PWS-700T PLC WORKSTATION

APPLICATION MANUAL

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About PWS-700T

B.1 Introduction

The PWS-700T is an intelligent operator panel that provides the high performance and functionality. PWS-700T is a miniature industrial control operator Panels for your PLC. Functionally speaking, the PWS-700T is the most compact member of the PWS Series PLC Workstations family. The PWS-700T is equipped with a 4.7" (240Hx128V) liquid crystal display and touch screen. The IP 65 (NEMA 4) rated front panel seal and INDUSTRIAL GRADE touch screen make the product rugged and durable. With the CE mark on the product, you can count on the PWS-700 as a dependable partner of your applications. It accesses internal relays and registers of your P.L.C. through a serial port. You can configure the 700T with ADP3, which is a powerfully Windows program that supports all its sister products.

This chapter describes how to configure and install your 700T.

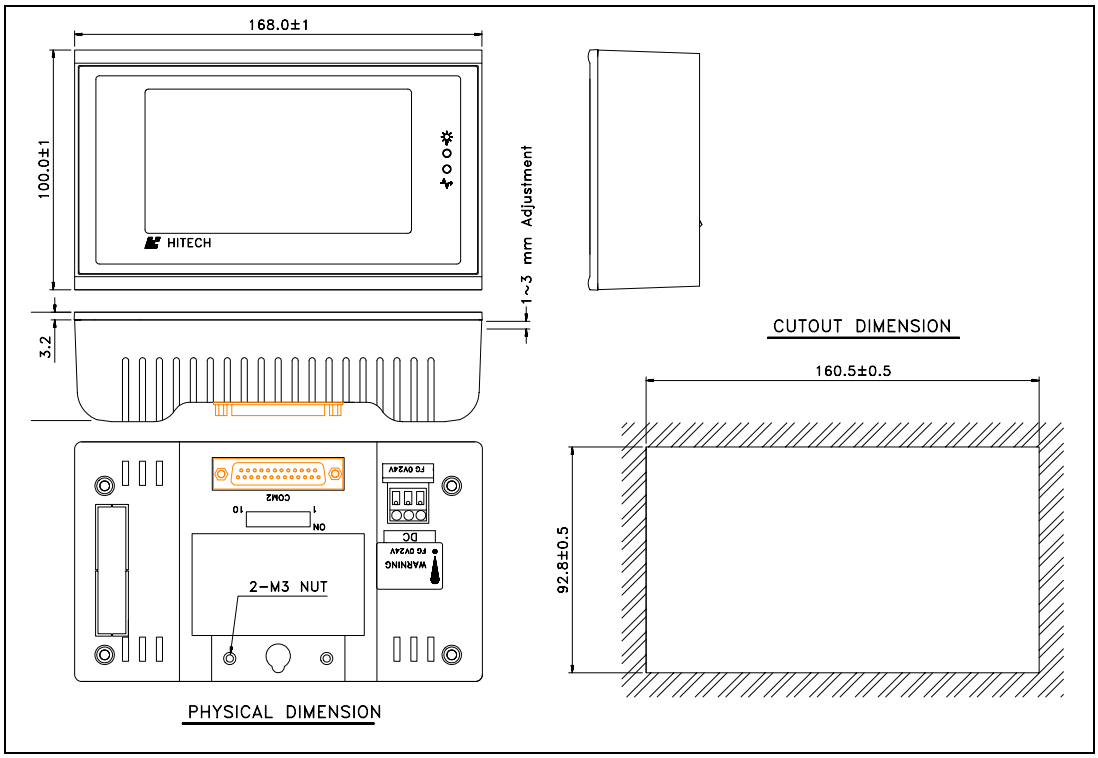
B.2 General Specification

Item	Description
Display Type	Blue mode STN LCD
Display Size	4.7" (diagonal)
Number of Pixels	240(H)x128(V)
Display Adjustment	Contrast adjustable by external keys
Back Light	CCFT; Life time is 20,000 hours under normal temperature and humidity
Touch Screen	Matrix resistive type: Number of switches is 15x8；ITO glass backing panel ; Over 1 million point activations ; Hard coat is resistant to most solvents and chemicals.
Input Power	24VDC±10%; Under 10W
Flash Memory	640K bytes
RAM	128K bytes
Communication Port (COM2)	25-pin D Type; Supports RS232/RS422/RS485
Front Panel Seal	IP65 / NEMA 4
Operating Temperature	0~50℃
Storage Temperature	-20~60℃
Ambient Humidity	20-90% RH (non-condensing)
Vibration Endurance	0.5mm displacement, 10-55Hz, 2 hours per X, Y, and Z-axis

	directions
Shock Endurance	10g, 11ms three times in each direction of X, Y, and Z axes
RF Emissions	CISPR 22, Class A
Electrostatic Discharge	IEC 801-2 Level 3
RF Susceptibility	IEC 801-3 Level 3
High Frequency Transients	IEC 801-4 Level 3
Weight	0.55 Kg
Cooling	Natural cooling

B.3 Dimensions

This section illustrates the dimensions of the 700T as well as the cutout dimensions. The unit of dimensions is millimeter. You should allow 10 cm (4") of clearance behind the workstation for cable connectors and 5 cm (2") above and below for airflow. Method of installation: Unscrew the back cover of PWS, Mount the PWS to the preserved hole from the front side. Attach the back cover of PWS from behind, and fasten the four screws with a screwdriver. Don't tighten the screws with too much force or it may cause a damage of the panel.



B.4 Power Supply and Electrical Grounding

The three-position power connector accepts 24VDC only. The unit's maximum power consumption is 10 watts at 24VDC. The rating of fuse is 0.5A.

You must make sure that your 700T is properly connected to earth ground. You must properly ground your 700T to prevent it from radiating radio frequency noise.

If you connect a communications cable to your unit after static electricity has built up or when the 700T and the other device are on different grounds, the resulting discharge could damage the electronics in either device.

B.5 Touch Panel

The PWS-700T is equipped with a resistive type touch panel. The touch panel has a matrix of 15(H) by 8(V) switches and each switch just covers an area of 16(H) x 16(V) display dots. You can design touch keys for each of your screens. You can configure a touch key to display another screen or control an on/off location within your PLC. The shape of the touch key must be rectangular, but the size of a touch key is configurable and can be as small as a single touch switch or as large as the entire screen(15x8 switches). One screen can have up to 120 touch keys.

When you press a touch key, the Workstation responds by sounding the buzzer for 200 milli-seconds (default) and reversing the color of that touch key for 200 milli-seconds. With the feedback, you know the Workstation accepts your key-press. You can use Miscellaneous Settings dialog box of ADP3 to set the parameter of touch screen for your Workstation.

For each changeable Object of a screen, the Compile function of ADP3 automatically groups those touch switches that the display area of the Object covers to form a touch key for the selection purpose. With the touch panel, it is very easy to select and change a location within your PLC on the current screen; you just press the display area of the Object you want to change; the Workstation marks your selection by reversing its color and displays the Numeric Touch Keypad for you to change the selected PLC location.

B.5.1 Built-in Touch Keys

The built-in touch keys are touch keys that the ADP3 automatically configure for your application so that you don't have to spend any time to program them. The built-in touch keys allow the operator to select and change a PLC location very easily.

There are two groups of built-in touch keys called Numeric Touch Keypad and Password Reentering Keypad that the Workstation displays for you to change data. The Numeric Touch Keypad Its image is shown in the following

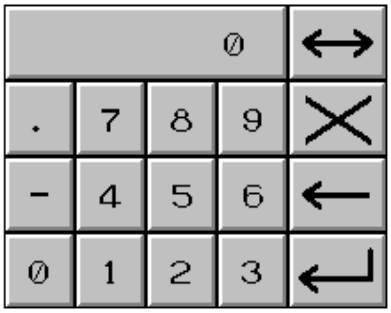


Figure B-1

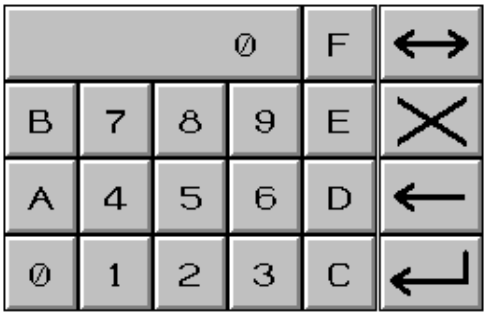
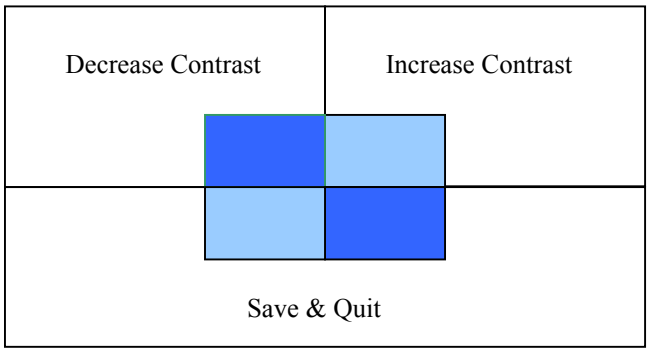


Figure B-2

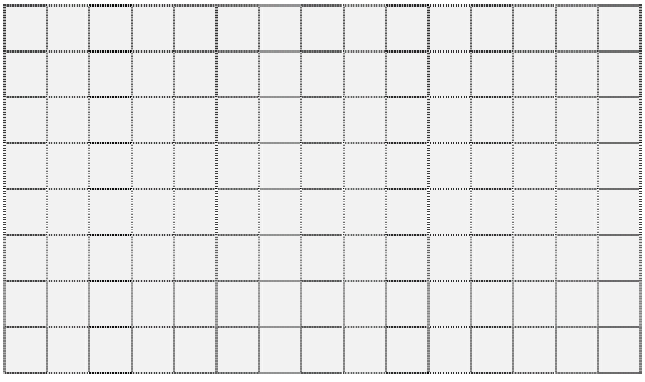
B.5.2 Running Diagnostics

To run the Workstation's built-in diagnostics program, use the following procedures:

1) Set DIP switches SW3 and SW4 of the 700T to off. After power on, the 700T displays the following pattern.



2) Press Save & Quit. If the touch key can work, the 700T displays the following screen to let you test each of the 15x8 small rectangular cells to represent the 120 touch switches. You can't return to Diagnostic Menu until you have pressed every touch switches.



3) To calibrate the touch panel switches, press it and see if the corresponding cell on the 700T screen changes color.

B.6 Setting of DIP Switches

There are ten DIP switches that you can access through the back cover. The purposes of these switches are stated in the following:

SW1	SW2	SW7	Menu/Run/Download
On	On	On	The 700T displays the System Menu after self-test
On	On	Off	The 700T starts running the user application immediately after self-test.

SW3	SW4	Operation Mode
x	On	User application mode
On	Off	Burn-in test mode
Off	Off	Bench test mode

SW5	PLC Communication
On	If you want the Workstation to work without a PLC connected, set this switch to on; this allows you to view downloaded screens without a PLC.
Off	The Workstation uses the downloaded parameters for PLC communications.

SW6	Reserved switch
Off	Should be off

SW8	Default User Level
On	The default user level is 1 if the Workstation requires no password to start its operation.
Off	The default user level is 3 if the Workstation requires no password to start its operation.

SW9	Reserved switch
On	Should be on

SW10	COM2 Port
On	This setting is for most PLC drivers.
Off	This setting is only for the driver of Mitsubishi A Series CPU port.

B.7 Self Test

After power is applied, the Workstation runs a self-test that checks its hardware. After each test, the Workstation displays the result as shown in the following example. The version number of ROM BIOS refers to the EPROM chips, which will likely never change.

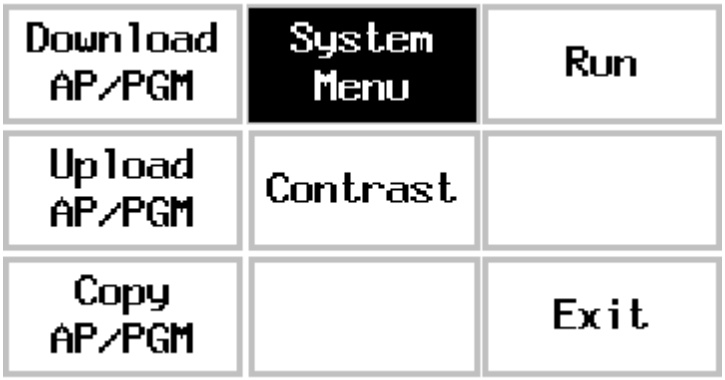
```
    Industrial Workstation
     ROM BIOS Version 1.0
(C) 98' Hitech Electronics Co.
 Display Type      Mono STN LCD
 System RAM Size         128 KB
 Video RAM Size           32 KB
 Firmware Memory Size    128 KB
 User Memory Size        640 KB
 Working RAM Test        Passed
 BIOS ROM Checksum       Passed
 Firmware Checksum       Passed
 Application Checksum    Passed
 Com. Port Test          Passed

 DIP SW Setting (8..1)=11001111
```

If you have interrupted a download to the 700T by switching off the power, disconnect the communication cable, or click cancel button in the ADP3 while a download is in progress, the self-test may report a problem in the Firmware Checksum or Application Checksum. You can ignore these errors and try to download again.

If there are any items of the self-test the 700T does not pass, the message "Error ! Press any keys to go on." appears. The Workstations continues its operation after you press any keys.

B.8 System Menu

After the self-test, the 700T displays System Menu as shown in the following figure if the DIP switches SW7 is set to on.

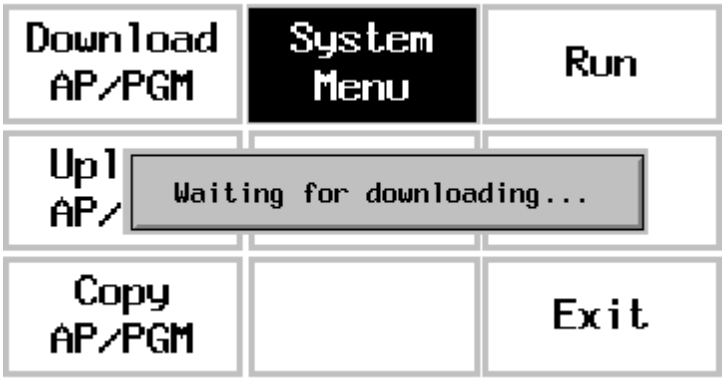


The commands on the System Menu are summarized in the following:

Commands	Function	User Level
Download Application	Allows you to download an application to the 700T from a PC or another 700T.	1
Run Application	Starts running your application.	1-3
Copy Application	Allows you to copy the application in the 700T to another 700T.	1-3
Upload Application	Allows you to upload the application in the 700T to a PC.	1-3
Adjust LCD contrast	Allows you to set the contrast or brightness of the display.	1-3
Exit	Starts from the self-test again.	1-3

B.9 Downloading Application

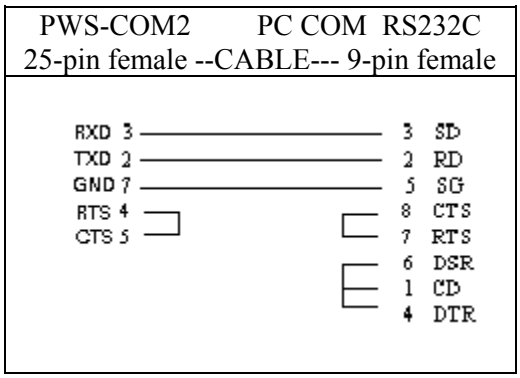
To make the 700T Workstation ready for receiving your application data downloaded from a PC or another 700T, press the Download Application button on System Menu. The Workstation displays the message "Waiting for downloading...” when it is ready.



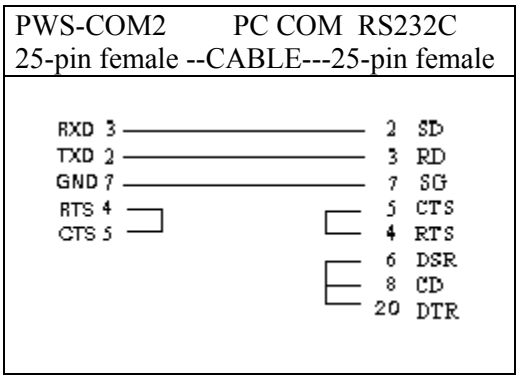
After downloading, the System Menu is active again.

You should have a cable with the following connection for the download.

PWS to PC's 9-pin connector



PWS to PC's 25-pin connector



Warning: To avoid electric shock, be sure to switch off the power when connecting the communication/download cable to the PWS unit .

B.10 Setting Operating Parameters

You can use Communication Parameter dialog box of ADP3 to set the parameters for the communications between your 700T and PLC. The parameters set in ADP3 is transmitted to the Workstation along with all other data when you download an application.

To get Communication Parameters dialog box, click Communications button in Workstation Setup dialog box. The Communication Parameter dialog box appears with the following options:

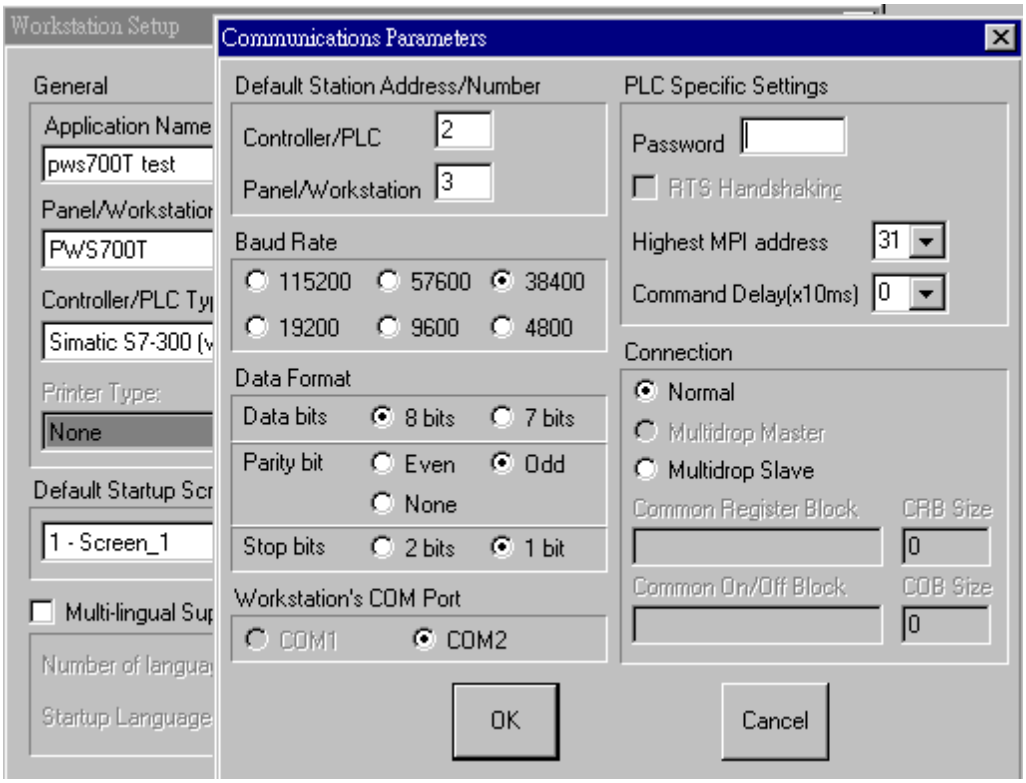


Figure B-3

Following are descriptions of each of these options:

Options	Description
Controller/PLC	Select a number to specify the address of PLC.
Panel/Workstation	Select a number to specify the address of your 700T. This parameter is only useful for some types of PLCs.
Baud Rate	Specify the baud rate for communications between the Workstation and the PLC.
Data Format	Specify the number of data bits, the

	number of stop bits, and the type of parity check bit for the communications between the 700T and the PLC.
Workstation's COM Port	Fixed at COM2 as there is no other selections.

RTS handshaking	Check this item to specify the 700T should wait to transmit until the CTS input on the communication port is asserted. This is sometimes called "hardware handshaking." This is available for only a number of PLCs.
Command delay (x10ms)	Enter a number between 0 and 255 to specify the amount of time that the 700T waits between sending commands to your PLC. The unit of time is 10 milliseconds and the default is 0. However, many PLCs consume additional scan time to service requests from the 700T, and if you find that your PLC's scan time is too long, you can increase the "Command delay" to slow down the Workstation. This is available for only a number of PLCs.
PLC Model Code	Select a number to specify the sub-type of your PLC. This parameter is only useful for some types of PLCs, such as Simatic S5.

You can use Miscellaneous Settings dialog box of ADP3 to set the screen saver time for your 700T. If you set the screen saver time to 0, the 700T never turns off the back light.

B.11 Serial Communication Port (COM2)

COM2 is a serial port that supports RS-232, RS-422, and RS-485 operation. The pin assignments of the port are listed in the following table:

Pin	**Function**	**Pin**	**Function**
1	Chassis ground	14	RS-422 TXD+ and RS-485 TXD/RXD+
2	RS-232 TXD	15	RS-422 TXD- and RS-485 TXD/RXD-
3	RS-232 RXD	16	RS-422 RXD+
4	RS-232 RTS	17	RS-422 RXD-
5	RS-232 CTS	18	(no function)
6	(no function)	19	(no function)
7	Signal ground	20	(no function)
8 *	(no function)/5V max 250mA output, when JB1-pin1-2 connected	21	RS-422 terminating resistor for RXD-; the other terminal of the resistor (120Ω, 1/2W) is already connected with the RXD+
9	(no function)	22	RS-422 terminating resistor for CTS-; the other terminal of the

			resistor (120Ω, 1/2W) is already connected with the CTS+
10	(no function)	23	RS-422 RTS+
11	(no function)	24	RS-422 RTS-
12	RS-422 CTS+	25*	(no function) /24V DC power input
13	RS-422 CTS-		

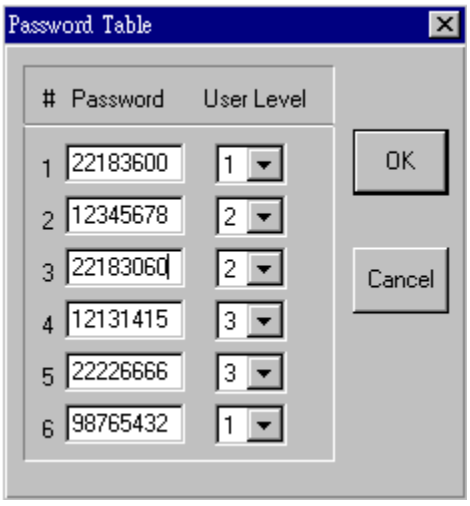
* Consult the factory if you want to use these two pins

B.12 Password and User Level

The 700T stores passwords in its Flash EPROM. A password has eight numeric characters. When you register a password, you must specify the user level associative with that password. The user level of a password determines the privilege of the user who enters that password to start the operation of the 700T. When a user wants to use the function of the System Menu, change to another screen, or make change to a PLC location, the 700T checks the user's user level. There are three user levels: level 1, level 2, and level 3. Level 1 users have the highest privilege and Level 3 users have the lowest privilege.

B.12.1 Registering Passwords

You can register up to six passwords for your application in ADP3. To register passwords and their associated user level, click Password button on the Workstation Setup dialog box. The ADP3 displays the Password Table as shown in the following figure. You can enter passwords as well as select the user level for them. The password data are part of the application data.

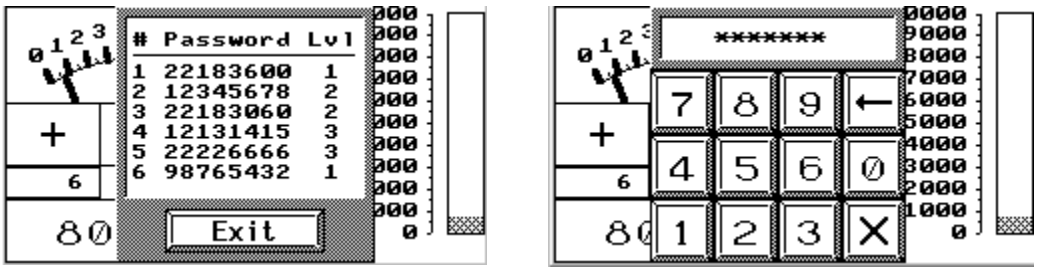


Therefore, remember to compile your application and download it to the 700T when you make any changes to the password table. The default passwords are 00000000, 00000000, 00000000, 00000000, 00000000, and 00000000. The default user level is level 1.

B.12.2 Displaying Passwords

To display the passwords of your application on the 700T,

you have to create an Action button on a screen and assign the function "Display Password Table" to that button. The 700T displays the password table as the example shown below, when a level 1 user presses and releases an Action button that is assigned the function of "Display Password Table."



B.12.3 Reentering a Password

When the 700T is running the user application, you can enter a password to change the current user level by pressing an Action button that is assigned the function of "Reenter Password." To cancel the input of a new password, press [X].

Note that the default user level is 1 after the power-on self-test if the DIP switch SW8 is set to on; the default user level is 3 if the SW8 is set to off.
When a screen object requiring a certain user level is activated and the current user level is higher than the specified user level with that screen object, the 700T automatically displays a box to let you enter a new password. This is a chance to change the current user level. The screen object proceeds to performs its function if a valid password with qualified user level is entered; otherwise, the 700T keeps on asking for a password or cancel the operation if [X] is pressed.

B.12.4 Setting the Lowest User Level

You are able to set the current user level of the 700T to level 3 by pressing an Action button that is assigned the function of "Set Lowest User Level."

B.13 Adjusting Display Contrast

You can adjust the contrast of the display at any time when the 700T is running your application. To increase the contrast, press an Action button that is assigned the function of "Contrast Up." To decrease the contrast, press an Action button that is assigned the function of "Contrast Down." To save the setting of the contrast, press an Action button which is assigned the function of "Save Contrast". The user can calibrate the LCD contrast by pressing the "Calibrate" button on System Menu as well. The Workstation

displays Select item as shown below.