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OPtima PC

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1. Introduction

The OPtima PC is made up of a single board computer with a 233 Mhz processor. It has 1 PCI expansion slot and 2 ISA expansion slots. External connectors are provided for 1 parallel port and 1 serial port. Connectors are also provided for attaching an external monitor and keyboard. The Model DSA2 is equipped with a 10.4" (800 x 600 pixels) active matrix "touchscreen" display, a floppy disk drive and a proprietary keyboard. The Model DSB2 is equipped with a 15" (1024 x 768 pixels) active matrix "touchscreen" display and an (optional) floppy disk drive.

The PC is supplied with a minimum of 64 MB of EDO RAM, with support for up to 128 MB. It also has 2 MB of on-board display memory, which is not expandable. This memory, along with the PCI-bus and on-board graphics controller, provides a 64-bit graphics engine which is excellent for most display intensive applications.

Note that for best results when using Wonderware, screens sets should be developed in the same resolution as the particular OPtima PC that is being used. Although Wonderware provides a means of "converting" resolutions, some elements may not appear as would be expected.

2. Installation

This is an Installation Category 3 and Pollution Degree 2 device. The wiring guidelines outlined in this manual are to be used in addition to all applicable electrical and safety codes. Be sure to follow all requirements of such codes as well as other recognized safety practices.

2.1 CE EMC Compliance

Wiring guidelines to ensure the machine is CE EMC compliant are included in this document. For additional wiring information, refer to the following publications:

Recommended Guideline for Wiring & Grounding Machine Controls
Society of the Plastics Industry, Inc.
1275 K Street, N.W.–Suite 400
Washington, D.C. 20005
(202) 371-5200

IEEE Guide for the Installation of Electrical Equipment to Minimize Electrical Noise Inputs to Controllers from External Sources
(IEEE Std 518-1982)

2.2 Mounting

Do not enclose the operator station in a small or tightly sealed cabinet or panel which would cause the surrounding temperature to exceed the rated temperature. Consideration must also be given to protecting the display surface. Do not mount the operator station so that the display is subject to mechanical damage or dust and dirt particles. Periodic cleaning using a soft, water-dampened cloth is recommended. Do NOT spray liquid cleaning agents directly onto the operator station. No matter which of the mounting versions is used, allow adequate room for vibration, air circulation and easy access. Pay particular attention to the accessibility of cable connectors.

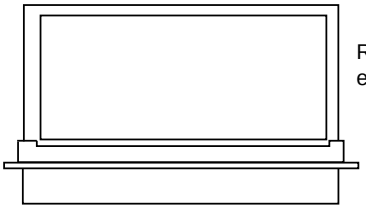
2.3 Wiring

The OPtima PC must be operated from a 24 Vdc Class 2 input. This unit requires 24 Vdc at 5 Amps, maximum. If an AC supply is required to provide the 24 Vdc, a standard 110 Watt supply with 24 Vdc output will suffice. Note that inadvertent power loss (or shutdown) may cause application problems. A battery-backed power supply is recommended in order to keep the OPtima running during times of power loss.

The bond strap must be connected at the nearest panel location.

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Include a switch or circuit breaker in the installation. It must be placed in close proximity to the equipment, within easy reach of the operator and must be marked as the disconnecting device for the equipment.



Remove cover for access to expansion slots.

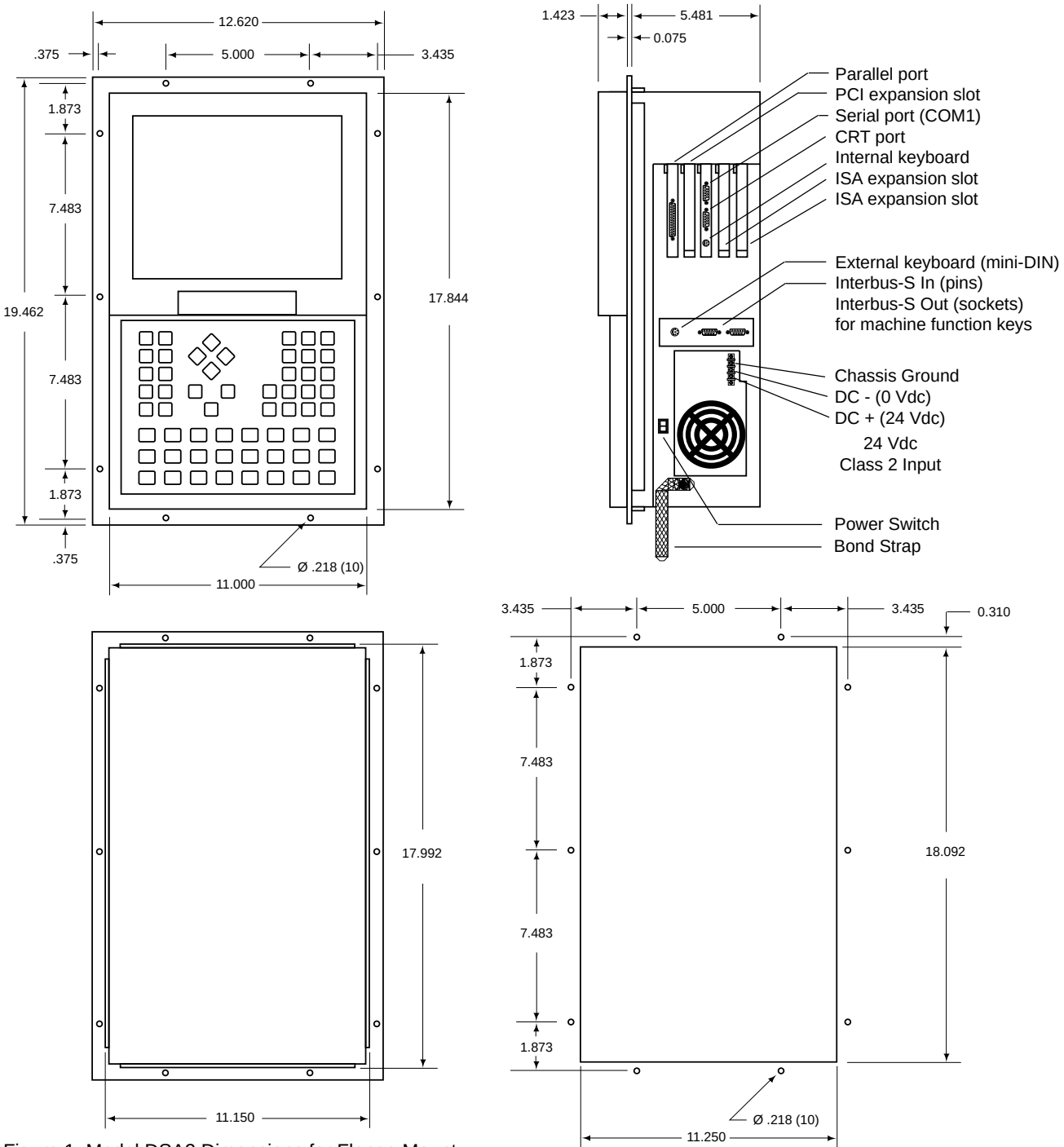


Figure 1. Model DSA2 Dimensions for Flange Mount

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Include a switch or circuit breaker in the installation. It must be placed in close proximity to the equipment, within easy reach of the operator and must be marked as the disconnecting device for the equipment.

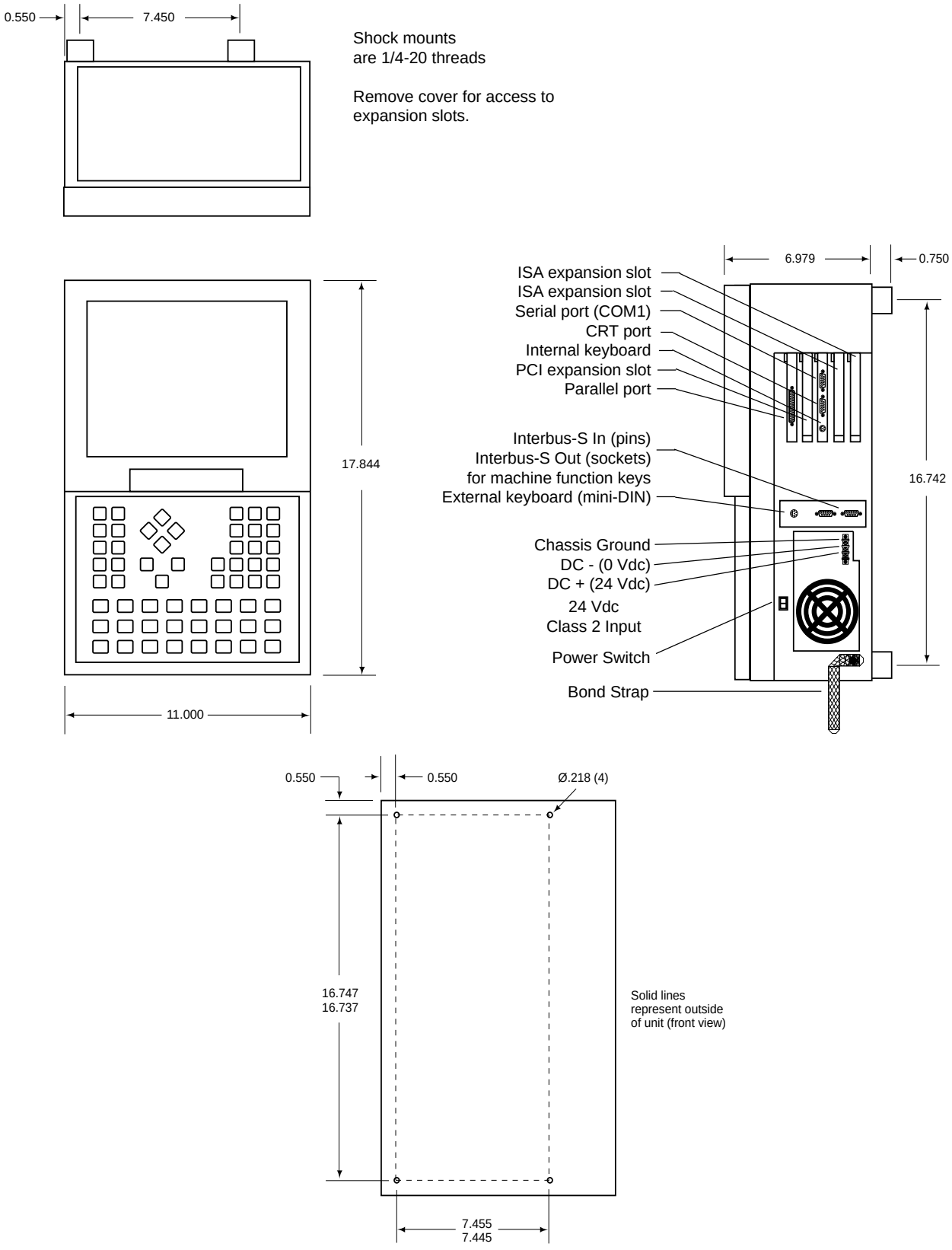


Figure 2. Model DSA2 Dimensions for Panel Mount

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Include a switch or circuit breaker in the installation. It must be placed in close proximity to the equipment, within easy reach of the operator and must be marked as the disconnecting device for the equipment.

Note that this panel cutout applies to both the Model DSB2 and the Remote I/O Station

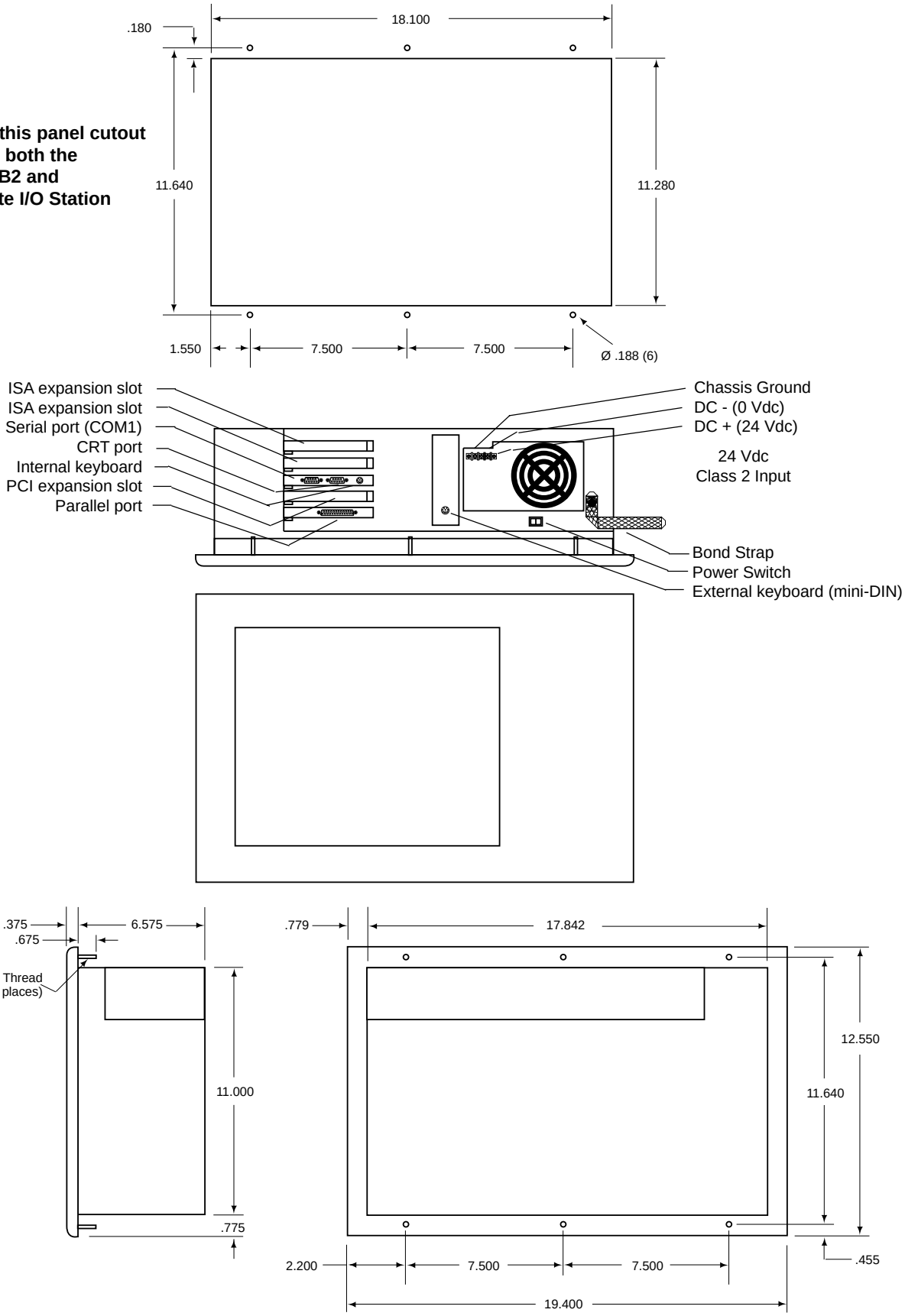
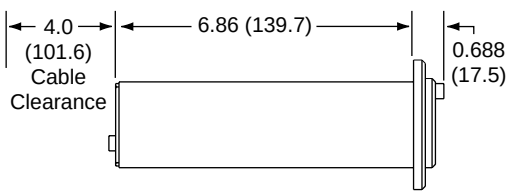
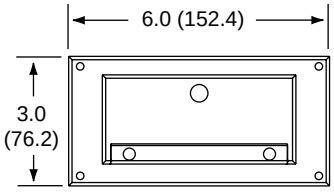


Figure 3. Model DSB2 Dimensions for Flange Mount

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Side View

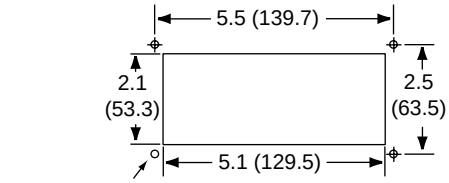


Front View

External Floppy Drive

Dimensions shown in inches; millimeters in parenthesis ( ).

Drive must be mounted within 15 in. (381 mm) of OPtima floppy cable connector.



Cutout and
Mounting Pattern

Figure 4. External Floppy Drive Cutout and Dimensions

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2.4 Adding Hardware

Observe proper ESD precautions (use an appropriately grounded wrist strap or similar device) when installing any device.

2.4.1 Adding Boards

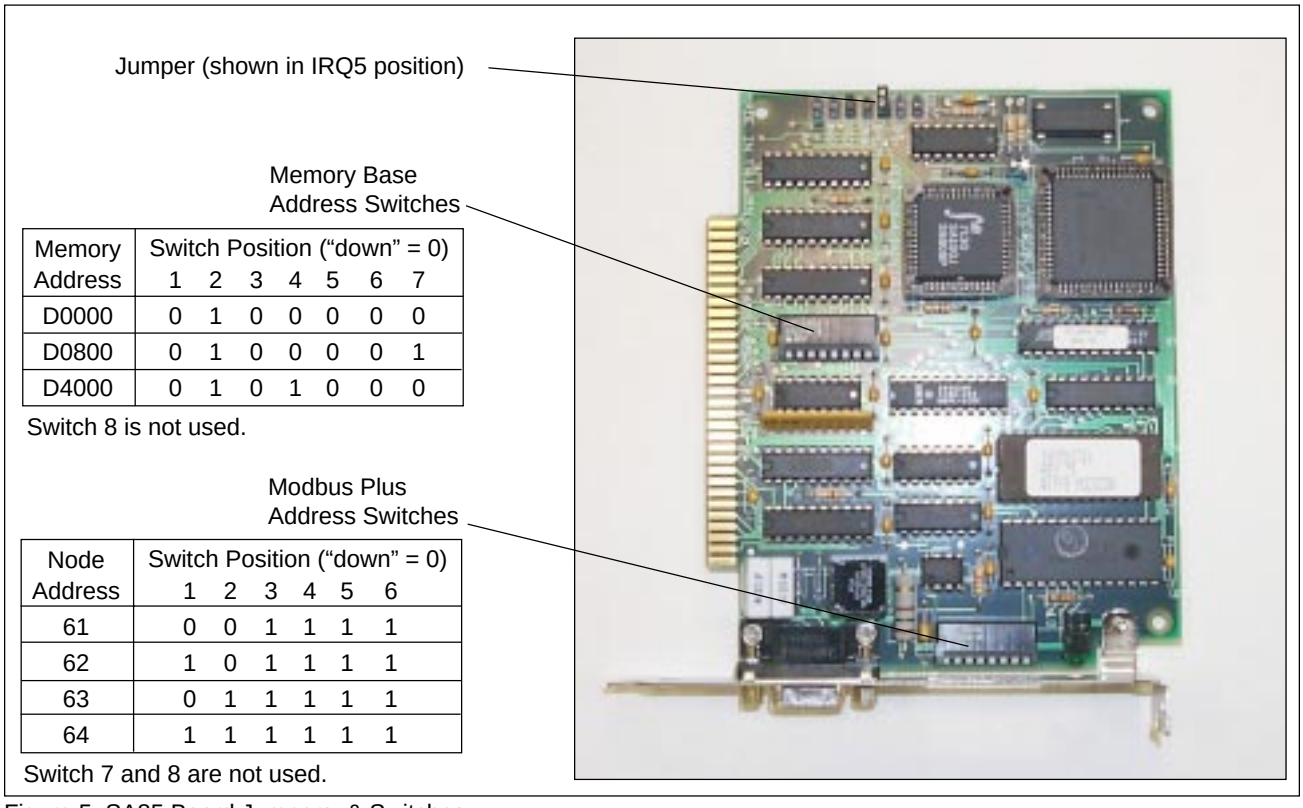
The OPtima PC has 1 PCI expansion slot and two ISA slots. Access to these slots is through a cover (at the top of the DSA2; the side of the DSB2). Half-size ISA cards will fit the ISA slots. Full size ISA cards will not. Cards longer than 7-1/4" (185mm) will not fit in the ISA slots. PCI cards must be the standard 4-3/4" (120mm) length. PCI Cards longer than this will not fit.

Card options that should function in the OPtima PC include PCI/ISA network (ethernet, etc.), modem, and serial cards. PCI serial cards that autodetect addressing may work best. It is not recommended to use sound cards in the OPtima PC (the voltages required for sound cards are not presently available).

2.4.2 Installing the Modbus Plus SA85 Board

1. Set the memory address to D0000 (switch 2 in the "up" position; all others in the "down" position). Place the jumper in the IRQ5 position. Set the Modbus Plus address switches to Address 61 (which is reserved for the OPtima PC). Other operator stations can be Address 62-64. Note that the address will be one higher than the binary value set on the switches, so that Address 61 is entered as "001111" (60). With the PC off, place the board in the ISA slot closest to the back. Screw down the board and replace the cover.

If a 2nd SA85 card is added, the IRQ and memory address must be different from the first card (set the memory address to D0800 or D4000 and check your system config for an unused IRQ). Units with 2nd cards shipped BEFORE March 2001 were setup as IRQ7, memory address D4000. AFTER March 2001, units with 2nd cards were setup as IRQ2, memory address 0800.



Memory Address	Switch Position ("down" = 0) 1	2	3	4	5	6	7
D0000	0	1	0	0	0	0	0
D0800	0	1	0	0	0	0	1
D4000	0	1	0	1	0	0	0

Switch 8 is not used.

Node Address	Switch Position ("down" = 0) 1	2	3	4	5	6
61	0	0	1	1	1	1
62	1	0	1	1	1	1
63	0	1	1	1	1	1
64	1	1	1	1	1	1

Switch 7 and 8 are not used.

Figure 5. SA85 Board Jumpers & Switches

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2. Power up the OPtima. From **Control Panel** (in **Settings**) select **Add/Remove Programs** and click **Install**. Insert the SW-LNET-INT disk in the floppy drive and select “A:setup.exe.” Install the file to the C:\Modicon\WinConX\MBX Driver directory. If the installer will not create this directory, create it first, and then perform the installation again. If you are prompted for a computer name and company, enter “Preferred Customer” and “Preferred Company” respectively. Restart the computer after the installation.

3. After restarting, go to MBX Driver Configuration (in the **Start, Programs, WinConX, MBX Driver** menu). Choose **New** and set the device type to SA85 and the device number to “0.” Select **Setup**. Set the Device Name to ClMbx0 (this is a lower case “L,” not the number “1”). Change Operation to Interrupt Driven. Set the Memory Address to D0000, IRQ=5 and Bus Number = 0. (For a 2nd card the memory address and IRQ must be set to match the switch and jumper setting for that card - see Step 1.) Click **OK** and return to the main menu. Click **OK** again to initialize the card. Select **Close** and then restart the system.

4. After restarting, insert the SW-WVD-INT disk in the floppy drive and select “A:setup.exe.” This will install the WinConx Virtual MBX. Use the default settings for where to install. Exit after the installation is complete.

5. Edit the Config.nt file (in the winnt\system32 directory) by adding the following line (EXACTLY as it appears below) to the end of the file:

device=%SystemRoot%\System\mbp16.sys (no spaces)

6. Edit the Autoexec.nt file (also in the winnt\system32 directory) by adding the following line (EXACTLY as it appears below) to the end of the file:

%SystemRoot%\System\mbp16vec 5d (a space between “vec” and “5”)

Note that “5d” is the NetBIOS vector. It must match the setting in the Modicon.ini file created below.

7. Path to the \winnt directory. (If you have previously opened Concept and tried to connect to a PLC, the following file will already have been created.) Using Notepad, either modify or create the file “modicon.ini” and include the following information:

```
[Ports]
COM1=COM1:9600,e,8,1 RTU 1000     (a space between “1” and “R” and
MBP0=5d                           also between “U” and “1”)
```

Note that the “5d” here matches the “5d” in the Autoexec.nt file. If, when connecting to a PLC, a resource violation error occurs change the Autoexec.nt file AND the modicon.ini file to “5c” and try again.

8. Install the ASB NT server (“MBPASB”).

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2.4.3 Adding Memory

Two slots of 72 pin SIMM (Single In-line Memory Module) sockets are available for on-board system DRAM (one slot is occupied by the standard 64 M of memory).

To insert a SIMM, place it in at a moderate angle. Note that it fits in the socket in only one direction. Push it in from an angle to an upright position. The retaining clips will grab and click into place. When positioned properly, the pins on the top of the vertical pins should rest in the holes of the SIMM modules.

To remove a SIMM, support it with a finger and use a pen or similar shaped object to press one retaining clip down. Repeat for the other side. When released, the clips will push the SIMM up and out of its upright position. Remove the SIMM from the socket.

3. Peripheral Devices

OPtima PC has an on-board flat panel/CRT controller. An internal cable is used to connect the computer card to the flat panel screen. If desired, an external CRT can be connected to the CRT connector on the side of the unit. An external keyboard can be hot-swapped (plugged in or un-plugged with power on) using the mini-DIN connector on the side of the unit.

A high speed, local bus IDE controller as well as a floppy controller are also included. The floppy controller controls the floppy drive (drive A). The IDE controller supports the internal hard drive, which is a 6.x GB drive as of this writing. The drive is set up in 2.x GB partitions, with sequential drive letters assigned for each partition. To check partitions, go to **Windows/My Computer** and select a drive. The size of the drive partition and how much of it is used will be displayed in the lower part of the **My Computer** window. Be sure to verify how much hard drive space remains before installing software. Filling a hard drive partition to capacity can cause application anomalies. As a minimum, 50MB should be left as scratch pad space for an application's temporary files. If more room for an application is required, switch to a different drive partition.

Other peripheral support includes two serial ports and a parallel port. The first serial port is defined as COM1 and is located on the same connector as the CRT connector on the side panel. The default setting for COM1 is resource address 3F8H (hex). The second serial port is defined as COM2 with a resource address of 2F8H. COM2 is used for the touchscreen controller and is NOT accessible to the user. The parallel port is located on the side slot closest to the front and is defined as resource address 378H and IRQ 7. The parallel port mode is ECP+EPP (enhanced parallel port). In most instances all of these port settings and resource addresses should remain as the default. Consult your peripheral device (printer, etc.) for appropriate settings for these ports.

4. The Operating System

The operating system for the OPtima PC is Windows NT 4.0. The BIOS is Award FLASH BIOS.

4.1 BIOS Password Settings

It is not recommended that users change the factory defaulted BIOS settings. The computer's CMOS memory has an integral lithium battery that should last for ten years in normal service. However, one area that may be of importance is the password settings to allow changes in the BIOS. There are no default BIOS Supervisor/User password settings as shipped from the factory. The difference in supervisor and user passwords is that the supervisor can enter and change the options of the setup menus, while the user can only see the main BIOS screen and its options, but cannot select any of those options.

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To set supervisor/user BIOS passwords, first connect an external keyboard (for the Page Up/Page Down function). Press **Del** on power up. This takes the computer into the AWARD BIOS setup. When the setup screen comes on, select the supervisor password. A small screen appears for password definition (up to eight characters), followed by a second screen to verify the entry. The method is the same for the user password. Once passwords are defined, password entry will be required before any BIOS settings can be changed.

IMPORTANT: There is no hidden entry into the BIOS settings! If the supervisor password is forgotten, no modifications will be allowed. If you chose to use passwords, make certain to record them.

To disable the password function, just press **Enter** when the Supervisor password option appears. Once the password is disabled, setup access is freely available. Consult the factory before making any significant BIOS settings. Making inappropriate modifications may disable the OPtima PC to the point of inoperation.

5. Setup

5.1 Windows NT Setup

5.1.1 Window Settings

The active title bar and caption (upper right _ and X in a Window) are set at size 18 in the Windows/Display/Appearance window. These can be changed to make them easier for touchscreen accessibility with a finger, however, this will affect the operation of any Wonderware screens that have been made for the OPtima PC. Because of the effect on Wonderware screens, it is not recommended that any display settings which effect the size of screen items be modified.

5.1.2 Regional Settings for Date

Windows NT is setup to use a four digit year for y2k compliance. The setting is found under **Regional Settings** (in **Control Panel**). Do not change this setting.

5.1.3 Date/Time Zone

The time zone is set for Greenwich Mean Time, with the option to adjust for daylight savings time disabled. In cases where SPC data is being gathered, an automatic adjust for the time can disrupt data being collected. This option can be changed by selecting **Date/Time** (in **Control Panel**) and changing the date/time to the preferred option.

5.1.4 Fonts

When creating screen sets for use with the InTouch development system, the user MUST use fonts that are also installed in the OPtima PC. It is recommended to download sample screens before developing an entire screen set, in order to make certain that fonts (and other items) appear as desired.

Installed Fonts include: Arial, Courier New, Lucida Console, Lucida Sans Unicoda, Marlett, Times New Roman.

Versions of the above include Baltic, Central European, Cyrillic, Greek, Turkish, and Western. If new fonts need to be installed, select **Fonts** (in **Control Panel**) and from the File menu, select **Install New Font**. Point the computer to the directory from which you are installing (i.e. A:\ ) and click **OK**.

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5.2 Installing the Wonderware License

If Wonderware has been installed, before using the application the end user must first install the Wonderware License. To do this, perform the following steps:

1. Select InTouch from the **Start** menu. Once the InTouch App Manager appears, go to the **Help** selection on the top toolbar.

2. Select **About Application Manager**, then select **View License**. A License Utility window appears.

3. Select **File** on the toolbar, and then the subtopic **Install License File**. Place the license disk in the A: drive. Set “Look In” to see the A drive. A License directory will appear. Double click on this directory to show the ww*.lic file.

4. Double click on **ww*.lic** (note that if the file is only highlighted and then **Open** is selected, it will not be installed).

5. A window showing **Domain:** and **Computer:** will appear. Leave the default settings (“Computer” and “Computer” are set at the factory). Click **OK** and the license will install.

6. Select **File** and **Exit** from the toolbar.

7. Click **OK** to close the About window.

8. Select **File** and **Exit** from the toolbar to close the App Manager window. Once InTouch is restarted the license will be recognized.

5.3 Power Shutdown/Battery Backed Power Supply

Due to the way Windows NT operates, it is recommended that the OPtima PC be powered down through the **Start** menu **Shut Down** sequence. Inadvertent power loss or shut down may cause application anomalies. A back up power source is recommended in order to keep the OPtima running in case of a power loss.

5.4 Backups

As with all computer files, we suggest you make backups of all applications and data. This can be accomplished by connecting to a computer network, connecting a parallel port device such as a ZIP drive, or installing a SCSI card and connecting a JAZ or ZIP drive. It is best to have a mandatory backup plan in case of hard drive failure. Hard drives cannot be reconstructed without backup files. Scheduling software can be purchased to perform scheduled backups of critical files.

6. The Display

The Model DSA2 display is a standard 10.4 inch flat panel screen with a resolution of 800 (horizontal) x 600 (vertical) pixels (SVGA). The Model DSB2 display is a 15 inch screen with a resolution of 1024 (horizontal) x 768 (vertical) pixels (XGA). Both are shipped from the factory set for 65,535 colors. Wonderware screens should be developed to match the screen resolution.

6.1 The Touchscreen

The touchscreen uses an analog resistive technology. Care should be taken to not puncture or scratch the surface with rough objects. Cursor movement can be recalibrated at any time. To perform the calibration, go to **Start**, then **Control Panel,** and select **ELO Touch**. Touch the calibrate button and a calibration window will appear, asking you to touch a few areas on the screen. You will be prompted to respond if the cursor moves. If cursor movement is not satisfactory, perform the calibration sequence again.

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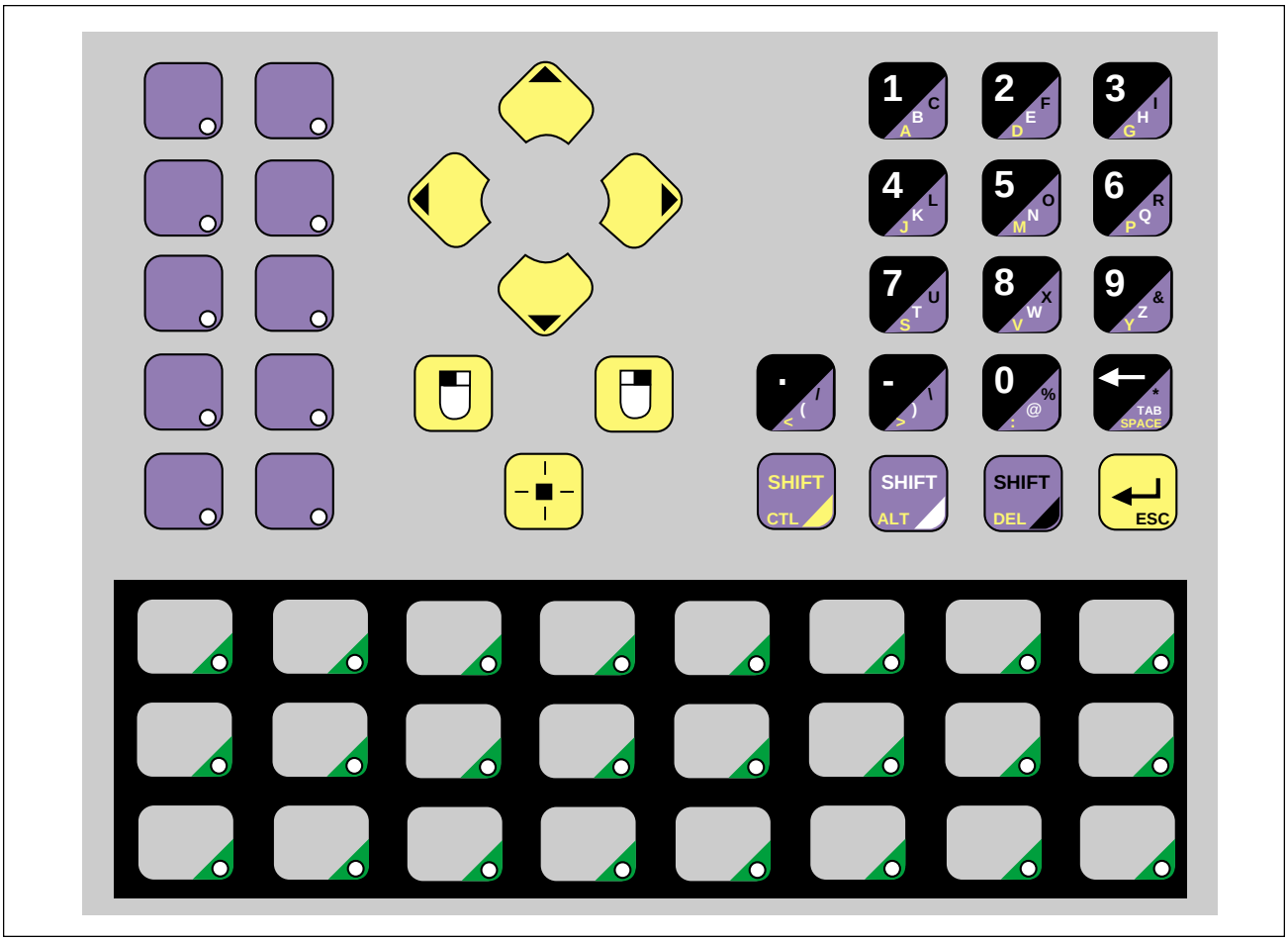


Figure 6. Model DSA2 Keyboard

7. Keyboard Functionality (Model DSA2 only)

This proprietary keyboard sends standard PC keyboard codes. Note that only one key can be pressed at a time.

Go to Button Template

Note that a “button template” (“OPtima PC Button Temp.doc”) for creating key labels is included in the “Other Files” folder of the instruction manual CD. It is in Microsoft Word format and can be edited to suit individual needs.

7.1 Function Keys

The light blue keys are mapped left to right, top to bottom, as F1 through F10. F1, F2 are the first row and F9, F10 are the last row. The yellow LED comes on when the key is pressed. These LEDs cannot be programmed.

7.2 Numeric Keyboard

The numeric keyboard allows number entry as well as ASCII character entry. To enter numbers, just press the number. To enter capital ASCII characters, first press the appropriately colored SHIFT key, of which there are three colors. For example, press and release the following keys (one at a time) to produce the character “A”:

Yellow Shift (release) A

To produce a lower case “a,” precede the above sequence by first pressing and releasing the scroll lock (–╋–) key. Note that this key has no other function (it does NOT function as an ASCII keyboard scroll lock key).

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7.2.1 Special Cases

The shift keys are used for the following special function:

CTL-ALT-DEL: Yellow Shift (release), CTL (release); Yellow Shift (release), ALT (release); Yellow Shift (release), DEL (release).

7.3 Left/Right Mouse Buttons

Once an NT window is activated, the left and right mouse button perform the same function that a standard left and right mouse button do.

7.4 Cursor Keys

The yellow half-diamond keys are used for left/right/up/down cursoring.

7.5 Machine Function Keys sent as Keyboard Buttons

The 24 gray machine function keys are mapped left to right, top to bottom. The first row of keys is sent as CTRL-SHFT-a through CTRL-SHFT-h. The next row is sent as CTRL-SHFT-i through CTRL-SHFT-p. The last row is sent as CTRL-SHFT-q through CTRL-SHFT-x. They can be remapped for use in Wonderware. A key LED turns on when the key is pressed. These LEDs are not programmable.

7.6 Machine Function Keys as Interbus-S Buttons

When the OPtima PC is ordered with the machine function Interbus-S option, the machine function keys are tied to the Interbus-S port. The bus connections are made with the two small D-sub connectors on the side of the Optima PC. The machine function keys are Bits 0 - 23 of the 2 input words. The LED's are Bits 0 - 23 of the 2 output words. When defining I/O in Concept, a generic I/O device (like IOBUS-203, which is a 2 word bidirectional device) or the 32-508-100 can be used to map the switches and LED's.

8. Environmental Specifications

Operating:

The operating temperature is 10 to 45°C, 8 to 80% RH (relative humidity) with a wet bulb temperature of 29°C and no condensation.

The maximum operating temperature of the Model DSA2 with the internal 120 MB Superdisk option included is 40°C.

Storage:

The storage temperature is -20 to 60°C, 5 to 90% RH with a wet bulb temperature of 29°C.

Vibration:

10 to 500 Hz at 4.91m/s^2 (0.5 G) continuous vibration.

Shock:

49.1 m/s^2 (5.0 G) shock for 11 ms with a half sinewave in each of three mutually exclusive perpendicular axes.

Weight:

25 lbs (11.4 kg)

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9. Automatic Logon to Windows NT

Since the Model DSB2 OPtima PC has no built-in keyboard functions, it is shipped from the factory with the Windows NT AutoLogon feature enabled. This has been accomplished by setting a username and password (under Start/Programs/Administrative Tools/User Manager) and matching that password with the DefaultPassword in the system registry (see below). For shipment the powerup user is “Administrator” and the DefaultPassword is “password.”

9.1 Disabling AutoLogon

Note that for the DSB2, if autologon is to be disabled a keyboard will be required (for the CTL-ALT-DEL poweron sequence and to enter a user name and password). To disable the autologon function, enter a “0” (zero) for AutoAdminLogon (using the registry editor as described below).

9.2 Bypassing AutoLogon

To bypass the autologon process (and logon as a different user), hold down the SHIFT key after a logoff or after a Windows NT restart.

9.3 Changing the Username and Password

Go to the User Manager (under Start/Programs/Administrative Tools) and add a user name and password. Then go to the registry editor (as described below). Enter that user name and password as the DefaultUserName and DefaultPassword, respectively. Set the AutoAdminLogon to 1 and save the changes. Now the system will logon automatically using the new user name and password.

9.4 Using the Registry Editor

Caution: Using the Registry Editor incorrectly can cause serious, system-wide problems that may require you to reinstall Windows NT in order to correct them. Any problems that result may not be able to be resolved. USE THIS TOOL AT YOUR OWN RISK.

Note that the entries described here have already been made for the DSB2.

1. Go to Start/Run. Type in REGEDT32.EXE and click OK.

2. Find HKEY_LOCALMACHINE\SOFTWARE\Microsoft\Windows NT\Current Version\Winlogon.

3. From the Edit menu, choose Add Value. In the value name field, type “AutoAdminLogon” (without the quotes). Set the data type to REG_SZ and click OK. Enter a 1 in the string field for the new value name. Save the changes.

4. The following values should be assigned:
DefaultDomain Name DefaultUserName DefaultPassword

These values should be set to the values you would use when logging on.

5. If the DefaultPassword does not exist, one must be created. From the Edit menu, choose Add Value. In the value name field, type “DefaultPassword” (without the quotes). Set the data type to REG_SZ and click OK. Set the password to that of the user shown in the DefaultUserName. Save the changes.

Note that a default password must be provided. If the DefaultPassword is left blank, AutoAdminLogon will be set to zero when NT powers up (and autologon will not occur).

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10. Troubleshooting/Application Tips

Note: In ANY situation that requires the unit to be open, proper shutdown and ESD precautions MUST be followed.

Front keypad or touchscreen stops working:
Plug in an external keyboard (a Windows 95 keyboard will give you the **Start** key.) Using the **Start**, **Tab** and **Arrow keys**, go to **Control Panel\ELO Touchscreen**. Look to see that the COM Port is set to single touchscreen/Com 2. If it is not, set it to single touchscreen/Com2.

If the touchscreen still will not function, plug in a Windows 95 compatible keyboard. This will allow a user to move around the screen using keyboard functions. **Start/Tab/Alt** + alpha character and arrow keys should allow access to most functions. When the system can be shut off, open the front of the unit and look for misconnection of power and cables.

Loss of the display/backlight:
The backlight on the DSA2 will turn off after a 10 minute period of keyboard inactivity. Press any key to turn it back on. If this doesn't work, plug in a CRT to the connector on the side of the unit. After shutdown, open the unit and look for a loose cable at the single board computer or the display. A loose cable will make the screen appear all white. No backlight power will make the screen appear dark. Look for loose backlight cables and power connections.

There is also the possibility that a power loss on powerup could cause CMOS to be read improperly. If the display screen cannot be read, connect a CRT to the side of the unit and go into CMOS setup (Powerup the OPtima and immediately press the **Del** key). Under the Standard CMOS Setup option, see if the panel definition shows the correct resolution. Use **Page Up** to select that definition if it is not set that way. Press **Esc** and go to **Save and Exit**. The unit should now power up with the display readable.

When the System starts up NT, it performs a diskcheck:
This operation is generally performed if there was an improper shut down of the unit. This does not cause any application anomalies, just a longer power up while the disk is checked.

Wonderware InTouch will not recognize the License file:
Copy the *.lic file from the A:\License directory directly to C:\Programs\Factory Suite\Common\License directory. Create the License folder first if it does not exist.

Wonderware cannot open an application:
An application may have had its power shut down inadvertantly while running. From the **Start** menu, choose **Find**, and then search the drives for an **appedit.lok** file. Once found, delete this file. The application should now open.

Wonderware Title Bar does not go all the way to the top:
Go to **Control Panel\Display\Appearance**. Make certain that the Title Bar and Caption sizes are set to 18. If not, set them to 18 (or whatever the original size set by the OEM).

Wonderware Screens do not look "right" when transferred from the Development Computer to the OPtima PC:
Check the resolution mode in which the screen set was developed. The DSA2 is an 800 x 600 pixel resolution and cannot perform XGA (1024x768) resolution. Also, check in **Control Panel\Display** that the window title bar sizes are set to 18. If not, the top of the Wonderware screen may not fill in all the way to the top.

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11. Disconnecting the Display

If for any reason it is necessary to open the case, it may also be necessary to disconnect and remove the display from the rest of the case.

In order to detach the display from the rear portion of the case, you must remove the connector located on the backside of the display (refer to Figure 7).



(Connector is located on the backside of the display)

Figure 7. Disconnecting the Display

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Barber-Colman Company / Eurotherm Controls, Inc.
741-F Miller Drive, Leesburg, VA 20175
Phone: 703-443-0000
Fax: 703-669-1300
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