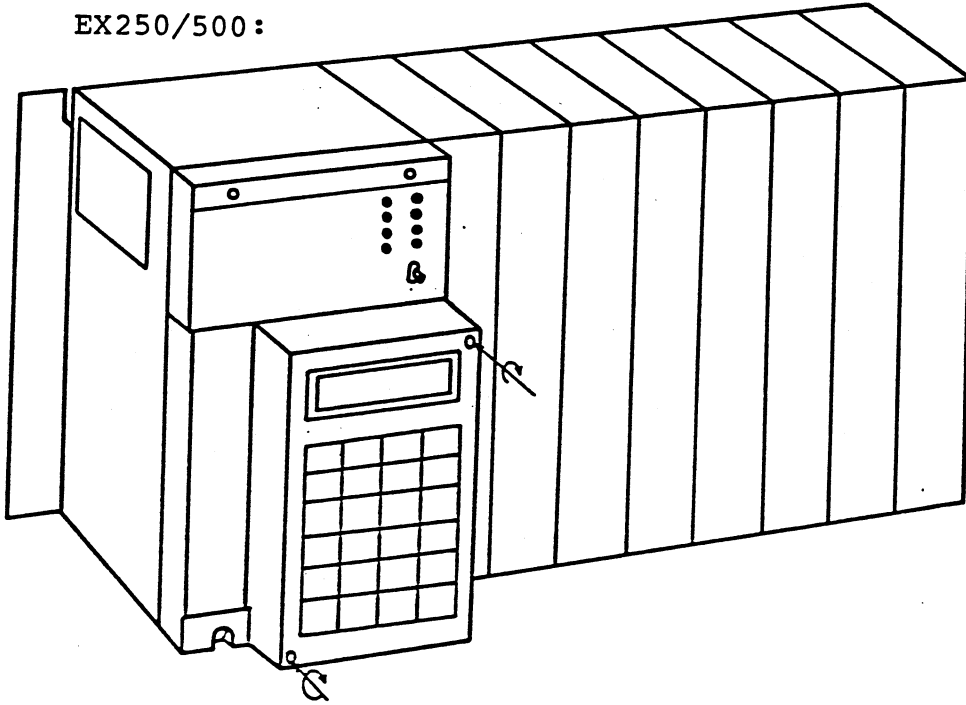


Cable connecting DP100 and PC

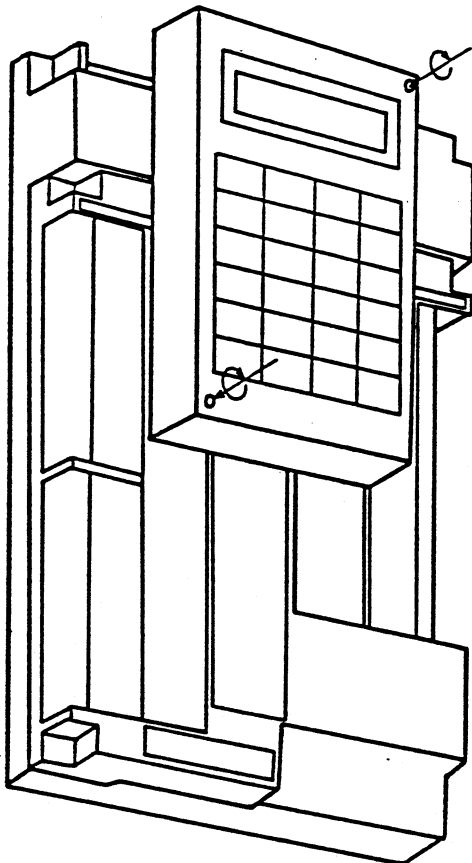
2-2 Installing the DP100

(1) Direct mounting on the PC

EX250/500:



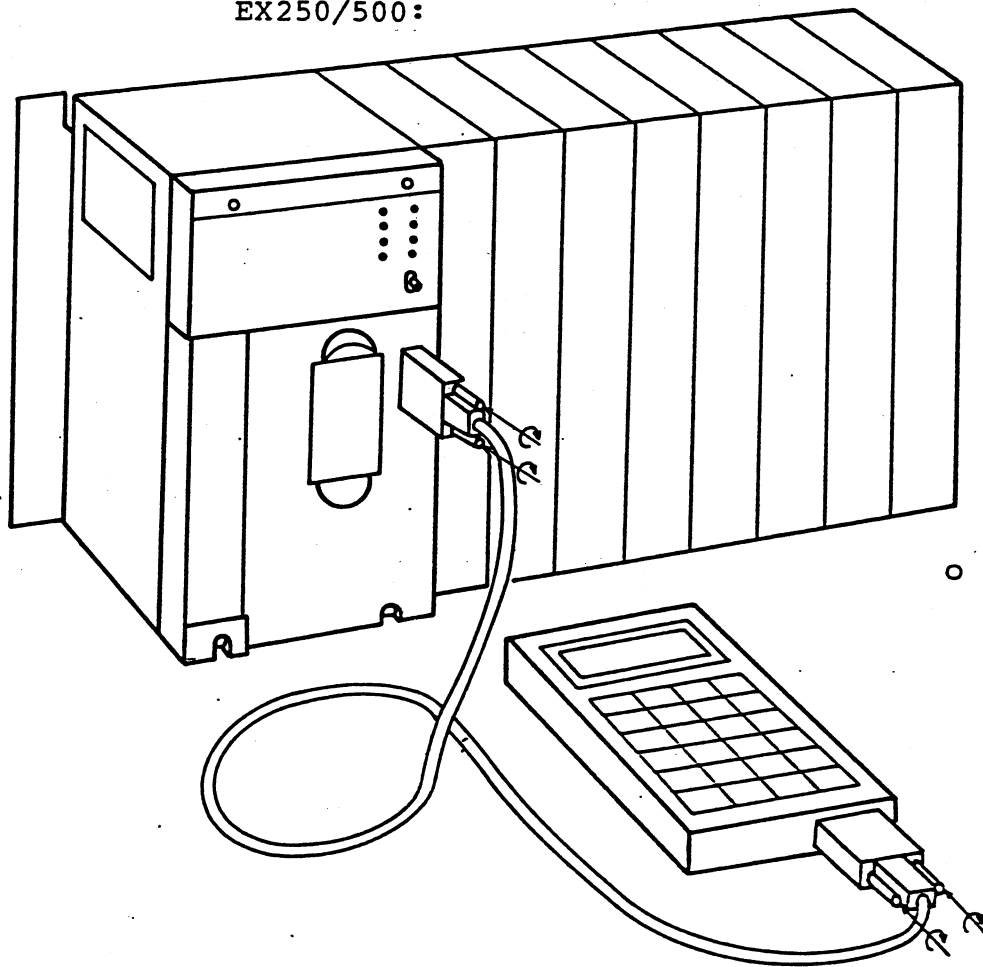
EX200B:



- o Tighten the two mounting screws at the upper right and lower left corners.

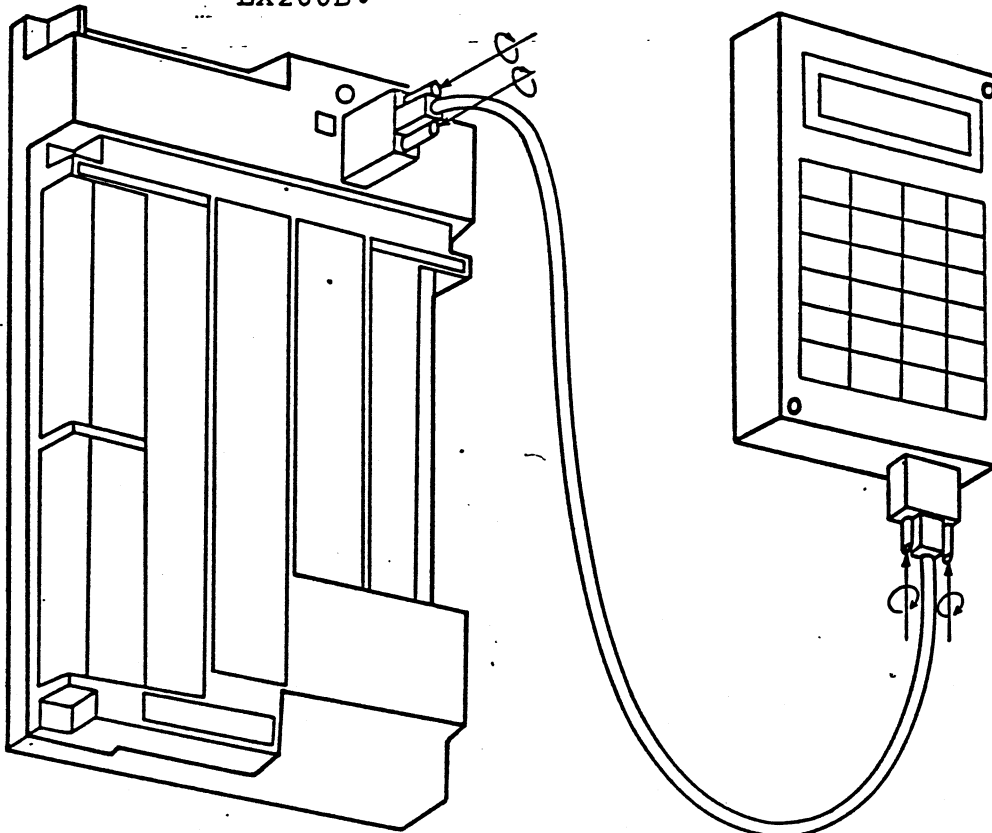
(2) Connecting the DP100 to the PC by cable

EX250/500:



- o Tighten the four connector screws at both ends of the transmission cable.

EX200B:



- o Optional: Mounting brackets are available to attach the DP100 to the controller panel.

2-3 System Check

Use the following procedure to check system operational status.

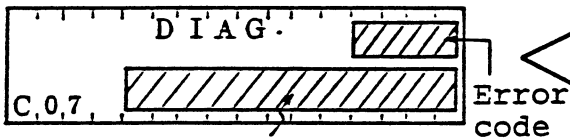
Check "COMM" LED

When the power switch is turned on after connecting the DP100 to the CPU unit, the "COMM" LED enters the following states:

- (1) Immediately after power switch is turned on: OFF ○
- (2) After two or three seconds: Blinks ⚡

Check the initial screen

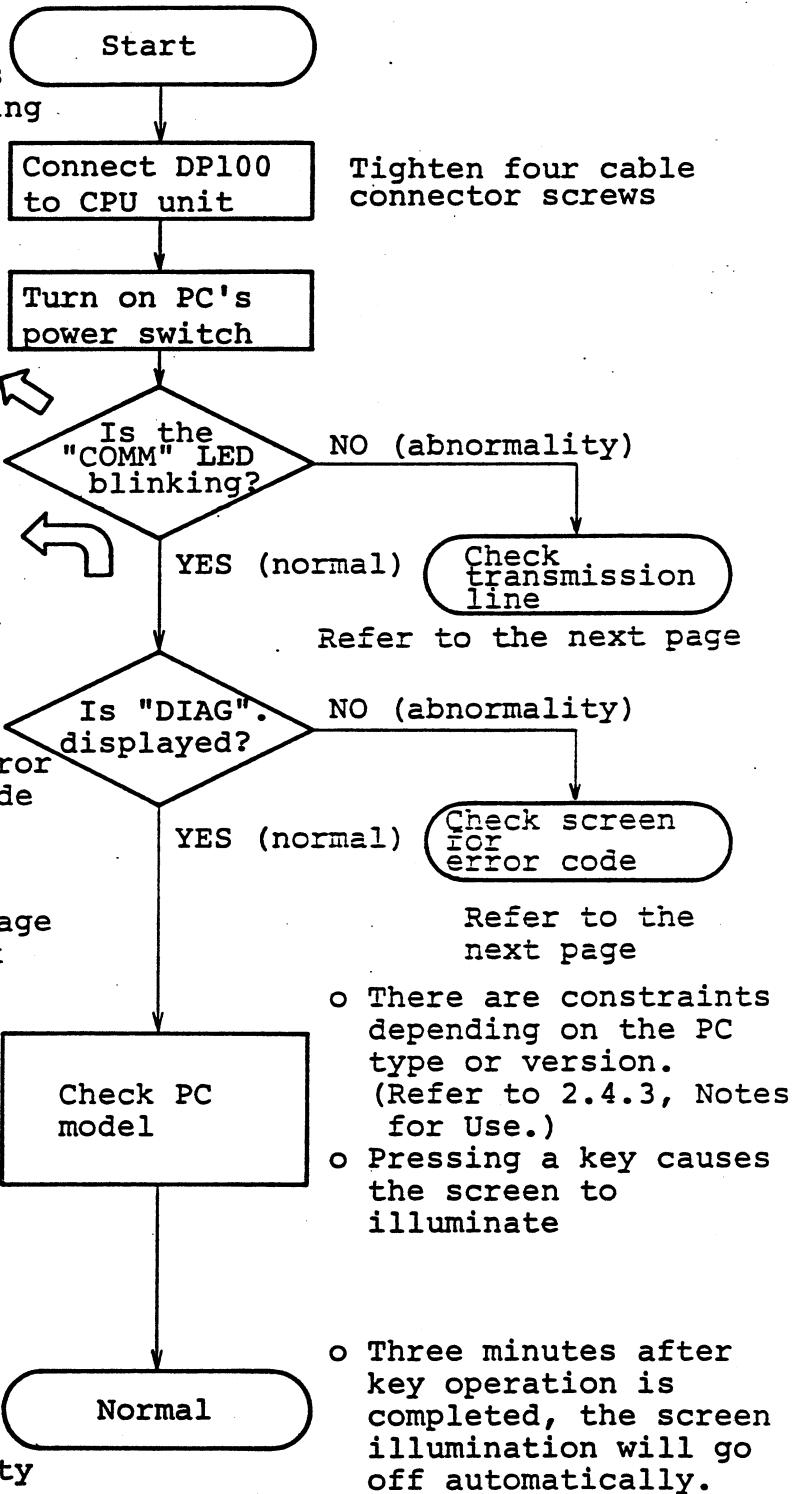
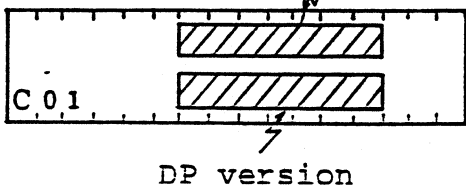
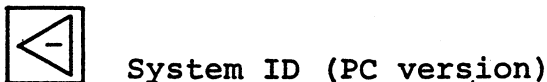
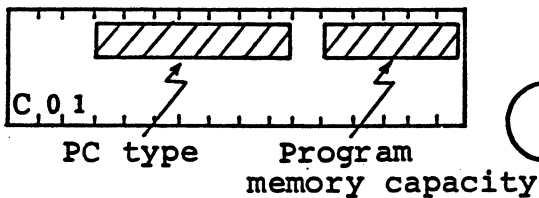
After the power switch is turned on, cyclic diagnostic display (command 07) is executed automatically



Diagnostic display message
If there are no errors, the error code and diagnostic display message areas will become blank

Verify PC model

Use the following key operation to verify PC model:



Tighten four cable connector screws

Refer to the next page

Refer to the next page

- There are constraints depending on the PC type or version. (Refer to 2.4.3, Notes for Use.)
- Pressing a key causes the screen to illuminate

- Three minutes after key operation is completed, the screen illumination will go off automatically.

Checking the transmission line

When an error occurs in the transmission line, use the following procedure to pinpoint its cause:

1. When DP100 is mounted directly on CPU:
 - (1) Are the two DP mounting screws firmly fastened?
(Refer to 2-2, Installing the DP100.)
 - (2) Is the CPU unit normal? (Is the "CPU" LED of the CPU unit lit?)
 - (3) Is the power switch of the CPU unit ON?
(Is the "Power" LED of the CPU unit lit?)
 - (4) Remove the DP100, re-install it and try system check again..
 - (5) Cycle the power switch off, then on.
Try system check again.

2. When DP100 is connected by cable
 - (1) Are all four cable connector screws firmly fastened?
(Refer to 2-2, Installing the DP100.)
 - (2) Is the CPU unit normal? (Is the "CPU" LED of the CPU unit lit?)
 - (3) Is the power switch of the CPU unit ON? (Is the "POWER" LED of the CPU unit lit?)
 - (4) Are you using the proper cable?
(Do not use cables intended for other programming units because the DP100 has its own special cable.)
 - (5) Remove the cable, re-connect it and try system check again.
 - (6) Remove the cable and directly mount the DP100 to the CPU unit. If the system functions properly, the transmission cable is faulty.

Checking the display

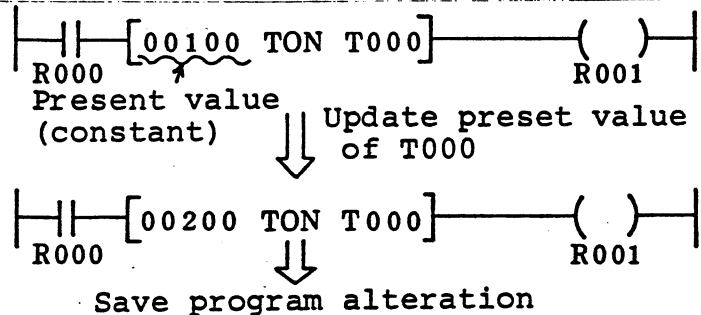
If the initial screen is not displayed, check the display by using the following procedure:

- (1) Is an error message displayed? Correct the error by using a programming device (GP100 or MP100).
- (2) Did you adjust the screen contrast? (Turn the LCD contrast control knob clockwise to make sure the screen has not been inadvertently darkened.
- (3) Do temperatures in the installation environment exceed 40°C (104°F)?
(The screen will darken in high temperatures.)
- (4) Is the "CPU" LED of the PC lit?
- (5) Is the transmission line securely connected at both ends?
- (6) Cycle the power off and on, then check display again.
- (7) Does each key make a slight beeping sound when pressed?
If so, the DP100 is operating normally; check the contrast adjustment again.)
- (8) Does the DP100 check out properly when other programming units are used?
(Check by connecting other programming units.)

2-4 Notes for Use

1. Updating preset constant values

Updating the preset timer/counter value (a constant) is a program modification, therefore, the modified version must be "saved" to the cassette tape etc.



2. ROM operation

When the PC is operated by ROM, the timer/counter preset value cannot be altered. If an updating of this constant is attempted, the following error message will be displayed.

!ERR (PROM)

If the timer/counter value must be altered, it is recommended that you specify the preset value as the register stored at power failure.

3. Constraints on PC

The following constraints are in effect, depending on the PC type and version being used:

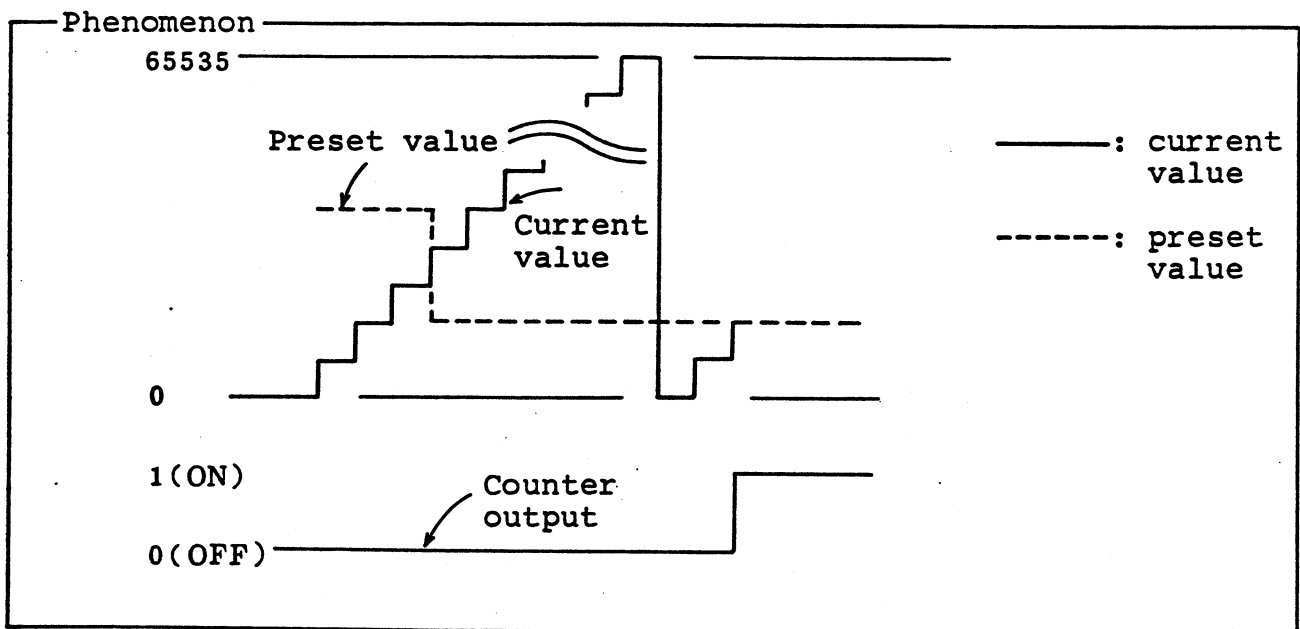
Model name	Version	Updating the timer/counter preset value
EX250 EX500 EX200B	V1.* V1.* V1.*	(1) When the preset value is in the range of 0 through 255, updating is restricted to values within the same range. (2) When the preset value is in the range of 256 through 65535, updating of the preset value is inhibited.
EX250 EX500 EX200B	Versions after V2.0 Versions after V2.0 Versions after V2.0	(1) The preset value can be updated as necessary. Note: 1. When the preset value range is changed from 0 through 255 to 256 through 65535, one step is added to the program.

Model name	Version	Updating the timer/counter preset value
EX250 EX500 EX200B	Versions after V2.0 Versions after V2.0 Versions after V2.0	<p>2. When the preset value range is changed from 256 through 65535 to 0 through 255, one step is subtracted from the program.</p> <p>(2) To avoid exceeding the program's step limitation, allow extra space in the program memory when updating the preset constant value.</p> <p>The total space to be saved in the program memory should include at least as much space as the number of the constant preset value.</p>

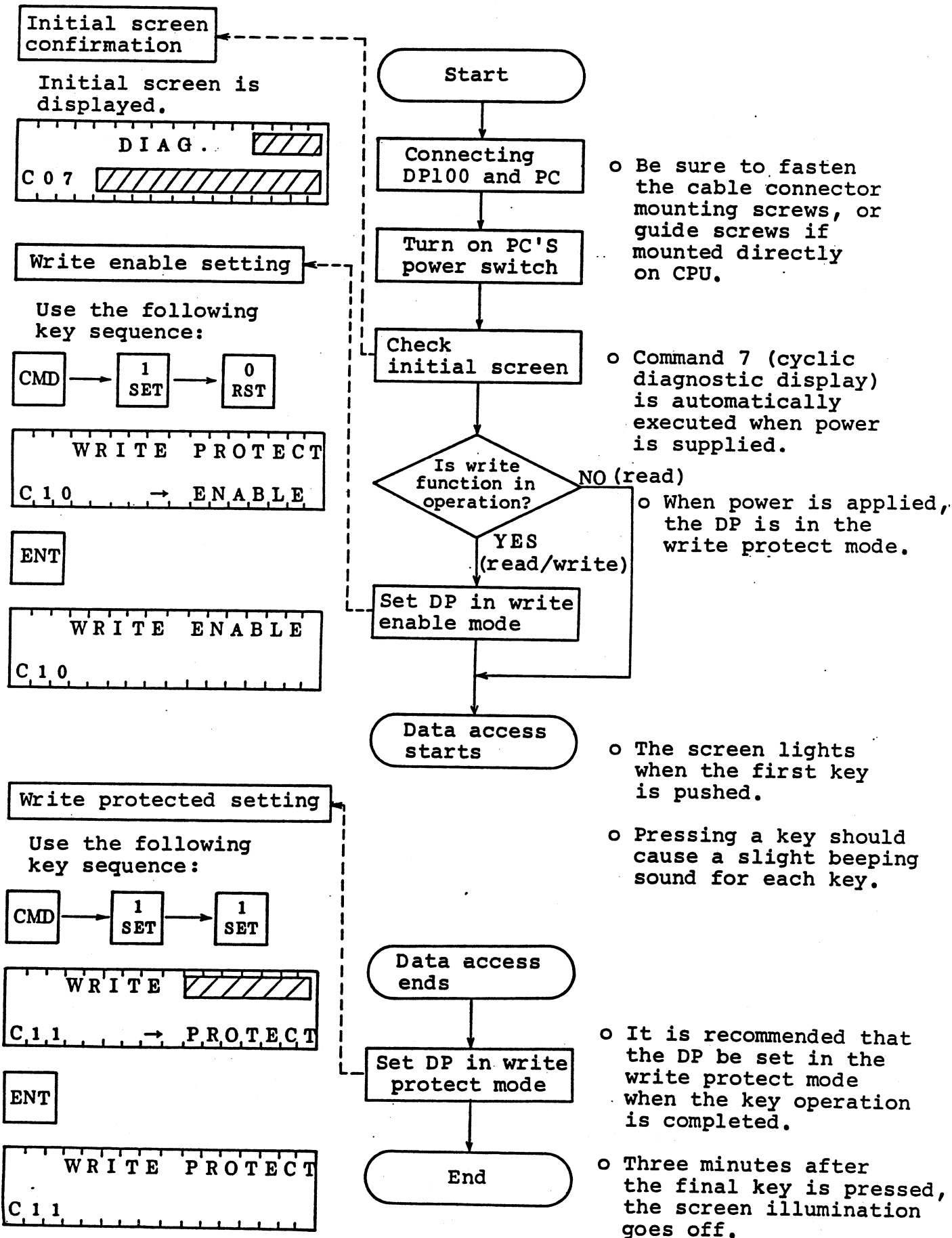
* denotes numeric value.

4. Notes for updating the counter preset value

When the present value is changed to a value smaller than the current value, the program increments the current value until it reaches 65535, when the next count is reset to 0 and incrementing continues. Accordingly, turn off the counter instruction enable input for initialization after updating the preset value.



3-1 Operating Procedures



3-2 Operation Keys, Functions



(1) DP control keys (yellow)

Key	Name	Function
SFT	SHIFT KEY (orange)	Works like typewriter shift key to select between primary and shift functions on dual-function keys.
CLR	CLEAR KEY	Used to clear the entire screen or current numeric values
CMD	COMMAND KEY	Used to enter command number(s)
DBL	DOUBLE-LENGTH KEY	Used to switch to/from double- or single-length
HEX	HEXADECIMAL KEY	Used to switch to/from hexadecimal and decimal display
DSET	DATA SET KEY	Used with numbers to identify data for write operation
ENT	ENTER KEY	Completes data input procedure











(2) Device/register keys (blue)

Key	Name	Function
X/Y	External I/O device key	Used to enter I/O device (X/Y) numbers
XW/YW	External I/O register key	Used to enter I/O register (XW/YW) numbers
Z	Link device key	Used to enter link device (Z) numbers
ZW	Link register key	Used to enter link register (ZW) numbers
R	Auxiliary relay device key	Used to enter auxiliary relay device (R) numbers
RW	Auxiliary relay register key	Used to enter auxiliary relay register (RW) numbers
D	Data register key	Used to enter data register (D) numbers
T	Timer register key	Used to enter timer register (T) numbers
C	Counter register key	Used to enter counter register (C) numbers

(3) Cursor keys (yellow)

Key	Name	Function	
	PLUS CURSOR KEY	Un-shifted	Scrolls display contents forward during read Adds data during write
		Shifted	Switches to the absolute value (decimal) display during read Inputs plus sign (+) during write
	MINUS CURSOR KEY	Un-shifted	Scrolls display contents backward during read Subtracts data during write
		Shifted	Switches to coded decimal display during read Inputs minus sign (-) during write

(4) Number keys (white)

Key	Name	Function
	0 / RESET	Inputs numeric value 0 Resets device during write
	1 / SET	Inputs numeric value 1 Sets device during write
	2	Inputs numeric value 2
	3	Inputs numeric value 3
	A	Inputs numeric value A
	4	Inputs numeric value 4
	B	Inputs numeric value B
	5	Inputs numeric value 5
	C	Inputs numeric value C
	6	Inputs numeric value 6
	D	Inputs numeric value D
	7	Inputs numeric value 7
	E	Inputs numeric value E
	8	Inputs numeric value 8
	F	Inputs numeric value F
	9	Inputs numeric value 9

3-3 Key Sequence for Major Functions

No	Function	Key sequence	Section
1	Command function	Status display (command 00) CMD → ENT	4-1
2		Parameter display CMD → 1 SET → ENT → ▷ → ▷ → ▷ → ▷	4-2
3		Error message display (command 02) CMD → 2 → ENT	4-3
4		Diagnostic display (command 06) CMD → C 6 → ENT → ▷ → ▷ → ▷	4-4
5		Cyclic diagnostic display (command 07) CMD → D 7 → ENT	4-5
6		Write enable setting (command 10) CMD → 1 SET → 0 RST → ENT	4-6
7		Write protect setting (command 11) CMD → 1 SET → 1 SET → ENT	4-7
8	Register access function	Register read [register key] → [register No.] → ENT	5-1
9		Register write (register read) → DSET → [Numeric value] → ENT	5-2
10	Double-length register access function	Double-length register read (register read) → SET DBL HEX	6-1
11		Double-length register write (Double-length register read) → DSET → [Numeric value] → ENT	6-2
12	Timer/counter access function	Timer/counter read [register key] → [register No.] → ENT	7-1
13		Writing the preset Timer/Counter value (Timer/counter read) → DSET → [Numeric value] → ENT	7-2
14	Device access function	Device read [Device key] → [Device NO.] → ENT	8-1
15		Device write (Device read) → DSET → 1 SET or 0 RST → ENT	8-2

**DBL
HEX**

: Switches to decimal or hexadecimal display during register read.
Switches to 1-bit or 16-bit display during device read.

SFT



: Switches to coded decimal display during read.
Inputs a minus sign during write.

SFT



: Switches to decimal display during read.
Inputs a plus sign during write.

4-1 Status display (command 00)

Function: Displays the PC mode and alarm

Key sequence: CMD → ENT

Key operation	Display	Comment
CMD	<pre> PC-STATUS C00 </pre>	o Selects command 00
ENT	<pre> HALT C00 !BATT.FAIL </pre>	o Displays mode and alarm

- o Entering a command number is not required because the command number is reset to 0 when the CMD key is pressed.








Glossary

- ① MODE HALT, RUN, and ERROR modes are provided to indicate the state of the CPU unit.
- HALT: Stops CPU unit
- RUN: CPU unit is under operation.
- ERROR: An error has been detected.
- ② ALARM Warns of abnormal operation. DP does not enter ERROR mode.
- !BATT FAIL: Battery voltage is low.
- !TOSLINE ERR: TOSLINE error
- !LINK ERROR: Computer link error

4-2 Parameter display (command 01)

Function: Displays various information about CPU status.



Key operation	Display	Comment
 	<pre>PARAMETER C01</pre>	o Selects command 01
	<pre>EX250 2.0K C01</pre>	o Displays PC type and program memory capacity
	<pre>ID=0123456789 C01</pre>	o Displays the program ID (is blank when there is no registration)
	<pre>USED PAGE=00000 C01 STEP=00000</pre>	o Displays the number of pages and steps in use.
	<pre>SCAN= 00000mS C01</pre>	o Displays scan time
	<pre>EX-V1.0 C01 DP-V1.0</pre>	o Displays the system ID, DP version.

Glossary

- ① PC TYPE PC's name
- ② PROGRAM MEMORY... CAPACITY Indicates program in memory capacity 1-K step units
- ③ PROGRAM ID Indicates registered name of program (10 characters)
- ④ USED PAGE Indicates the last page number in program
- ⑤ USED STEP Indicates number of steps used
- ⑥ SCAN TIME Indicates the program execution time for initial scan (unit: ms)
- ⑦ SYSTEM ID Indicates PC version number
- ⑧ DP version Indicates the DP version number

4-3 Error Message Display (command 02)

Function: Displays error contents when an error is detected.

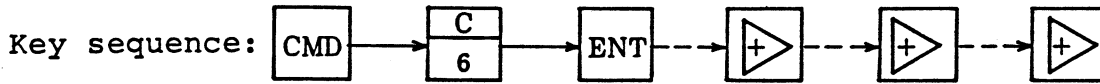
Key sequence: CMD → 2 → ENT



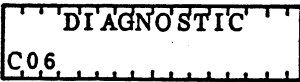



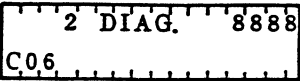

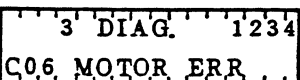

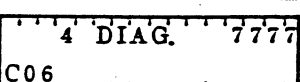
Key operation	Display	Comment
CMD 2	<pre> ERROR-STATUS C02 </pre>	<ul style="list-style-type: none"> o Selects command 02 o Displays the error message
ENT	<pre> SCAN= 01'00'0mS C02 !SCAN OVER </pre>	<ul style="list-style-type: none"> o Displays the error message (This message appears when scantime exceeds limit.)

- o The error message remains on the screen until error table. CLEAR command is executed with programming unit.
- o Details of error messages are given in Appendix 2, Error Messages.

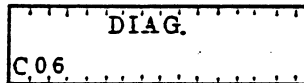
4-4 Diagnostic Display (command 06)

Function: Displays error data following a diagnostic check



Key operation	Display	Comment
 		o Selects command 06
		o Displays error code in upper section, diagnostic display message in lower section
		
		
		

- o If the diagnostic display command is not used, or if an error is not found, the following message is displayed:



- o A maximum of four screens can be displayed for diagnosis. Of these, the first screen indicates the latest data.
- o The display screen cannot be updated automatically.

Glossary	
① Diagnostic display command	Command that registers the error code and message, depending on the error data detected in the program. DDSP (FUN090) and DDSM (FUN091) are provided for diagnostic purposes.
② DDSP	Diagnostic display command. Error code can be registered.
③ DDSM	Diagnostic command with message attached. Both error code and message can be registered.
④ Error code	The error number to be registered by diagnostic display command (DDSP, DDSM).
⑤ Diagnostic display message	Message to be registered by diagnostic display command (DDSM).

4-5 Cyclic Diagnostic Display (command 07)

Function: Displays latest diagnostic data (appears when power is applied).

Key sequence: CMD → D
7 → ENT

Key operation	Display	Comment
CMD D 7	DIAGNOSTIC C07	o Selects command 07
ENT	DIAG. C07	o This is displayed when there is no error message in the CPU unit and no diagnostic error has been detected. The latest diagnostic display data is displayed.
	DIAG. 7777 C07	
	DIAG. 1234 C07 MOTOR ERR	
	DIAG. 8888 C07	
	DIAG. 9999 C07 LIMIT OVER	

- o When there is an error message in the CPU unit, an error is displayed. The error message contents are the same as those for command 02.

4-6 Write Enable Setting (command 10)

Function: Enables data write in the register, device, etc.
 (Data write is disabled when power is applied.)

Key sequence:

CMD

 →

1
SET

0
RST

 →

ENT

Key operation	Display	コ メ ン ト					
<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>CMD</td></tr></table> <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>1</td></tr><tr><td>SET</td></tr></table> <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>0</td></tr><tr><td>RST</td></tr></table>	CMD	1	SET	0	RST	<pre>WRITE PROTECT C10 → ENABLE</pre>	<ul style="list-style-type: none"> ○ The current state is displayed in the upper section, the state after setting is displayed in the lower section. ○ Write enable mode is set.
CMD							
1							
SET							
0							
RST							
<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>ENT</td></tr></table>	ENT	<pre>WRITE ENABLE C10</pre>					
ENT							

4-7 Write Protect Setting (command 11)

Function: Inhibits data write in the register, device, etc.

Key sequence:

CMD

 →

1
SET

1
SET

 →

ENT

Key operation	Display	Comment					
<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>CMD</td></tr></table> <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>1</td></tr><tr><td>SET</td></tr></table> <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>1</td></tr><tr><td>SET</td></tr></table>	CMD	1	SET	1	SET	<pre>WRITE ENABLE C11 → PROTECT</pre>	<ul style="list-style-type: none"> ○ The current state is displayed in the upper section, the state after setting is displayed in the lower section. ○ Write protect mode is set.
CMD							
1							
SET							
1							
SET							
<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>ENT</td></tr></table>	ENT	<pre>WRITE PROTECT C11</pre>					
ENT							

5-1 Register Read

Function: Reads XW, YW, ZW, RW, D registers.

Key sequence: [Register key] → [Register No.] → ENT

Key operation	Display	Comment
<div style="border: 1px solid black; padding: 2px; display: inline-block;">R</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">RW</div> (register key)	RW REG No. = 00,00,0	o Selects register key
<div style="border: 1px solid black; padding: 2px; display: inline-block;">1</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">0</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SET</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">RST</div> (register number)	RW REG No. = 00,0,0,1,0	o Inputs register number
<div style="border: 1px solid black; padding: 2px; display: inline-block;">ENT</div>	RW0010 = 65,53,5	o Indicates register contents

<div style="border: 1px solid black; padding: 2px; display: inline-block;">DBL</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">HEX</div>	RW0010 = HFFFF	o Hexadecimal display
<div style="border: 1px solid black; padding: 2px; display: inline-block;">SFT</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">◀</div>	RW0010 = -00001	o Coded decimal display
<div style="border: 1px solid black; padding: 2px; display: inline-block;">▶</div>	RW0011 = +12,345	o Indicates next register
<div style="border: 1px solid black; padding: 2px; display: inline-block;">◀</div>	RW0010 = -0,0,0,01	o Indicates previous register

DBL

HEX

 key : Used to switch to decimal or hexadecimal display (for register read)

SFT

◀

 key : Sets the coded decimal display (during read)

SFT

▶

 key : Sets the decimal display (during read)

▶

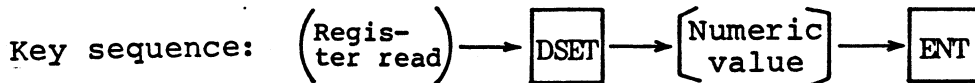
 key : Advances the register number

◀

 key : Resets the register number

5-2 Register Write

Function: Writes data into XW, YW, ZW, RW, and D registers.



Key operation	Display	Comment
R 1 0 ENT RW SET RST (register read) DSET	RW0010 = 00120 RW0010 = 00120 DSET = 00120	○ Reads register Writes decimal data
1 0 SET RST (numeric value) ENT	RW0010 = 00120 DSET = 00010 RW0010 = 00010	○ Inputs data
DRH HEX DSET SFT F 9 (numeric value) ENT	RW0010 = H000A RW0010 = H000A DSET = H000A RW0010 = H000A DSET = H000F RW0010 = H000F	○ Reads register in hexadecimal Writes hexadecimal data ○ Inputs hexadecimal data
SFT ◀ DSET SFT ◀ (sign) 1 0 SET RST (numeric value) ENT	RW0010 = +00015 RW0010 = +00015 DSET = +00015 RW0010 = +00015 DSET = -00015 RW0010 = +00015 DSET = -00010 RW0010 = -00010	○ Reads register in coded decimal Writes coded decimal data ○ Inputs sign

SFT ◀ key: Inputs minus sign (during write)

SFT ▶ key: Inputs plus sign (during write)

Data write is inhibited in write protect mode.

6-1 Double-Length Register Read

Function: Reads XW, YW, ZW, RW, and D registers in double-length

Key sequence: (Register read) → SFT DBL
HEX

Key operation	Display	Comment
D ENT (register read)	D00000 = 65,535	○ Reads register
SFT DBL HEX	D00000 · D00001 = 4294967295	○ Double-length display
DBL HEX	D00000 · D00001 = HFFFFFFF	○ Hexadecimal display
SFT ◀	D00000 · D00001 = -000000001	○ Coded decimal display
▶	D0'0002 · D0'0003 = +000000001	○ Displays next register
◀	D0'0000 · D0'0001 = -000000001	○ Displays previous register

DBL
HEX key : Used to switch to decimal or hexadecimal display (during double-length register read)

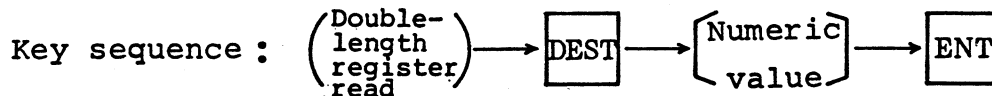
SFT ◀ key : Displays coded decimal (during read)

SFT ▶ key : Displays decimal (during read)

SFT DBL
HEX key : Used to switch to register display or double-length display.

6-2 Double-Length Register Write

Function: Writes double-length data into XW, YW, ZW, RW, and D registers.



Key operation	Display	Comment	
[D] [ENT] [SFT] [DBL/HEX] (double-length register read) [DSET]	D000'00·D000'01 = 4294967295	○ Reads double-length register data ○ Inputs data	
	D000'00·D000'01 DSET= 4294967295		Writes decimal data
	[2] (numeric value)		
	[ENT]		
[DBL/HEX] [DSET]	D000'00·D000'01 = H00000002	○ Reads register in hexadecimal ○ Inputs hexadecimal data	
	D000'00·D000'01 DSET= H00000002		Writes hexadecimal data
	[SFT] [F/9] (numeric value)		
	[ENT]		
[SFT] [◀] [DSET]	D000'00·D000'01 = +000000015	○ Reads register in coded decimal ○ Inputs plus or minus sign for display	
	D000'00·D000'01 DSET= +000000015		Writes coded decimal data
	[SFT] [◀] (sign)		
	[2] [3] (numeric value)		
[ENT]	D000'00·D000'01 = -000000023		

[SFT] [◀] key: Inputs minus sign (during write)

[SFT] [▶] key: Inputs plus sign (during write)

Data write is inhibited in write protect mode.

7-1 Timer/Counter Read

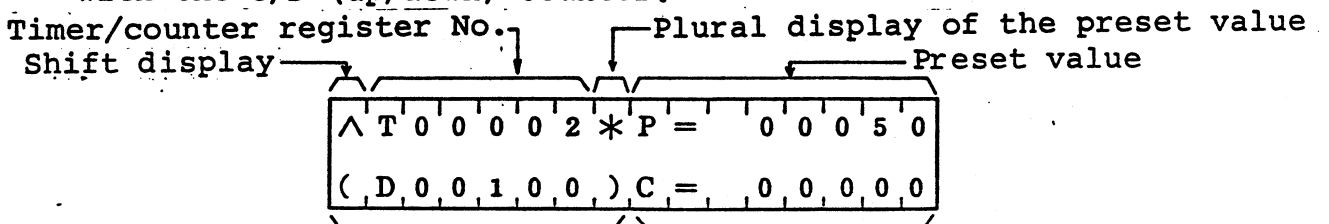
Function: Reads current and preset values of the timer/counter



(1) When the preset value in the program is 1:

* - 操作	Display	Comment
[C] (register key)	C REG No. = 00000	<ul style="list-style-type: none"> Selects register key Inputs register number Indicates that preset value is being searched (data remains on screen for a few seconds). Displays preset value (P) and current value (C) (when preset value is a constant).
2 (register No.)	C REG No. = 00002	
[ENT]	C00002 SEARCH-EXE C00002 P= 00010 C= 00000	
[+>] [ENT] [DBL HEX]	C00003 C= 00030 C00003 P= 00030 (D00100)C= 00030 C00003 P= H001E (D00100)C= H001E	<ul style="list-style-type: none"> When the cursor key is used to change the register number, only current value is displayed. Displays register number stored at bottom left position. Hexadecimal display
[+>] [ENT]	C00004 C= H0000 C00004 P=NO USE C= H0000	

- [+>] [←] When changing the register number with the plus or minus cursor keys, only the current value is displayed.
- [ENT] The preset value is displayed when ENT key is pressed.
- [DBL
HEX] Used to switch to hexadecimal or decimal display.
- No preset value is displayed because a preset value is not used with the U/D (up/down) counter.

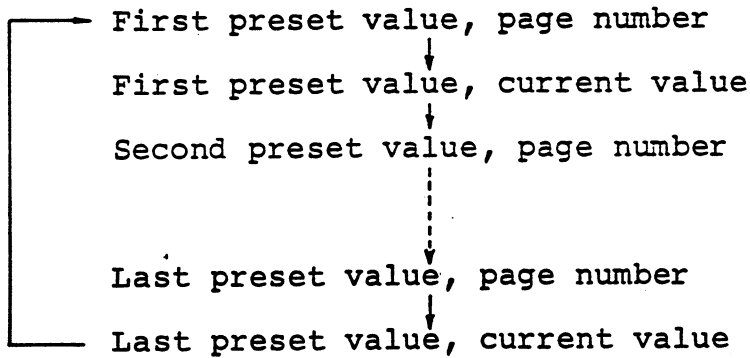


Register number in which the preset value is stored Current value

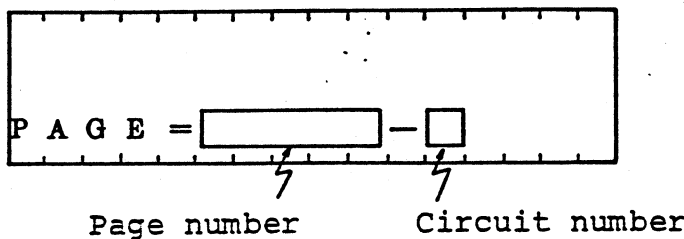
(2) When there is more than one preset value in the program:

Key operation	Display	Comment
<input type="checkbox"/> T (register key)	T REG NO. = 00,000	o Selects register key
<input type="checkbox"/> 2 (register No.)	T REG NO. = 00,002	o Inputs register number
<input type="checkbox"/> ENT	T00002*P= 00050 PAGE=00001-1	o "*" and page numbers are displayed for more than one preset value
<input type="checkbox"/> ENT	T00002*P= 00050 (D00101)C= 00,000	o Press ENT key again to display preset and current values
<input type="checkbox"/> ENT	T00002 P= 00100 PAGE=00002-1	o "*" is not displayed for the last preset value.
<input type="checkbox"/> ENT	T00002 P= 00100 C= 00,000	
<input type="checkbox"/> ENT	T00002*P= 00050 PAGE=00001-1	o The initial preset value is displayed again.

- o An asterisk (*) is displayed when more than one preset value is used in the program.
- o By pressing the ENT key, the page numbers and order of current values are displayed.



- o The positioning of data display fields when more than one preset value is used in the program is shown below:



7-2 Writing the Preset Timer/Counter Value

Function: Writes the preset timer/counter register value.

Key sequence: (Timer/counter read) → DEST → [Numeric value] → ENT

(1) When the preset value in the program is 1:

Key operation	Display	Comment
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; margin: 2px;">T</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">1 SET</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">0 RST</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">ENT</div> </div> <div style="text-align: center;"> <p>(timer/counter read)</p> </div> </div>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">T00010 P= 00010 (D00112)C= 00005</div>	<p>o Reads the timer/counter</p> <p>When preset value is register value.</p>
<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; margin: 2px;">DSET</div> </div>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">T00010 P= 00010 DSET = 00010</div>	
<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; margin: 2px;">+></div> </div> <p>(numeric value)</p>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">T00010 P= 00010 DSET = 00011</div>	
<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; margin: 2px;">ENT</div> </div>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">T00010 P= 00011 (D00112)C= 00005</div>	
<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; margin: 2px;">+></div> </div>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">T00011 C= 00000</div>	<p>When preset value is a constant</p>
<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; margin: 2px;">ENT</div> </div>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">T00011 P= 00200 C= 00000</div>	
<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; margin: 2px;">DSET</div> </div>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">T00011 P= 00200 DSET = 00200</div>	
<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; margin: 2px;"><-</div> </div> <p>(numeric value)</p>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">T00011 P= 00200 DSET = 00199</div>	
<div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; margin: 2px;">ENT</div> </div>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">T00011 P= 00199 C= 00000</div>	

o Data write is inhibited when using the write protect mode.

Note:

1. If the preset timer/counter value(a constant) is changed, the program modification must be saved to cassette tape, etc. (Refer to 2-4, Notes for Use.)
2. When the PC is being operated by ROM, the preset timer/counter value cannot be updated. (Refer to 2-4, Notes for Use.)
3. There are programming and/or operational constraints, depending on the version of the EX250, EX500, or EX200B being used. (Refer to 2-4, Notes for Use.)

(2) When there is more than one preset value being used in the program:

Key operation	Display	Comment
<div style="display: flex; gap: 5px;"> T 2 ENT </div> (timer/counter read)	<pre>T00002*P= 00050 PAGE=0,0,0,1,-1</pre>	<ul style="list-style-type: none"> o Reads the timer/counter
ENT	<pre>T00002*P= 00050 (D0,0,1,0,1),C= ,00,0,0</pre>	<ul style="list-style-type: none"> o Pressing ENT key to select the desired preset value
ENT	<pre>T00002 P= 00100 PAGE=0,0,0,2,-1</pre>	
DSET	<pre>T00002 P= 00100 DSET = 00100</pre>	
+>	<pre>T00002 P= 00100 DSET ,0,0,1,0,1</pre>	<ul style="list-style-type: none"> o Inputs data
ENT	<pre>T00002 P= 00101 C= 0,0,0,0</pre>	

o When there is more than one preset value being used in the program, press the ENT key to search for the desired preset value, then press the DSET key.

8-1 Device Read

Function: Reads the X,Y,Z,R devices.

Key sequence: [Device key] → [Device No.] → ENT

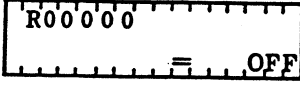
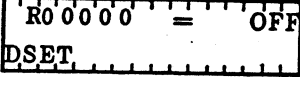
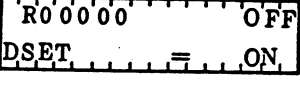
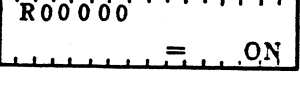
Key operation	Display	Comment
[SFT] [R] [RW] (device key)	'R' 'DEVICE No.' = .00,000	○ Selects the device key
[1] [SFT] [D] [SET] [7] (device number)	'R' 'DEVICE No.' = .00,01D	○ Inputs the device number
[ENT]	'R0001D' = . ON	
[DBL] [HEX]	'RW0001' = HB467 ●●●●●●●●●●●●●●●●	○ Displays 16-bit data
[◀]	'RW0000' = HAAAA ●●●●●●●●●●●●●●●●	
[DEL] [HEX]	'R00000' = OFF	○ Releases 16-bit display

- The [DBL/HEX] key is used to switch between 1-bit and 16-bit displays (for the device read operation)

8-2 Device Write

Function: Writes X, Y, Z, R devices.

Key sequence: (Device read) → DSET → 1 SET or 0 RST → ENT

Key operation	Display	Comment
SFT R ENT RW (device key)		o Reads the device
DSET		
1 SET		o Inputs 1 SET or 0 RST key
ENT		

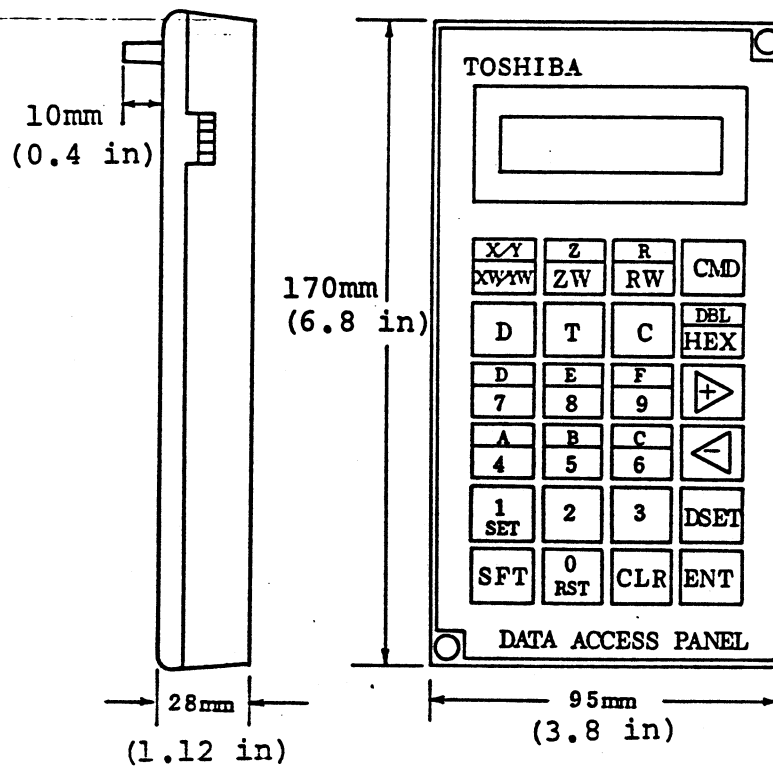
o Data write is inhibited when using the write protect mode.

Appendix 1 Specifications

1. General Specifications

Item	Specifications
Voltage range	5 Vdc 5% (supplied from CPU unit)
Current consumption	Max. 0.4 mA
Operating temperature	0°C to 40°C (32° to 104°F)
Storage temperature	-20°C to 75°C (-36° to 167°F)
Humidity	20% to 90% (no condensation)
Vibration	16.7 Hz, 3 mm p-p
Shock	10G in X, Y, Z directions, respectively 3 times
Atmosphere	No corrosive/flammable gases
Weight	400g (14 oz)
Cable length	2 m (6.6 ft)

2. External Dimensions



Appendix 2 Error Messages

Message	Corrective action
! BATT FAIL (battery failure)	Battery-voltage low Check battery and replace if necessary
! COMM T/O (communication time out)	No communication between CPU unit and DP100. Check for loose or shorted connections.
! CPU ERROR	The PC is not functioning properly. Replace the CPU unit.
! DP COMM ERR (DP communication error)	Faulty data received by DP. Check for loose or shorted connections between the CPU unit and the DP100.
! DP ROM ERR (DP ROM error)	An error has been detected in the DP system program. Check the DP100 and replace it if necessary.
! ERR (PROM) (error PROM)	This operation has been disabled since the ROM cassette was installed. Turn off the power switch, remove the ROM cassette and try again.
! E-PWR FAIL (expansion power failure)	The voltage level in the expansion I/O unit is low. Check the expansion I/O unit's power supply and replace if necessary.
! ERROR DOWN	The PC is in a down state because an error has been detected. Reset the error using a dedicated programming unit (GP100, MP100).
! ILLEGAL KEY	An illegal key or keys was pressed. Check your input and follow the correct key operation procedures.
! ILL INST (illegal instruction)	An illegal instruction has been detected during program execution. Check program contents for proper instructions.
! INVALID	This operation is not valid. Refer to Constraints on PC, in 2-4, Notes for Use.
! I/O UNMATCH	I/O assignment data and installation state do not match. Install unit according to I/O assignment data (if this error continues, replace base unit or I/O module).

Appendix

Message	Corrective action
! I/O NO SYNC (I/O not synchronous)	No response was obtained from I/O module to the corresponding I/O assignment data. Check I/O unit and I/O mounting state. (If this error continues, replace base unit or I/O module.)
! I/O BUS ERR (I/O bus error)	I/O bus error has been detected. Check expansion I/O cable and I/O mounting state. (If error continues, replace base unit or I/O module.)
! LIMIT OVER	Set value or register number exceeds limit. Specify value within acceptable range.
! LINK ERROR	Computer link is not functioning properly. Press computer link reset switch to correct.
! MEMORY FULL	Program memory is full. Shorten program or use the host system for expansion needs.
! MEMORY ERR (memory error)	Program memory is not functioning properly. Replace the CPU module.
! NO END ERR (no end error)	No end command in program. Write in an end command with a dedicated programming unit (MP100, GP100).
! OPR ERROR (operand error)	The output operand was specified as input. Reset program or I/O allocation data.
! PC COMM ERR (PC communication error)	Faulty data received by PC. Check for loose or shorted connections between CPU unit and DP100.
! ROM ERROR	ROM type in cassette is not compatible with PC. Or, the ROM contents have been destroyed. Replace ROM cassette.
! SCAN OVER	Scan time exceeds specified value. Shorten program or use the host system for expansion needs.
! TOSLINE ERR (TOSLINE error)	TOSLINE 30 is not functioning properly. Check according to TOSLINE 30 User's Manual.
! WD-TIMER (watchdog timer)	An error has been detected in the system program. Cycle power OFF and ON again to check program.
! WRITE PROTECT	Write protected. Execute write enable (command 10)

Note: For error messages other than those stated above, refer to the PC User's Manual.

