AdeptWindows

User's Guide

Version 1.0

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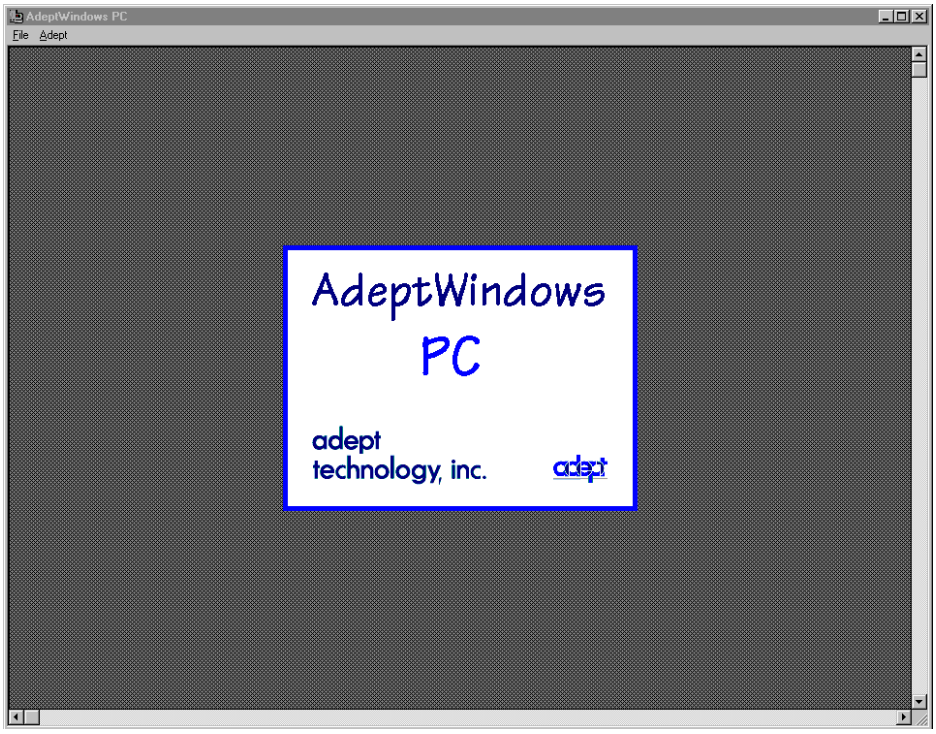

Version 1.0

Part Number 00962-00710, Rev. A

March 1997

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Printed in the United States of America

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Introduction

What Is AdeptWindows?

AdeptWindows is an application suite for the personal computer (PC) that provides new capabilities for the Adept controller and an interface to the PC.

The AdeptWindows PC component enables a PC to display the real-time Graphical User Interface (GUI) for an Adept controller. The AdeptWindows PC solution allows a PC connected to the controller using either Ethernet or a COM (serial) port to display the graphics previously output by the VME Graphics Board (VGB) to a dedicated display monitor. See Figure 1.

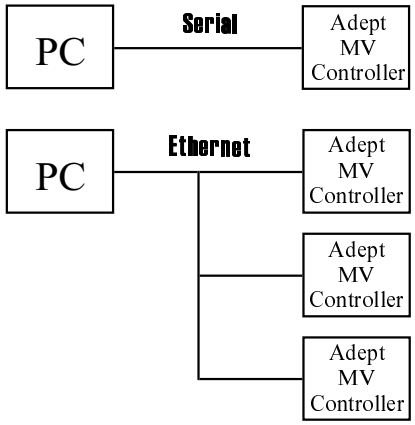


Figure 1
Connections Between PC and Adept MV Controller(s)

The AdeptWindows DDE product provides a standard Dynamic Data Exchange (DDE) server application to allow communication with other DDE-capable applications running on the PC (e.g., WonderWare®, Excel®). AdeptWindows Offline Editor is an upgrade to our popular offline editor that provides the system administrator/customizer with the capability to edit and manage disk files on the PC.

AdeptWindows represents the first step toward drawing the PC closer to the Adept controller. In keeping with the tradition of providing a safe and predictable development environment, Adept will continue this evolution of software tools in a phased approach. Starting with the user interface, the AdeptWindows PC application provides an alternative to the GUI using a dedicated monitor. In addition, the DDE functionality is embedded in the interface between the PC and the controller. This provides the first open link between standard applications running on the PC and the Adept controller. Extending this concept further, custom applications developed in C, C++, or Visual

Basic™ on the PC can use the DDE protocol to converse with the Adept controller through the DDE interface. See Figure 2.

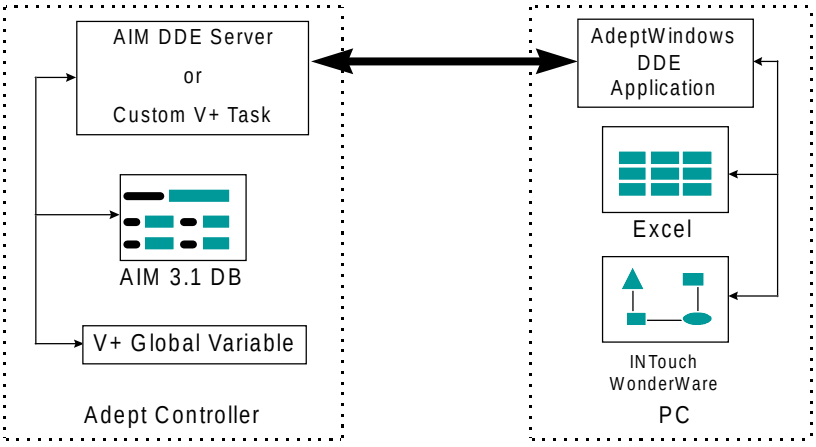


Figure 2
DDE Communication Between PC and Adept MV Controller

To ensure compatibility with existing V+ applications, the AdeptWindows PC product uses existing V+ instructions to display graphics to the user. AIM software and existing customer libraries are compatible, and only minor additions are needed to sense the connection between the Adept controller and a PC that is running AdeptWindows PC.

System Requirements

The following sections describe the requirements for using AdeptWindows with your PC and Adept MV controller.

PC Requirements

In order to use AdeptWindows, your PC should be configured as follows:

- IBM-compatible PC with a processor capable of running Windows® 95 (a 90 MHz Pentium processor or faster is recommended)
- Windows 95 or Windows NT operating system
- 500 Mb hard disk (recommended)
- 16 Mb RAM (more memory may be required to run Windows NT)
- VGA monitor
- For the Ethernet option, the PC requires an Ethernet card and networking hardware (cabling, hub, etc.). See section A.4 on page 64 for details.
- For the serial option, the PC requires an open serial port and a DB9 (female) to DB9 (male) serial pass-thru cable. See section A.3 on page 63 for details.

Adept MV Controller Requirements

To use the Ethernet interface, the Adept controller requires a 68040 processor and the AdeptNet option.

For the serial option, a serial link between the PC and either the Adept 68030 or 68040 processor is required. This link uses the RS232 serial port located on the Adept processor board.

> **NOTE:** The AdeptVision image is not supported by the serial option. However, vision graphics are displayed on the PC.

V+ version 12.0 (or later) is required to use the AdeptWindows PC GUI.

In addition, AdeptWindows PC requires that the AdeptWindows license be installed on *each* controller it is to be used with. See Table 1 for more information on the software configuration.

Table 1
Software Requirements

AdeptWindows Program	Serial Link	AdeptNet (Ethernet)	Adept Windows License	AIM 3.1	V+ 12.x	V+ 11.x	V+ 10.x	V+ 8.x
AdeptWindows PC	*	*	✔	*	✔			
AdeptWindows DDE	NA	✔	NA	✔	*	11.2 or later		
AdeptWindows OffLine Editor	NA	NA	NA	NA	*	*	*	*

✔ Program requires this item
* Program works with this item
NA Not Applicable

Software Installation

Appendix A covers installing the AdeptWindows software on your PC.

Do I Have to Read All the Manuals?

This manual covers the basics of using AdeptWindows. However, to install AdeptWindows, you also need to be familiar with the Adept MV controller and your PC. Therefore, you should read the manuals listed in Table 2. You can ignore the manuals in Table 3 unless you are programming or customizing your system.

Table 2
Manuals You Should Read or Review

Manual	Material Covered
Personal Computer User's Guide	This manual should describe the basics about your PC. You should be familiar with the hardware/software configuration of your PC.
Adept MV Controller User's Guide	Basics of using the Adept controller.
Instructions for Adept Utility Programs	Instructions for running the different Adept utility programs. Depending on which options you use, you may have to run different Adept utility programs. Keep the manual handy for instructions on any utility programs you may have to run.
AdeptNET User's Guide	Instructions for installing the AdeptNET option on the Adept MV controller.

Table 3
Manuals Used for Custom Programming

Manual	Material Covered
V+ Language User's Guide	This manual covers the basic V+ system. If you plan to use the AdeptWindows Offline Editor, read this manual.
V+ Language Reference Guide	This set of reference manuals covers the language in which all V+ and AIM programs are written. If you plan to use the AdeptWindows Offline Editor to write custom V+ or AIM code, you should keep this manual handy for reference.

How Do I Begin?

Before you can use AdeptWindows, you must complete the following steps:

- Install the Adept controller (see the controller user's guide).
- Install the PC (see the PC user's guide).
- Install AdeptWindows (see Appendix A).
- Install the AdeptWindows license (see Appendix A).
- Set up a serial or Ethernet connection (see Appendix A).
- Start up the AdeptWindows program(s) (see Chapter 1).

How Can I Get Help?

The following section tells you who to call if you need help.

Within the Continental United States

Adept Technology maintains a Customer Service Center at its headquarters in San Jose, CA. The phone numbers are:

Service Calls

(800) 232-3378 (24 hours a day, 7 days a week)
(408) 433-9462 FAX

> **NOTE:** When calling with a controller-related question, please have the serial number of the controller. If your system includes an Adept robot, also have the serial number of the robot. The serial numbers can be determined by using the ID command (see the *V+ Operating System User's Guide*).

Application Questions

If you have an application question, you can contact the Adept Applications Engineering Support Center for your region:

Adept Office	Phone #, Hours	Region
San Jose, CA	Voice (408) 434-5033 Fax (408) 434-6248 8:00 A.M. – 5:00 P.M. PST	Western Region States: AR, AZ, CA, CO, ID, KS, LA, MO, MT, NE, NM, NV, OK, OR, TX, UT, WA, WY
Cincinnati, OH	Voice (513) 792-0266 Fax (513) 792-0274 8:00 A.M. – 5:00 P.M. EST	Midwestern Region States: AL, IA, IL, IN, KY, MI, MN, MS, ND, West NY, OH, West PA, SD, TN, WI
Southbury, CT	Voice (203) 264-0564 Fax (203) 264-5114 8:00 A.M. – 5:00 P.M. EST	Eastern Region States: CT, DE, FL, GA, MD, ME, NC, NH, MA, NJ, East NY, East PA, RI, SC, VA, VT, WV

Applications Internet E-Mail Address

If you have access to the Internet, you can send application questions by e-mail to:

applications@adept.com

This method also enables you to attach a file, such as a portion of V+ program code, to your message.

NOTE: Please attach only information that is formatted as text.

Training Information

For information regarding Adept Training Courses in the USA, please call (408) 434-5024.

Within Europe

Adept Technology maintains a Customer Service Center in Dortmund, Germany. The phone numbers are:

(49) 231 / 75 89 40 from within Europe (Monday to Friday, 8:00 A.M. to 5:00 P.M.)
(49) 231 / 75 89 450 FAX

France

For customers in France, Adept Technology maintains a Customer Service Center in Massy, France. The phone numbers are:

(33) 1 69 19 16 16 (Monday to Friday, 8:30 A.M. to 5:30 P.M., CET)
(33) 1 69 32 04 62 FAX

Outside Continental United States or Europe

For service calls, application questions, and training information, call the Adept Customer Service Center in San Jose, California USA:

1 (408) 434-5000
1 (408) 433-9462 FAX (service requests)
1 (408) 434-6248 FAX (application questions)

Adept Bulletin Board Service

Adept maintains a bulletin board service (BBS) for customer use. The BBS number is (203) 264-5590. Application utility programs and helpful hints are posted to this bulletin board, and Adept customers may post their own hints and application notes. There is no charge for access to the Adept bulletin board. (You will, of course, incur normal long-distance phone charges for the call to the BBS.) The first time you call the BBS, you will be able to set up an account right from the BBS. For questions about the BBS, call (800) 232-3378.

Adept Web Page

If you have access to the Internet, you can view Adept's web page at the following address:

http://www.adept.com

The web site contains an array of sales, customer service, and technical support information.

AdeptWindows PC Display Interface 1

1.1 Introduction

The AdeptWindows PC display interface (AdeptWindows PC) allows direct communication between your PC and the Adept controller. With AdeptWindows PC running on your PC, you can operate the Adept controller from your PC using the same commands and keystrokes that you would use with the Adept keyboard and VGA monitor.

1.2 Starting AdeptWindows PC

To start AdeptWindows PC from the Windows 95 Program Manager:

Start ➡ Programs ➡ Adept ➡ AdeptWindows PC

The AdeptWindows PC introductory screen is displayed followed by the **Connection type** dialog box:

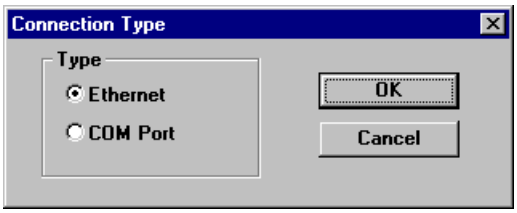


Figure 1-1
Connection Type Dialog Box

Select the connection type: either Ethernet or a COM port (serial connection). Choose **OK** to save the selection.

> **NOTE:** The system "remembers" your connection preference. It prompts you appropriately the next time you try to connect.

Connecting Through Ethernet

If you selected "Ethernet", the following dialog box is displayed:

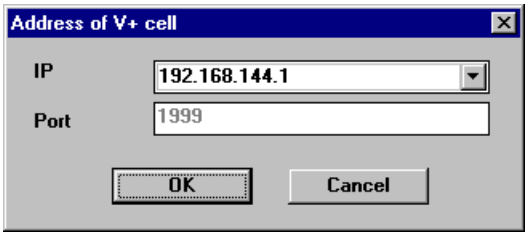


Figure 1-2
V^+ Cell Address Dialog Box

In the IP field, type the IP address (or host name) for the Adept controller. This should be the same address used when you PINGed the controller during installation. See Appendix A for details.

> **NOTE:** If you do not know what IP addresses are available, you can select **File ➡ Scan Ethernet** to display a list of IP addresses of Adept MV controllers that support AdeptWindows PC on your network.

Connecting Through a COM Port

If you selected “COM Port”, the following dialog box is displayed:

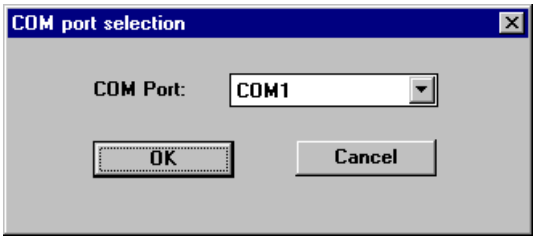


Figure 1-3
COM Port Selection Dialog Box

Use the scrolling COM Port list to select the appropriate COM port. This should be the PC COM port that the serial cable is connected to. See Appendix A for details.

The AdeptWindows PC Main Window

If the controller is booted and waiting, the communication should happen immediately (within 1-2 seconds) after you choose **OK**. When communication begins, the AdeptWindows PC window, shown in Figure 1-4, expands to fill the entire PC screen.

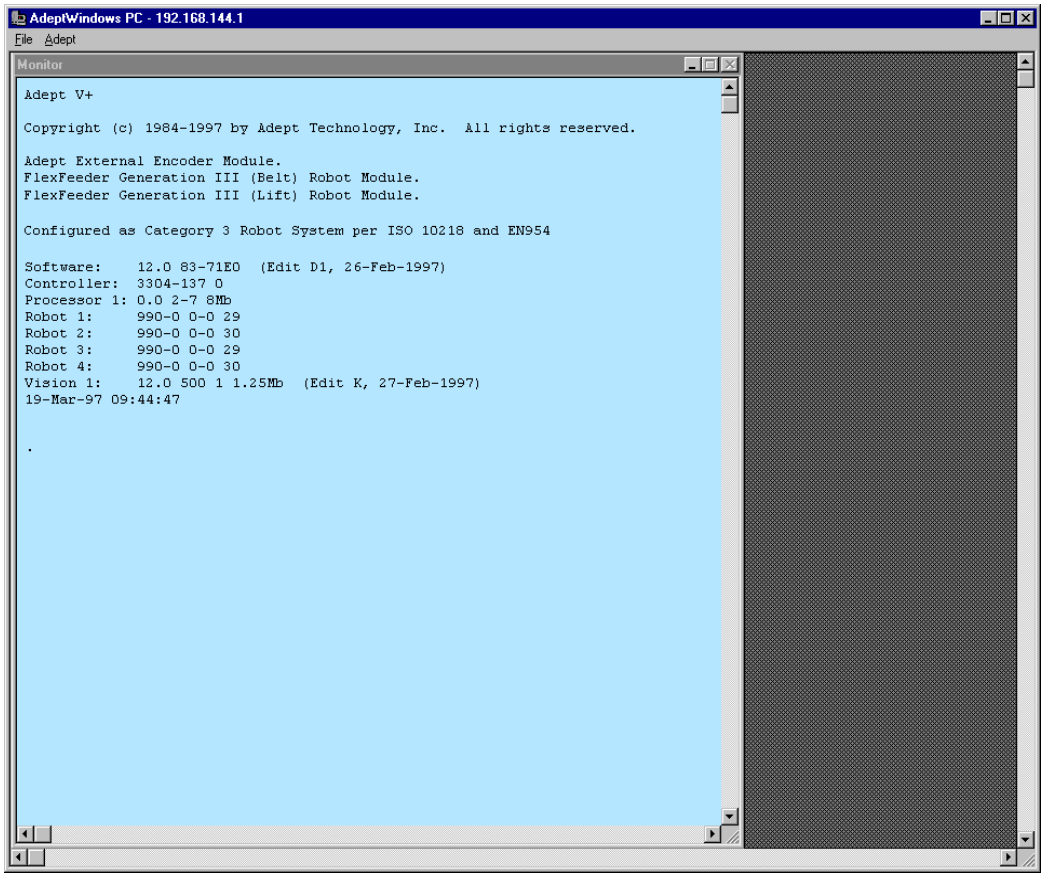


Figure 1-4
AdeptWindows PC Main Window

You can reduce the window size by double-clicking on the AdeptWindows PC menu bar or:

File ➡ Normal Size

Once the window is opened, you can execute Monitor commands, use the SEE editor, or start up an AIM module (MotionWare, VisionWare, etc.).

You also can perform file transfers between the Adept controller disk drives and the PC disk drives. This allows you to write and edit programs on the PC (using the AdeptWindows Offline Editor) and then transfer them to the Adept controller using AdeptFTP or AdeptNFS. See Chapter 3 for details on the AdeptWindows Offline Editor. See the *Instructions for Adept Utility Programs* manual for details on the AdeptFTP client/server utility. See the *AdeptNET User's Guide* for details on AdeptNFS software.

NOTE: File transfers also require that File Transfer Protocol (FTP) or Network File System (NFS) software be running on the PC. FTP software (shareware versions) can be downloaded from the Internet. Also, Windows 95 contains an FTP program that can be accessed by typing FTP at the MS-DOS prompt (or type FTP ? for a list of commands). NFS software can be purchased from software retailers.

1.3 Disconnecting From the Adept Controller

In certain situations, you may wish to disconnect from the current Adept controller, and then connect to a different Adept controller without exiting AdeptWindows PC. To disconnect from the Adept controller:

File ➡ Disconnect

The following message is displayed:

Figure 1-5
Disconnecting From the Adept Controller

Choose **Yes** to disconnect. You can now reconnect to a different Adept controller by following the procedure described in “Connecting Through Ethernet” on page 18 or “Connecting Through a COM Port” on page 19.

1.4 Exiting AdeptWindows PC

To exit AdeptWindows PC:

File ➡ Exit

The following message is displayed:

Figure 1-6
Exiting AdeptWindows PC

Choose **Yes** to exit.

NOTE: If you are still connected to the Adept controller, the message shown in Figure 1-5 is displayed. Follow the procedure in section 1.3 to disconnect from the Adept controller.

The Windows 95 or Windows NT desktop is displayed.

AdeptWindows DDE 2

2.1 Introduction

This section describes the operation of AdeptWindows DDE.

Dynamic Data Exchange (DDE) is a protocol defined by Microsoft for data exchange between different tasks running under Windows 95. AdeptWindows DDE allows a PC application to access data on a V+ controller that is running AIM 3.1.

AdeptWindows DDE consists of two major parts:

PC — An application that runs on the PC and acts as a DDE server to DDE client programs on the same PC. This application forwards messages to the V+ controller using a TCP/IP link over Ethernet.

V+ — A driver task that runs on the V+ controller under AIM 3.1. This task receives messages from the DDE server and accesses V+ and AIM variables to provide data items as requested.

2.2 Starting AdeptWindows DDE

This section describes how to start AdeptWindows DDE.

From the Windows 95 Program Manager

To start AdeptWindows DDE from the Windows 95 Program Manager:

Start ➡ Programs ➡ Adept ➡ AdeptWindows DDE

Or, from the AdeptWindows PC menu bar:

File ➡ Start AdeptDDE

The following window is displayed:

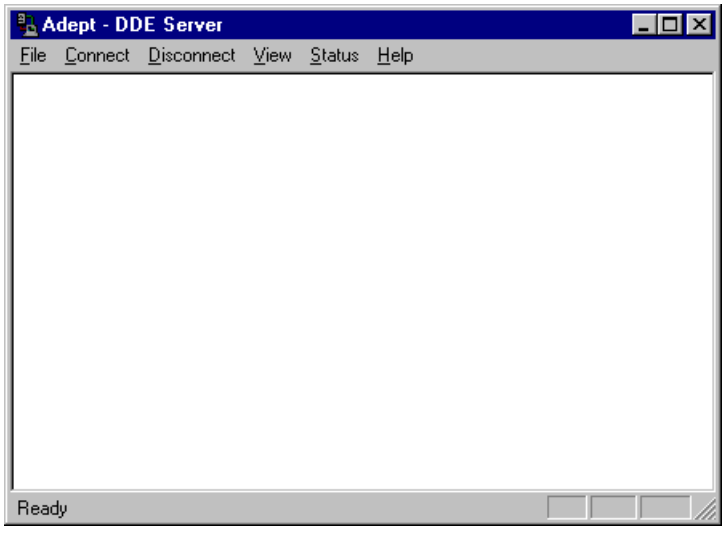


Figure 2-1
AdeptWindows DDE Main Window

The AdeptWindows DDE window has six menus:

- File
- Connect
- Disconnect
- View
- Status
- Help

See section B.2 on page 73 for details.

From the MS-DOS Prompt

To start AdeptWindows DDE from the MS-DOS prompt using the following command:

```
<path>adept nodename
```

where

`<path>` This is the full path name to the directory where the file ADEPT.EXE is located.

`adept` This executes the file ADEPT.EXE.

`nodename` This is the name of the DDE host (see section 2.3).

For example, if the file ADEPT.EXE is located in the subdirectory C:\ADEPTWINDOWS\PROGRAMS and the DDE host name is USER1, you must type:

```
c:\adeptwindows\program\adept user1
```

2.3 Defining, Modifying, or Deleting a V+ Host

The Adept V+ Hosts dialog box is used to define, modify, or delete a V+ host. To display the Adept V+ Hosts dialog box:

File ➡ Hosts

The following window is displayed:

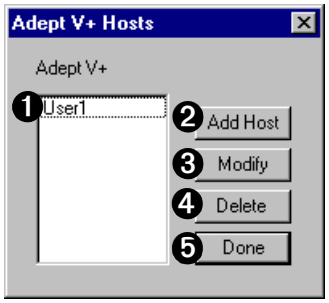


Figure 2-2
List of Defined Hosts

❶ This item displays a list of the current (defined) V+ host.

NOTE: The name "User1" is shown only as an example. The name(s) displayed on your system will depend on the host name(s) that you have defined.

❷ Choose **Add Host** to define a new host. The Define Adept Host dialog box is displayed:

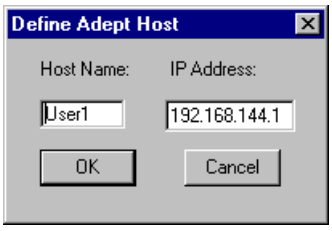


Figure 2-3
Define Adept Hosts

Enter the host name in the **Host Name** field and the corresponding IP address in the **IP Address** field. You must enter the IP address in decimal format (e.g., 192.168.144.1).

❸ Choose **Modify** to modify an existing host's content. The Define Adept Host dialog box is displayed (see item ❷).

❹ Choose **Delete** to delete an existing host.

❺ Choose **Done** to return to the main window.

2.4 Connecting to the Adept Controller

To connect to the Adept controller (host):

1. Start AIM on the Adept controller.

   NOTE: The DDE driver must be enabled. See section 2.6 and section A.5 for details.

2. From the AdeptWindows DDE main menu on the PC, choose Connect. The Connect to Host dialog box is displayed:

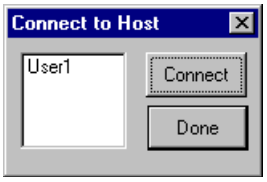


Figure 2-4
Connecting to Host

3. Select the desired host from the list.

   NOTE: If you are not sure about the IP address of a host, double-click on the name to display the host information.

4. Choose **Connect** to make the connection. Once a host is connected to V+, the name is removed from the connect list and placed on the disconnect list in the Disconnect From Host dialog box. See section 2.5 on page 27 for details.
5. Choose **Done** to close the dialog box and return to the main menu.

Once you set up the host name and connect to a V+ host, you can basically ignore the AdeptWindows DDE server until you are ready to disconnect the PC from V+.

2.5 Disconnecting From the Adept Controller

To disconnect from an Adept controller (host):

1. Choose Disconnect from the main menu. The Disconnect From Host dialog box is displayed:

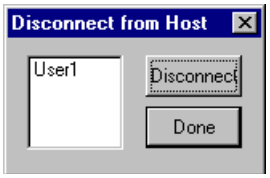


Figure 2-5
Disconnecting From Host

2. Select the desired host from the list.
3. Choose **Disconnect** to disconnect from the host. The host name is removed from the Disconnect From Host list and placed on the Connect to Host list. See section 2.4 on page 27 for details.

NOTE: You must select the desired host before choosing the Disconnect button; otherwise, an error is reported.

4. Choose **Done** to close the dialog box and return to the main menu.

2.6 Running the DDE Driver on the V+ Controller

The DDE driver is part of the DDE module included in the AIM Baseline package. It is enabled using the Initialization Data setup menu in AIM. See section A.5 on page 68 for details. Also see the *MotionWare User's Guide*.

Once it is enabled, the DDE driver loads automatically when AIM is started. It executes as a separate task and uses negligible CPU time until it is accessed by the AdeptWindows DDE server through the network.

2.7 Specifying DDE Item Names

The DDE data format is a triplet: an application name, a topic name, and an item name. For the AdeptWindows DDE server, the application name is "Adept"; the topic name is mapped to a V+ controller name that is defined by the "Hosts" pull-down in the AdeptWindows DDE File menu. See section 2.3 on page 26 for details.

The item name identifies a V+ system item or an AIM variable. It consists of a number of names or numbers delimited by "\" (backslash without quotes) characters. Currently, all item names must begin with one of the following:

sys\ Specifies a V+ system data item.

aim\ Specifies an AIM variable database item.

For example, the item name "sys\controller_serial_number" returns the serial number of the V+ controller.

The system names are defined in the DDE initialization database, DDEINI.DB, which may be modified as desired. The system names refer to V+ expressions with optional arguments. You can use up to three different arguments in each expression. The values of the three optional fields following the argument name are substituted into the V+ expression in place of dummy parameters "#1", "#2", and "#3".

For example, the item name "sys\switch\robot\1" is defined as the V+ expression:

```
switch(#1[#2])
```

In this example, "robot" is the first argument, and "1" is the second argument.

AIM variables are specified as: "aim\module\variable" where "module" is the name of a loaded (but not necessarily selected) resource module, and "variable" is the name of a Variable database record in that module. If "module" is omitted (as in "aim\\variable"), the global Variable database is accessed.

2.8 Hot and Cold Links

A DDE client can ask for a data item to be accessed once and its value returned. This access is called a "cold link". Alternatively, the client can ask that a data item value be sent every time it changes. This access is called a "hot link". To implement hot links, the V+ DDE driver polls the values of hot link items periodically.

In the current implementation, all “sys\” items may have their polling time set in the BASEINI.DB record. All “aim\” items in the Variable database allows you to set the polling time and control read-write access for all AIM variables. To minimize system overhead, static data items (such as “controller_serial_number”) should have the polling time set to zero (do not poll).

> **NOTE:** Even if the polling interval is set to zero, AIM variable values are always sent to the client whenever they are changed by an AIM SET or SETS statement, or by an AIM menu page. Therefore, to improve efficiency, always use a polling interval of zero for AIM variables unless they are being changed by some other method.

2.9 Getting DDE Status Information

AdeptWindows DDE provides a convenient way of monitoring the status of your DDE connections and links. This can be useful if you are gathering information from multiple hosts (controllers) and have multiple links established with each one.

To obtain DDE status information:

Status ➡ Connections...

Status ➡ Links

A status window is displayed:

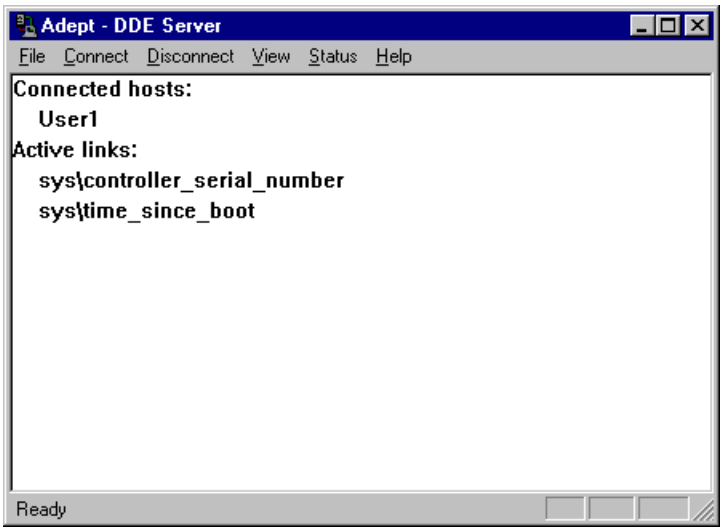


Figure 2-6
DDE Status Window

The window lists the names of all connected hosts and all active links. Once the window is opened, the information is dynamically updated as connections and links are established or terminated.

> **NOTE:** You can view only the connected hosts or only the active links by selecting just the item you want to display from the Status menu. (A check mark is displayed next to the item to indicate that it is being displayed in the window.)

2.10 Customizing DDE in AIM

All DDE records are stored in the DDE initialization database (DDEINI.DB). Once the DDE driver is enabled, the DDE initialization database automatically appears on the list of available databases on the Select Initialization Database page:

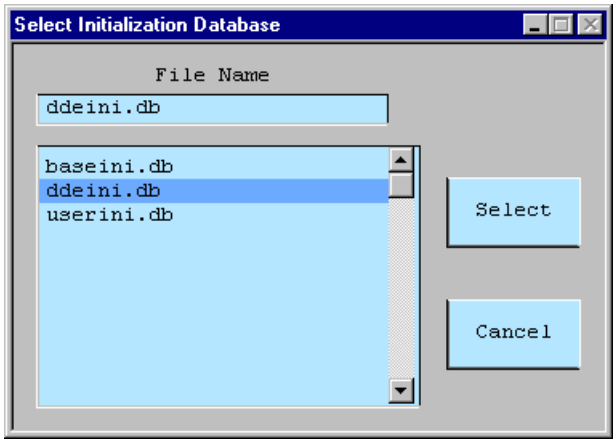


Figure 2-7
Select Initialization Database Page

> **CAUTION:** The DDE initialization records control the interaction between the Adept DDE driver and other DDE applications. Therefore, it is recommended that you have a good understanding of DDE, AIM customizing, and your application before attempting to create or modify DDE initialization records.

Modifying DDE Records in AIM

To modify the records in the DDE initialization database:

Setup ➡ Initialization Data ➡ ***double-click "ddeini.db"***

Select ➡ Index ➡ ***double-click record name***

Once the record is opened, you can change the values on the record page. The changes are saved automatically when the record page is closed.

Creating New DDE Records in AIM

You can now create records that outline specific V+ functions and / or V+ variables that you want to write to the AdeptWindows DDE server task on the PC. There are nine predefined DDE records included in AIM. The function of each record is fully described in the record's **Description** field. You can copy and edit one of the existing records or create a new record. (The steps below use the copy and edit method.)

To create a new DDE record:

Special ➡ Edit Init Data ➡ ***double-click "ddeini.db"***

Edit ➡ Copy
Edit ➡ Paste

The following record page is displayed:

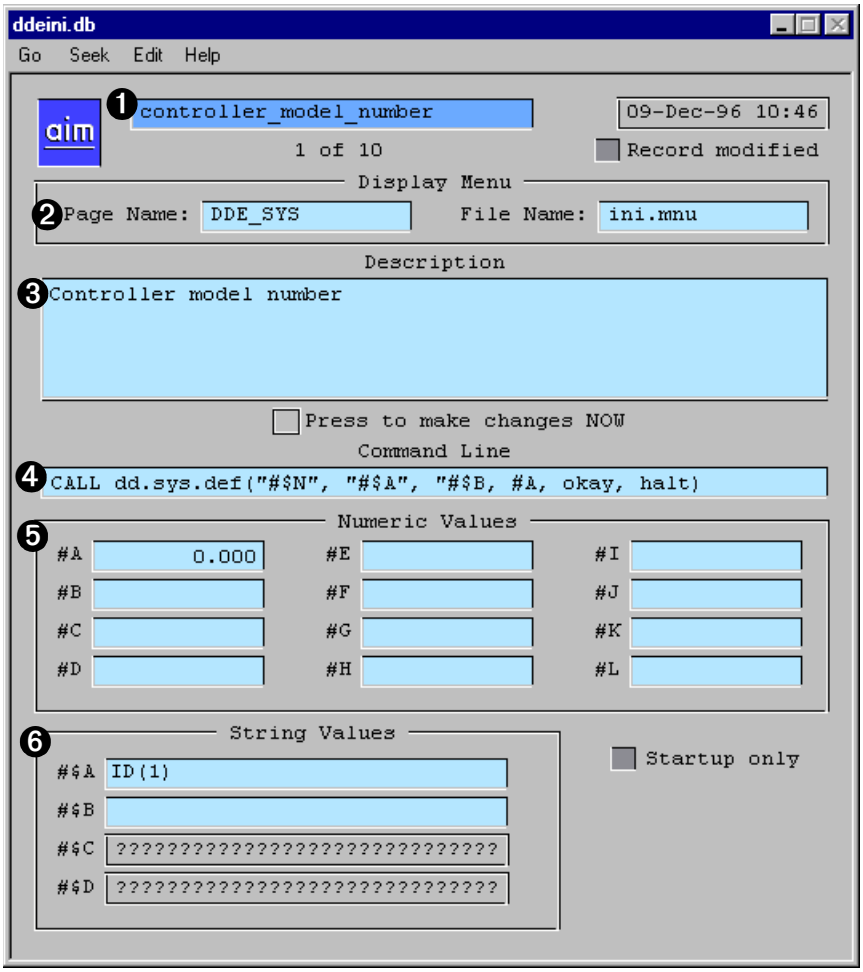


Figure 2-8
DDEINI.DB Record Page

To edit the fields on the new record page, select the desired field and enter the information. See the section titled “Customizing Initialization Databases” in the *AIM Customizer’s Reference Guide* for details. The following information must be entered:

1. Enter the name in item ❶ that will be used by the DDE client to refer to this record. The name must contain only alphanumeric characters and underscores.
2. Verify the information in item ❷. The **Page Name** field must contain “DDE.SYS”. The **File Name** field must contain “ini.mnu”.
3. Enter a description for the record page in item ❸.
4. Verify that the **Command Line** field (item ❹) contains the information shown in Figure 2-8.
5. Set the **#$A** field in item ❺ to zero or blank. All other fields in this group should be blank..
6. Set all fields in item ❻ to blank.

After the record is created, you must also create a definition as shown in the following section.

> **NOTE:** Once the record is saved, you can edit the values on the record. See "Modifying DDE Records in AIM" on page 31 for details.

Defining the V+ Expression Associated With the DDE Record

Once the DDE record is created (see the section above) you must define the V+ expression that will be associated with that record.

To define the V+ expression:

Setup ➡ Initialization Data ➡ *double-click "ddeini.db"*

Seek ➡ Index ➡ *double-click the record name created in the previous section*

The following window is displayed:

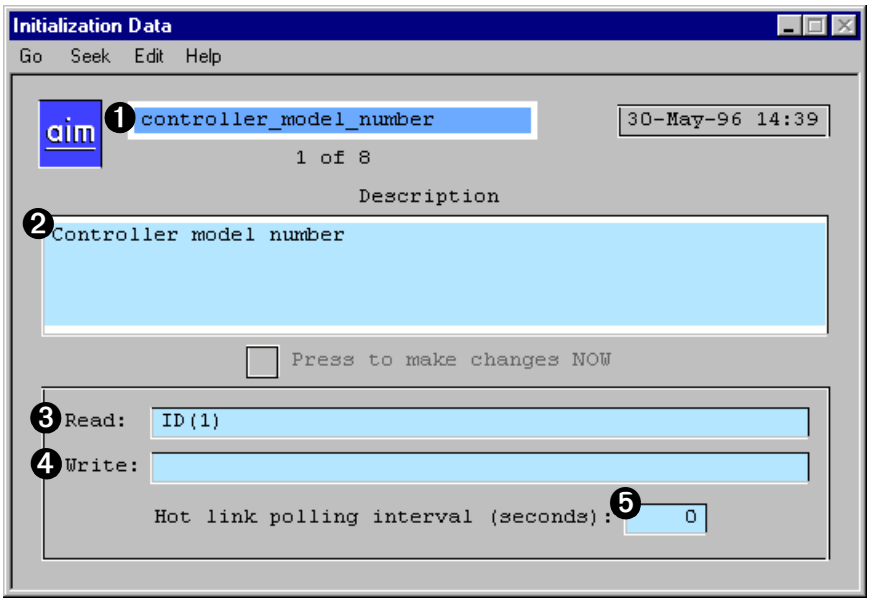


Figure 2-9
DDE Initialization Data Definition

1. Enter the name in item ❶ that will be used by the DDE client to refer to this record. The name must contain only alphanumeric characters and underscores.

   > **NOTE:** This name is not used by the expressions defined in items ❸ or ❹.

2. Check the description contained in item ❷ (you may change it, if needed). This text comes from the description entered in Figure 2-8, item ❸.

3. Enter a V+ string or real-valued expression in item ❸ that evaluates to the data associated with reading the DDE item. If the expression begins with a double quote (") or a dollar sign ($), the expression is assumed to be a string value. Otherwise, it is assumed to be a real value.

   When this expression is evaluated, any arguments of the form #1, #2, or #3 are replaced by additional "\" arguments found in the request from the DDE client.

4. This field in item ❹ is optional. If blank, this DDE item cannot be written. If non-blank, it must be a V+ global variable name of the same type as the expression in item ❸. This variable occurs on the left side of an equal (=) sign in an assignment operation. Array variables are permitted and may contain #1-type arguments.

   When this expression is evaluated, any arguments of the form #1, #2, or #3 are replaced by additional "\" arguments found in the request from the DDE client.

5. Set the optional polling time by entering a value in the **Polling time** field (item ❺). For example, if you enter 5, the information is updated every five seconds.

Creating Variable Records

You also can create variables in the Variables database in AIM 3.1 that can be accessed (read / write) through the DDE link. These variables may be of any type available to the Variables database records. See the section titled "Variable Database" in the *MotionWare User's Guide* for details on creating Variable records.

Once a Variables database record is created, you can control DDE access to the record using the DDE Access options:

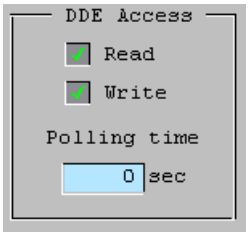


Figure 2-10
DDE Access Selection for Variable Records

Select ☑ **Read** to set up the Variable record for read access using DDE.

Select ☑ **Write** to set up the Variable record for write access using DDE.

> **NOTE:** The Write check box is available only when the Read check box is selected.

Set the polling time for the variable by entering a value in the **Polling time** field. For example, if you enter 5, the information is updated every five seconds.

> **NOTE:** A polling time of zero means that the information is updated only when it changes (see the note in section 2.8 on page 29). This is useful for items that never change, such as constants, ID numbers, number of robots, etc.

2.11 DDE Examples

This section contains several DDE examples that you can experiment with on your system.

Reading Data Using Microsoft Excel

Microsoft Excel provides a good example of using DDE to read data. Below are several examples that you can experiment with to see how DDE operates.

> **NOTE:** The following examples assume that you have defined the V+ host as "User1". If not, simply substitute your host name where "User1" appears.

For an example of a static item:

1. Start Microsoft Excel.
2. Select any empty cell and type:

   ```
   =Adept|User1!sys\controller_serial_number
   ```

3. Press the Enter key. The cell displays the serial number of the Adept controller.

For an example of a dynamic item:

1. Start Microsoft Excel
2. Select any empty cell and type:

   ```
   =Adept|User1!sys\time_since_boot
   ```

3. Press the Enter key. The cell displays the time that has elapsed since the controller was booted. Continue watching the screen to see the time update automatically.

> **NOTE:** The "|" and "!" characters are delimiters for the application name, topic name, and item name. "User1" represents a host name that you defined in the AdeptWindows DDE server. See section 2.7 on page 28 for details on the item name format.

Reading and Writing Data Using a Microsoft Excel Macro

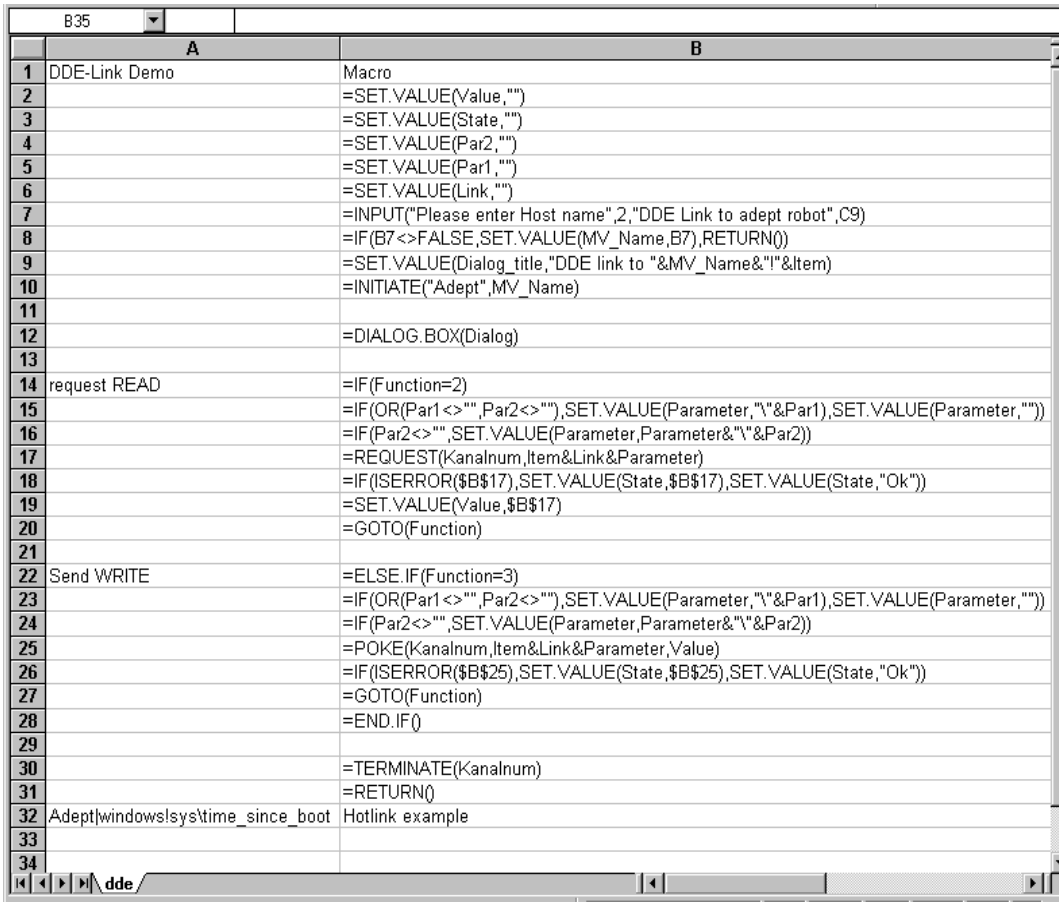
The following example creates a Microsoft Excel macro that allows you to read and write data using DDE.[1] When this macro is executed, it links to a specified DDE host and then displays a window that allows you to read from and write to various items on the Adept controller.

> **NOTE:** This example assumes that you are already familiar with Microsoft Excel and how to create macros for Excel.

Creating the Macro

1. Start Microsoft Excel
2. Copy the following code into the corresponding cell addresses on the worksheet

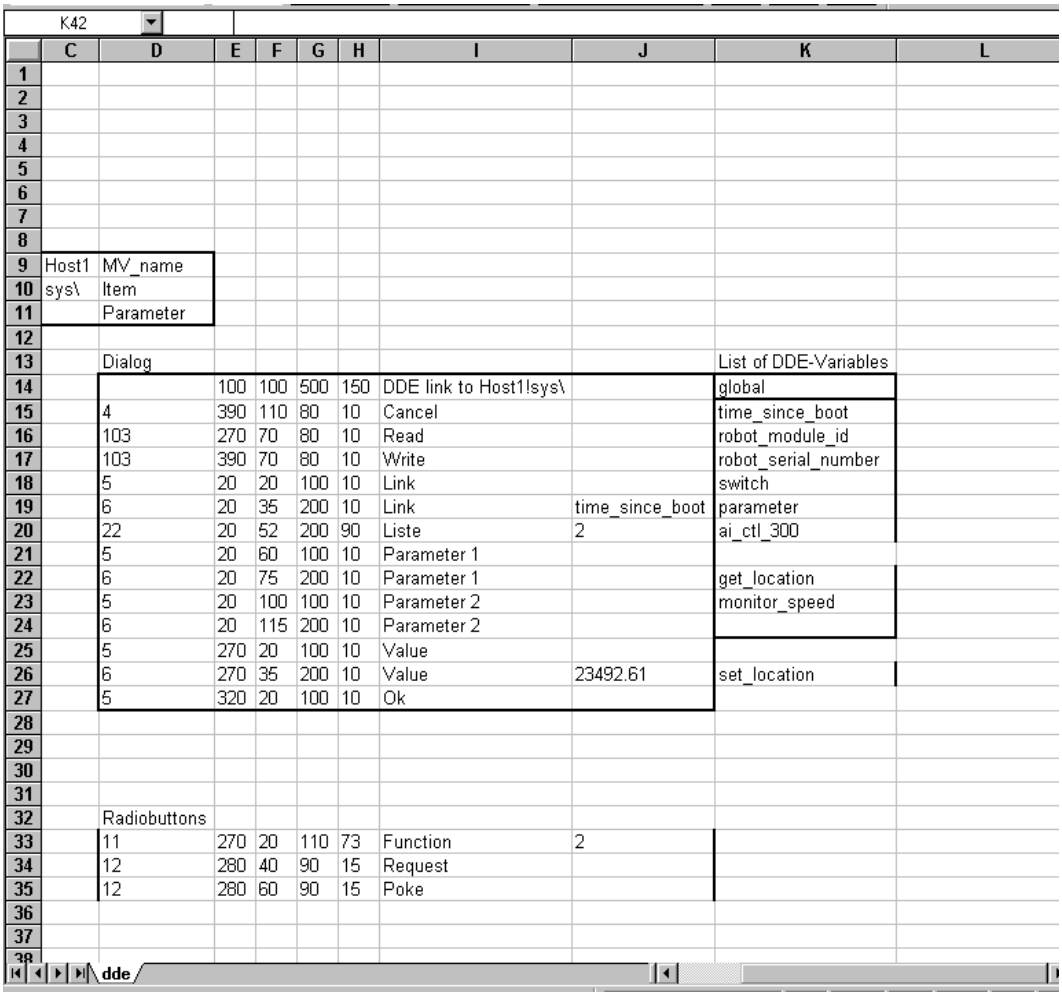
[1] Microsoft Excel does not support writing data using DDE directly from a spreadsheet. To write data, you must create an Excel macro or use a different PC application such as Visual Basic™.



B35

	A	B
1	DDE-Link Demo	Macro
2		=SET.VALUE(Value,"")
3		=SET.VALUE(State,"")
4		=SET.VALUE(Par2,"")
5		=SET.VALUE(Par1,"")
6		=SET.VALUE(Link,"")
7		=INPUT("Please enter Host name",2,"DDE Link to adept robot",C9)
8		=IF(B7<>FALSE,SET.VALUE(MV_Name,B7),RETURN())
9		=SET.VALUE(Dialog_title,"DDE link to "&MV_Name&"!"&Item)
10		=INITIATE("Adept",MV_Name)
11		
12		=DIALOG.BOX(Dialog)
13		
14	request READ	=IF(Function=2)
15		=IF(OR(Par1<>"",Par2<>""),SET.VALUE(Parameter,"\"&Par1),SET.VALUE(Parameter,""))
16		=IF(Par2<>"",SET.VALUE(Parameter,Parameter&"\"&Par2))
17		=REQUEST(Kanalnum,Item&Link&Parameter)
18		=IF(ISERROR($B$17),SET.VALUE(State,$B$17),SET.VALUE(State,"Ok"))
19		=SET.VALUE(Value,$B$17)
20		=GOTO(Function)
21		
22	Send WRITE	=ELSE.IF(Function=3)
23		=IF(OR(Par1<>"",Par2<>""),SET.VALUE(Parameter,"\"&Par1),SET.VALUE(Parameter,""))
24		=IF(Par2<>"",SET.VALUE(Parameter,Parameter&"\"&Par2))
25		=POKE(Kanalnum,Item&Link&Parameter,Value)
26		=IF(ISERROR($B$25),SET.VALUE(State,$B$25),SET.VALUE(State,"Ok"))
27		=GOTO(Function)
28		=END.IF()
29		
30		=TERMINATE(Kanalnum)
31		=RETURN()
32	Adept|windows|sys\time_since_boot	Hotlink example
33		
34		

dde



	C	D	E	F	G	H	I	J	K	L
1										
2										
3										
4										
5										
6										
7										
8										
9	Host1	MV_name								
10	sys\	Item								
11		Parameter								
12										
13		Dialog							List of DDE-Variables	
14			100	100	500	150	DDE link to Host1!sys\		global	
15		4	390	110	80	10	Cancel		time_since_boot	
16		103	270	70	80	10	Read		robot_module_id	
17		103	390	70	80	10	Write		robot_serial_number	
18		5	20	20	100	10	Link		switch	
19		6	20	35	200	10	Link	time_since_boot	parameter	
20		22	20	52	200	90	Liste	2	ai_ctl_300	
21		5	20	60	100	10	Parameter 1			
22		6	20	75	200	10	Parameter 1		get_location	
23		5	20	100	100	10	Parameter 2		monitor_speed	
24		6	20	115	200	10	Parameter 2			
25		5	270	20	100	10	Value			
26		6	270	35	200	10	Value	23492.61	set_location	
27		5	320	20	100	10	Ok			
28										
29										
30										
31										
32		Radiobuttons								
33		11	270	20	110	73	Function	2		
34		12	280	40	90	15	Request			
35		12	280	60	90	15	Poke			
36										
37										
38										

3. Save the worksheet as DDE_RW.XLS.
4. Use Excel's Define Name dialog box to assign names to the cell addresses shown in the following table:

Name	Refers to Cell Address
Dialog	=DDE_RW!$D$14:$J$27
Dialog_title	=DDE_RW!$I$14
Function	=DDE_RW!$B$12
Item	=DDE_RW!$C$10
Kanalnum	=DDE_RW!$B$10
Link	=DDE_RW!$J$19
Liste	=DDE_RW!$K$14:$K$24
menu	=DDE_RW!$B$1

Name	Refers to Cell Address
MV_Name	=DDE_RW!$C$9
Par1	=DDE_RW!$J$22
Par2	=DDE_RW!$J$24
Parameter	=DDE_RW!$C$11
State	=DDE_RW!$I$27
Value	=DDE_RW!$J$26

5. Save the worksheet again.

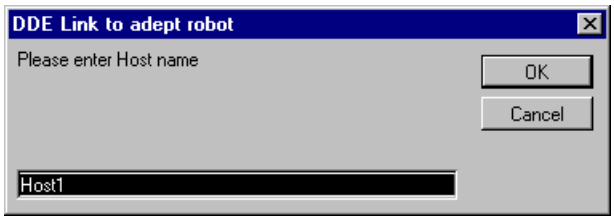
Running the Macro

To run the macro:

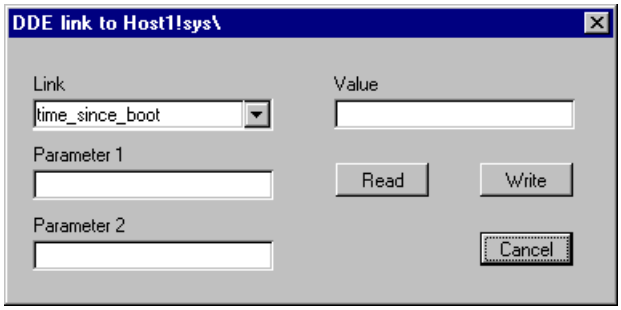
1. Start AdeptWindows PC and connect to the Adept MV controller.
2. Start AdeptWindows DDE and connect to a host.
3. Start Microsoft Excel.
4. Open the file DDE_RW.XLS.
5. Select cell address B1.
6. To start the macro:

   Tools ➡ Macro... ➡ Run

   The following window is displayed:



7. Type the host name (as used in Step 2 above) in the highlighted field and choose **OK**. The following window is displayed:



Reading System Information

To read system information:

1. Scroll to any item in the **Link** field.
2. Choose **Read** to display the value.

Reading or Writing AIM Variable Data

To read AIM Variable database values or write new values to existing variables in the AIM Variable database:

1. Change the data in cell address C10 to:

   ```
   aim\
   ```

2. Restart the macro.
3. Type the variable name in the **Link** field. For example, if you have a global AIM variable named “test”, you would type:

   ```
   \test
   ```

4. Choose **Read** to display the current value of the variable. Or you can enter a new value in the **Value** field and then choose **Write** to write the value to the AIM variable.

AdeptWindows Offline Editor 3

3.1 Introduction

This chapter explains how to use the offline editor provided with AdeptWindows. It is assumed that you are familiar with the Microsoft Windows environment and basic V+ programming.

3.2 Features of the Offline Editor

The AdeptWindows Offline Editor allows you to write and edit V+ programs on your PC. The editor is a comprehensive program development package that runs under Windows 95.

> **NOTE:** You do not have to be connected to the Adept controller to use the AdeptWindows Offline Editor.

The software supports:

- Automatic syntax checking. Syntax errors are trapped and a "?" (question mark without quotes) is inserted at the beginning of the line containing the error.
- Automatic keyword expansion. For example, "ena po" automatically expands to ENABLE POWER.
- Automatic template insertion. When you choose a menu bar icon, the corresponding FOR, IF, CASE, WHILE, DO control constructs templates are inserted at the cursor position. This eliminates unnecessary typing.
- Automatic dynamic indentation for control constructs.
- Customized header templates. A default header template is supplied that is automatically inserted after a .PROGRAM declaration. The header template can be customized for your application.
- Tools for CALL Tree listings and Keyword listings.
- Variable names and instructions are color coded to remind you of their use.
- Multiple files may be opened in separate windows, allowing you to cut and paste information between them.
- Global Find and Replace. These commands may apply to entire files or just one program.
- Retrieve, Goto, Cut, Paste, etc. These commands allow you to share information and navigate between programs.
- Project management tools that allow you to maintain V+ files on the PC.

Restrictions:

- Online and quick syntax help facilities are not available.
- Although indentation is performed, V+ control structures are not validated.
- GOTO labels are not validated.

3.3 Starting the Offline Editor

To start the AdeptWindows Offline Editor:

Start ➡ Programs ➡ Adept ➡ AdeptWindows Offline Editor

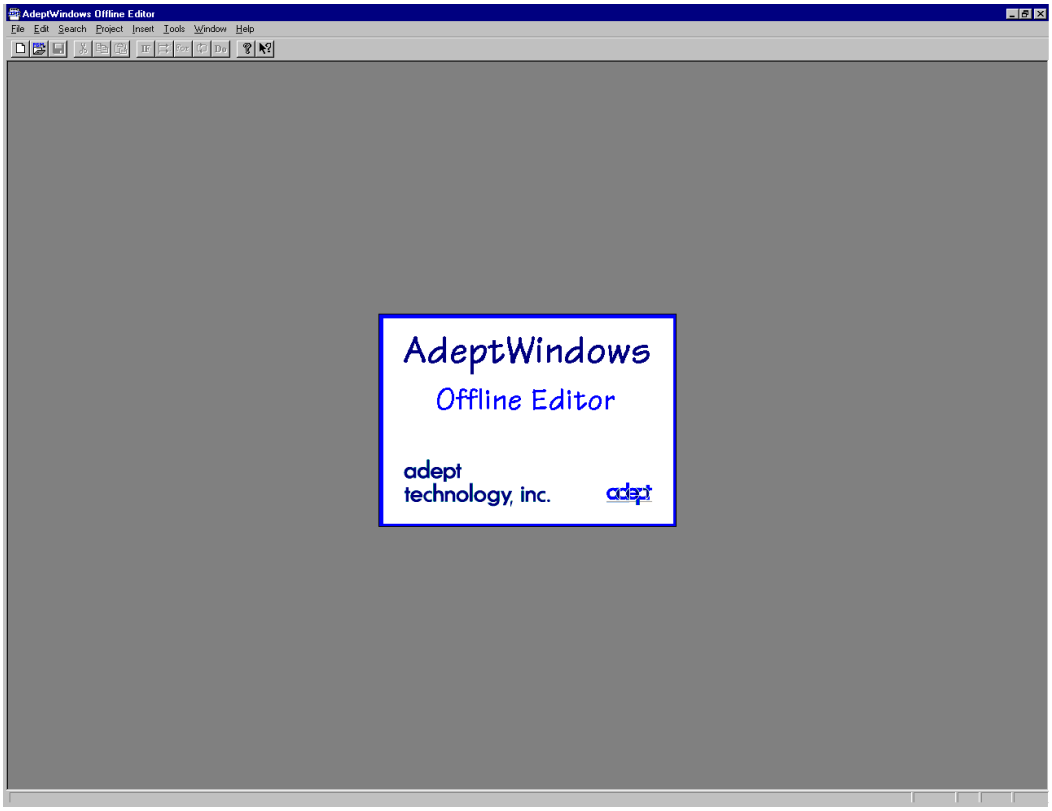


Figure 3-1
Offline Editor Main Window

The editor window expands to the maximum size of the PC monitor screen. You can adjust the size of the window using the icons located at the upper right-hand corner of the window.

3.4 Using the Icons

All of the features of the editor can be accessed using the main menu bar or by clicking on the icon for the desired feature. See section B.3 on page 74 for details on the pull-down menus.

Figure 3-2
Offline Editor Menu / Icon Bar

Description of Icons

- Create a new program file (see page 47)
- Open an existing program file (see page 48)
- Save the current program file to disk
- Cut the selected lines of code to the clipboard (see page 50)
- Copy the selected lines of code to the clipboard (see page 50)
- Paste the cut / copied lines of code from the clipboard (see page 50)
- Insert a new IF structure into the program at the cursor position (see page 50)
- Insert a new CASE structure into the program at the cursor position (see page 50)
- Insert a new FOR structure into the program at the cursor position (see page 50)
- Insert a new WHILE structure into the program at the cursor position (see page 50)
- Insert a new DO structure into the program at the cursor position (see page 50)
- Access the online help system (not available in this release)
- Context-sensitive help (not available in this release)

3.5 Getting Around

When a program file is opened, the first program in the file is displayed. There are several options for moving from one program in the file to another. These options are found under the **Search** pull-down menu.

Find and Replace

The **Find** option allows you to quickly locate a specified text string. To use the **Find** option:

Search ➡ Find...

The following dialog box is displayed:

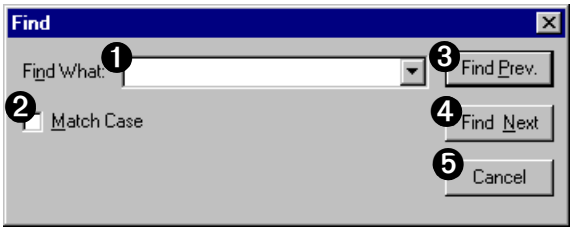


Figure 3-3
The Find Dialog Box

❶ Use the **Find What** field to specify the text to search for. You can match the specified case by selecting item ❷.

❸ Choose **Find Prev.** to individually find each occurrence of the specified text.

❹ Choose **Find Next** to individually find each occurrence of the specified text.

❺ Choose **Cancel** to clear all entries and close the dialog box.

The **Replace** option allows you to quickly locate a specified text string and then replace it with a different (specified) text string. To use the **Replace** option:

Search ➡ Replace...

The following dialog box is displayed:

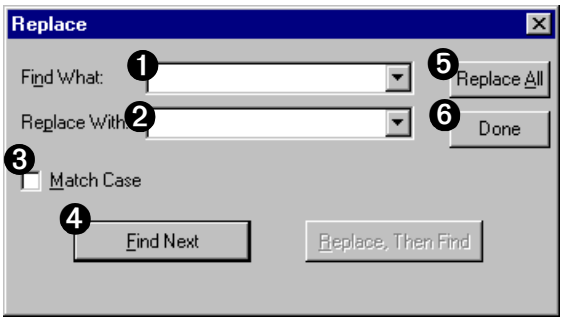


Figure 3-4
The Replace Dialog Box

❶ Use the **Find What** field to specify the text to search for. You can match the specified case by selecting item ❸.

❷ Use the **Replace With** field to specify the new (replacement) text.

❹ Choose **Find Next** followed by **Replace. Then Find** to individually find and replace each occurrence of the specified text.

❺ Choose **Replace All** to find and replace every occurrence of the specified text.

❻ Choose **Done** to close the dialog box.

Goto Program and Previous Program

When the cursor is on a line with a CALL instruction, choose the **Goto Prgm** option (or press Ctrl+G) to open a new window and display the called program. If the cursor is not on a line with a CALL instruction, the editor displays a dialog box that asks you for the program name. The following restrictions apply:

- The called program must be in the open project's file list (see page 52).
- The called program must be open (see page 48).

After using the **Goto Prgm** option, you can use the **Prev. Prgm** option (or press Ctrl+P) to display the previous program.

> **NOTE:** The editor window displays only the previously viewed programs that are contained in the current file. It cannot switch from the current file window back to the previously displayed file window.

Program Pick Lists

Choose the **List All Pgms** option (or press Ctrl+A) to display an alphabetical pick list of all the programs in the file. Double-click one of the programs on the pick list to open that program for editing.

Choose the **List Bad Pgms** option (or press Ctrl+B) to display a pick list of the programs that have syntax errors. Once a program is opened (by double-clicking on the program name) use the **Next Error** menu option (or press Ctrl+E) to locate each error.

Navigate

It is often useful to see the call/caller relationship among different programs in a program file. This is particularly true in a large file containing many programs, or when you are trying to understand a V+ application written by someone else.

Choose **Tools ➡ Navigate** to create an interactive CALL tree.

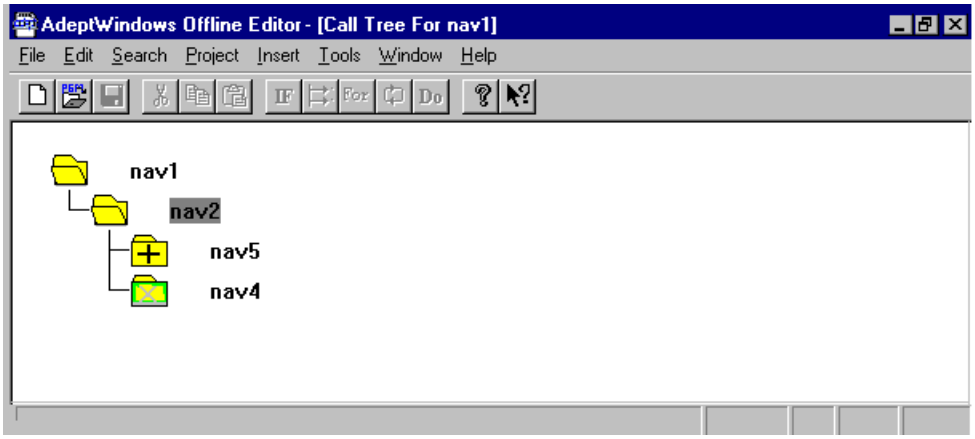


Figure 3-5
Navigate CALL Tree

This option provides an interactive display of the CALL hierarchy of programs in a file. Navigate works only for program files that are open. The CALL relationship is displayed with file icons next to the program names. These icons can be interpreted as follows:

- An open file icon indicates that the branch of the call tree has been expanded.
- A closed file icon indicates that this program is the end of a branch (it calls no other programs).
- A closed file icon with a "+" indicates that this branch is not fully expanded and the program contains calls to other programs that are not displayed.
- A closed file icon with an "x" indicates that this program is not in the current file.

To expand all branches of the CALL tree, choose **Tools ➡ Expand All**.

To open a program for editing, double-click the program name.

To view the original Navigate call tree:

Window ➡ ***click on the Call tree name***

NOTE: Do not use the **Navigate** option to return to the original call tree. This option creates a call tree for the current program. It does not take you back to the original call tree.

3.6 Creating and Editing a Program

The following sections describe how to use the AdeptWindows Offline Editor to create and edit a V+ program.

Creating a New Program File

To create a new program file, choose  or:

File ➡ New File...

The following dialog box is displayed:

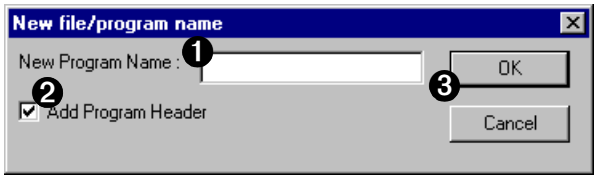


Figure 3-6
New File / Program Name Dialog Box

❶ Enter the new program name in the **New Program Name** field. (The disk file and the program use this name.) The program name must conform to V+ file name restrictions.

❷ Select ☑ **Add Program Header** to insert a program header. See "The Standard Program Header" on page 56 for details.

❸ Choose **OK** to save all entries and close the dialog box, or choose **Cancel** to clear all entries and close the dialog box.

Opening an Existing Program File

To open an existing program file, choose or:

File ➡ Open File...

The following dialog box is displayed:

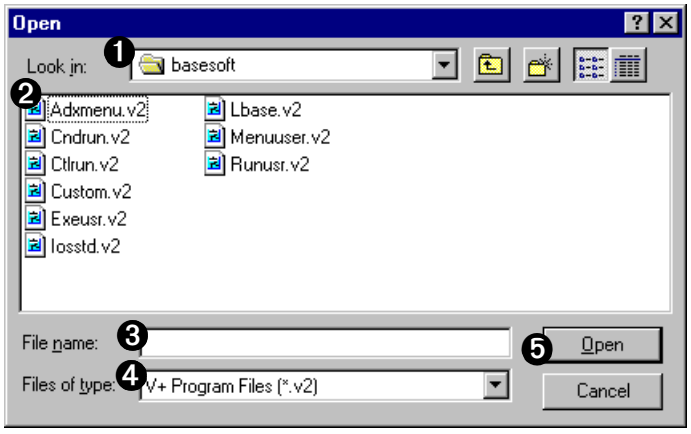


Figure 3-7
Open a Program File

❶ Use this item to locate the drive / directory where the file is stored.

❷ Double-click the desired file name. You also can enter the desired file name in the **File name:** field (item ❸).

❹ Use this item to control the file type(s) displayed in item ❷.

❺ Choose **Open** to display the file. Choose **Cancel** to clear all entries and close the dialog box.

Adding a New Program to an Existing Program File

To add a new program to an existing program file:

Edit ➡ New Pgm...

The New file/program name dialog box is displayed. See page 47 for details.

The Editor Window

The editor window is displayed after you create a new program file or open an existing program file:

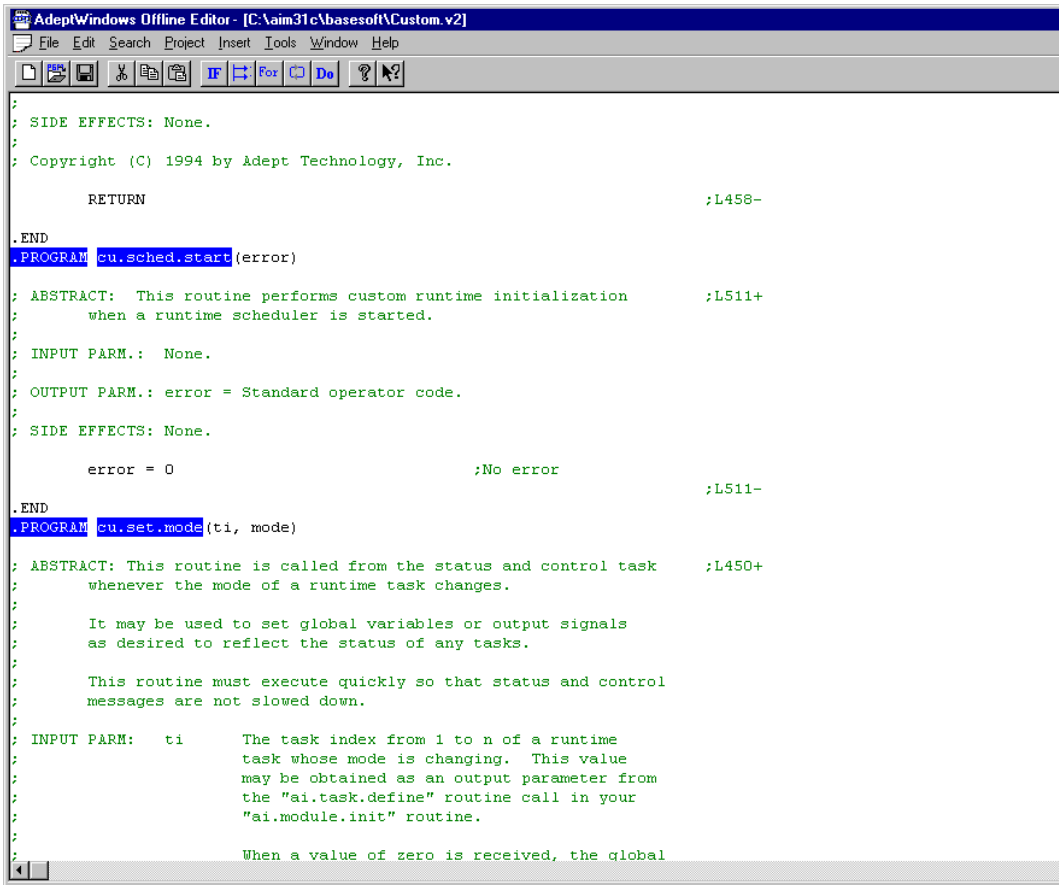


Figure 3-8
Main Program Editing Window

At this point, you can begin typing V+ code just as you would if you were using the SEE editor on the Adept controller. Refer to the *V+ Language User Guide* for information on the SEE editor. Also refer to the *V+ Language Reference Guide* for information on V+ commands.

The AdeptWindows Offline Editor has several “automated” features to assist you:

- It checks the program instructions for the proper syntax as they are entered. If you type an unknown command or use a command incorrectly, the line is flagged with a question mark (?).

- It formats each line with the proper indentation for all logic loops (FOR, WHILE, etc.).
- It color codes variable names, instructions, and comments for easy identification. You can select the color used for each item (see page 57 for details).

You can use the **Insert** menu or icon bar to access a list of options that automatically insert For, While, Do, etc., structures into your programs at the cursor position. See page 75 for a listing and descriptions of these menu options.

Additionally, the **Edit** menu and icon bar includes a list of options, such as Undo, Cut, Copy, Paste, etc., that simplify program editing. See page 74 for a listing and descriptions of these menu options.

3.7 Working With Projects

A project is a tool to manage the V+ files that you create and store on the PC. This tool creates a list of the files you want to keep together as a "project". When you build your project into the source files for transfer to the Adept controller, the project file is used to locate all of the different files. In addition to V+ source code, you can also attach documentation files (such as Microsoft Word, text files, or other file types), spreadsheet files, project management files, and AIM database files (archived on the PC's hard drive) to a project.

When you build a project, the AdeptWindows Offline Editor locates the source files and transfers them from the source directories to the target directories. See page 54 for details.

Creating a New Project

To create a new project:

File ➡ New Project...

The following dialog box is displayed:

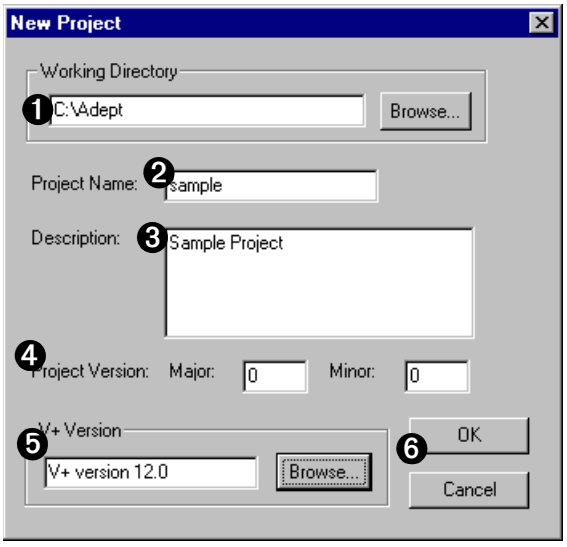


Figure 3-9
New Project Dialog Box

❶ Enter the directory and path where the project will be stored. You can type the information or choose **Browse** to scroll through a list of available drives / directories.

❷ Enter the project name. The name must conform to file name specifications defined in Windows 95. The file name can contain up to 255 characters (including spaces) except for the following:

\ / : * ? " < > |

❸ Enter the project description. This description appears when you access the Project Information dialog box.

❹ Enter the project version. For example, if you are creating version 3.1 of your project, Major = 3, Minor = 1.

❺ Enter the V+ version. (This enables the correct syntax checking for the V+ programs.) You can type the information or choose **Browse** to scroll through a list of available versions.

NOTE: V+ versions 8.4 and 10.5 apply to all releases of version 8.x and version 10.x, respectively.

❻ Choose **OK** to save all entries and close the dialog box, or choose **Cancel** to clear all entries and close the dialog box.

At this point, you must create the V+ program files for the project (see page 47) and place these files on the project file list (see page 52).

Opening an Existing Project

To open an existing project:

File ➡ Open Project... ➡ *double-click project name*

The Project Information dialog box is displayed. See the following section for details.

Getting Information on the Current Project

To get information about the current (open) project:

Project ➡ Project Info...

The following dialog box is displayed:

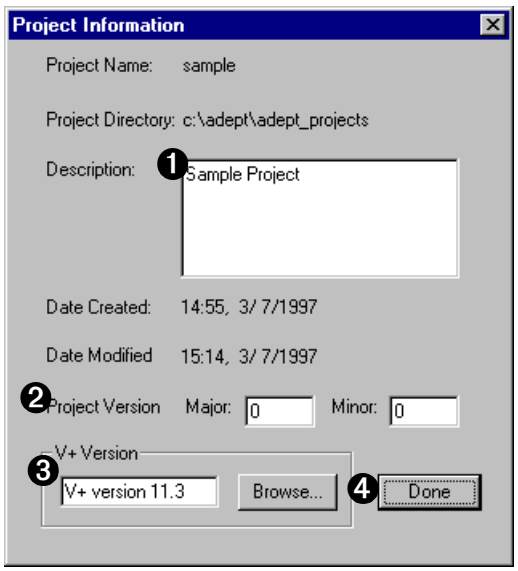


Figure 3-10
Project Information Dialog Box

The Project Information dialog box displays information about the project (name, description, date created, date modified, etc.). You also have the option to edit the following items:

❶ You can edit the project description directly in the **Description** field.

❷ You can edit the **Major** and **Minor** Project Version numbers.

❸ You can change the V+ version by typing the new version number or by choosing **Browse** to scroll through a list of available versions.

❹ After you have finished viewing/editing the dialog box, choose **Done** to close the dialog box.

Modifying Project Files

The Project Files dialog box is used to modify the files within the current (loaded) project. To display the Project Files dialog box:

Project ➡ Files...

The following dialog box is displayed:

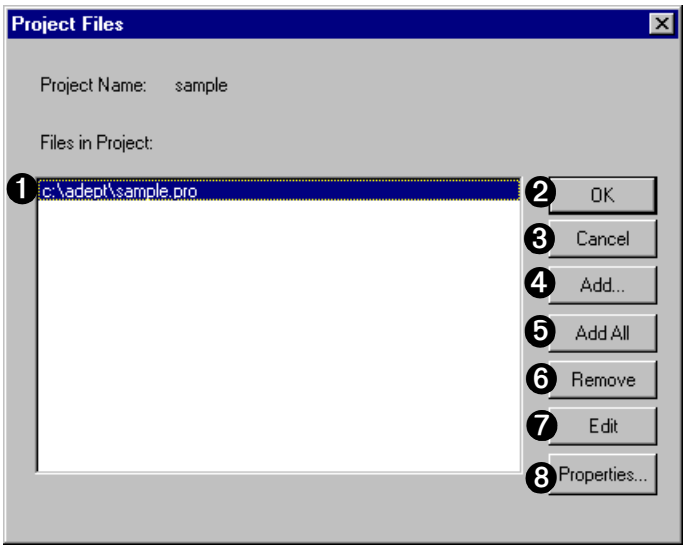


Figure 3-11
Project Files Dialog Box

❶ This item contains a list of the files in the current project.

❷ Choose **OK** to save all changes and close the dialog box.

❸ Choose **Cancel** to close the dialog box prior to making any changes.

❹ Choose **Add** to add more files to the current project.

❺ Choose **Add All** to add all files in the working directory to the current project.

❻ Choose **Remove** to remove the selected file from the current project.

> **NOTE:** The file name is removed from the project file list. The file is not deleted from the hard disk.

❼ Choose **Edit** to edit the selected file.

❽ Choose **Properties** to display the File Attribute dialog box for the selected file. See Figure 3-12 for details.

Modifying Project File Attributes

The File Attributes dialog box allows you to change the attributes (Source / Destination File Type and Target Directory) for the file selected on the Project File dialog box. To display the File Attributes dialog box:

Project ➡ Files... ➡ ***select a file name*** **➡ Properties**

The following dialog box is displayed:

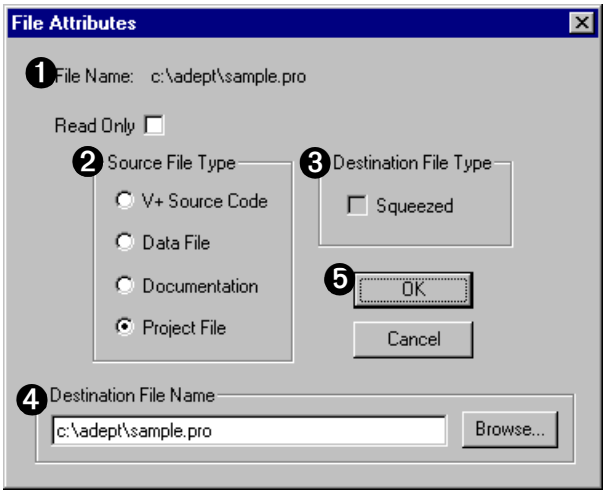


Figure 3-12
File Attributes Dialog Box

❶ This item displays the name of the selected file.

NOTE: The **Read Only** ☑ option is not enabled in this release.

❷ Use this group to set the file type for the source file.

V+ Source Code: a V+ file that can be edited with the AdeptWindows Offline Editor.

Data File: any source file on the PC.

Documentation: a text file created by a text editing program.

Project File: a file with a .PRO extension. This file is used as a directory to other files in the project.

❸ Select ☑ **Squeezed** if you want all comments and blank lines removed from the destination file. The .SQU extension is automatically added to the destination file name.

NOTE: This option is enabled only for V+ Source Code files.

❹ Enter the destination directory and file name. This is the location that the file is copied to when you build the project. You can type the information or choose **Browse** to scroll through a list of available directories.

❺ Choose **OK** to save all entries and close the dialog box. Choose **Cancel** to clear all entries and close the dialog box.

Building a Project

Once your project is completed (you have created a project and written all of the V+ programs for the project), you are ready to "build" the project. The Build menu option, located on the Project menu, copies all of the V+ program files for the project to the specified target directories.

The target directory can be a floppy disk (for transfer to the Adept controller, creation of a utility disk, etc.) or any directory on the hard disk drive of your PC. If the Ethernet NFS

option is installed on your PC and on the Adept controller, you can directly access the hard disk drive on the controller and use any directory on that drive as a "target" directory. See the *AdeptNET User's Guide* for details on installing the NFS option.

If you select the ☑ **Squeezed** option (on the File Attributes dialog box), all header information, comments, and blank lines are removed from the specified file(s) as they are being copied to the target directories.

Listing and Renaming Program Files

The Program List dialog box provides a pop-up list of all the V+ programs contained in a file. It provides an easy way to navigate between all of the programs. It also provides an option for renaming a program.

To display the Program List dialog box:

Search ➡ List All Pgms...

The following dialog box is displayed:

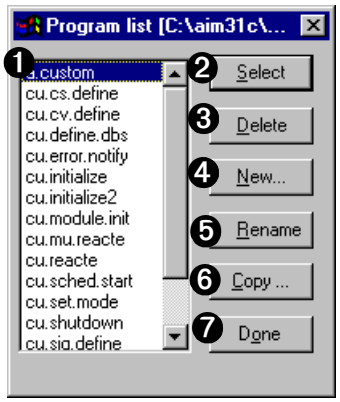


Figure 3-13
Program List Dialog Box

❶ This item contains the listing of the program file names.

❷ Choose **Select** to display the selected program in the editor window.

❸ Choose **Delete** to delete the selected program from the file.

❹ Choose **New** to create a new program in the file.

❺ Choose **Rename** to rename the selected program.

❻ Choose **Copy** to make a copy of the selected program and insert it in the current file.

❼ Choose **Done** to close the Program List dialog box.

3.8 Customizing the Programming Environment

The AdeptWindows Offline Editor has two areas that you can customize:

- Program Header Template
- Highlighting Colors

The Standard Program Header

The AdeptWindows Offline Editor can insert a standard header template at the top of every program. This is an option that is selected on the New File / Program Name dialog box (see page 48 for details).

The editor includes a dialog box that allows you to customize the header template information. This is useful for adding header information that is used in every program (this eliminates retyping it each time). For example, you could have a standard template that includes your company name and address; your name as the program author; and categories for typing program-specific information (abstract, input / output parameters, side effects, etc.).

To customize the program header:

Edit ➡ Properties ➡ Define Pgm. Header...

The following dialog box is displayed:

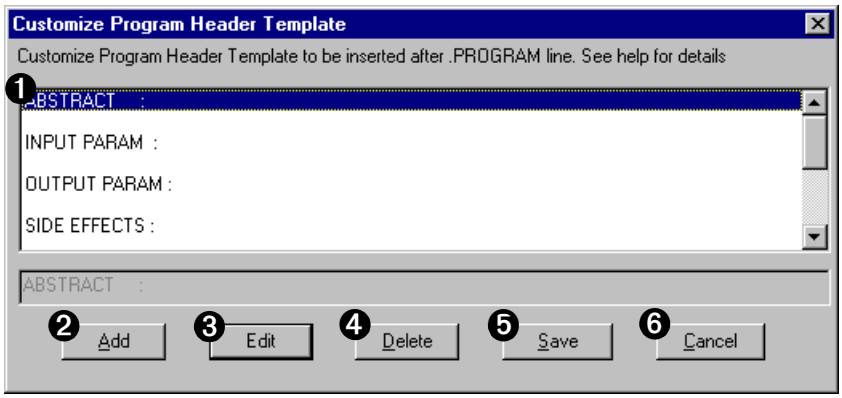


Figure 3-14
Customize Program Header Template Dialog Box

The template has six predefined categories: ABSTRACT, INPUT PARAM, OUTPUT PARAM, SIDE EFFECTS, DATA STRUCT, and MISC. You can edit the template as follows:

❶ This item displays the program header template.

❷ To add a new line, select an existing line (item ❶) and choose **Add**. The new line is inserted below the selected line.

❸ To edit an existing line, double-click the line or select the line and choose **Edit**. The selected line is displayed in the edit dialog box (item ❶).

❹ To delete a line, select the line (item ❶) and choose **Delete**. The selected line are removed from the template.

❺ Choose **Save** to save the changes and close the dialog box.

❻ Choose **Cancel** to clear all changes and close the dialog box.

Customizing the Highlighting Colors

The AdeptWindows Offline Editor allows you to customize the colors used to identify variables, comments, and other parts of a program.

To edit the color scheme:

Edit ➡ Properties ➡ Set Color

The following dialog box is displayed:

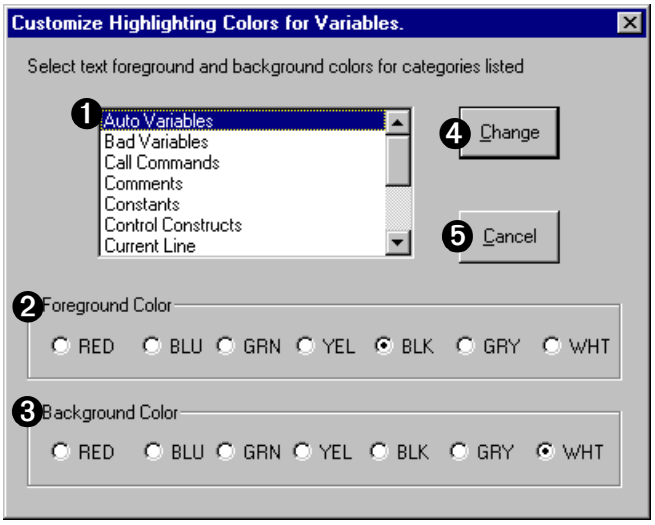


Figure 3-15
Customize Highlighting Colors

❶ Select the category that you want to change.

❷ **Foreground Color** sets the color of the text.

❸ **Background Color** sets the color of the area behind the text.

> **NOTE:** Always use different (contrasting) colors for the foreground and background. Otherwise, the corresponding text line(s) will not be legible.

❹ Choose **Change** to save the new settings.

❺ Choose **Cancel** to clear the new settings and close the dialog box. This must be done prior to choosing item ❹.

3.9 Creating CALL Tree and Keyword Listings

You can create calling tree listings for your V+ program files using the AdeptWindows Offline Editor. This is useful for debugging the code and for documentation purposes.

CALL Tree Listing

To create a call tree listing, load a program file (see page 48) and then:

Tools ➡ CallTrees...

The following window is displayed:

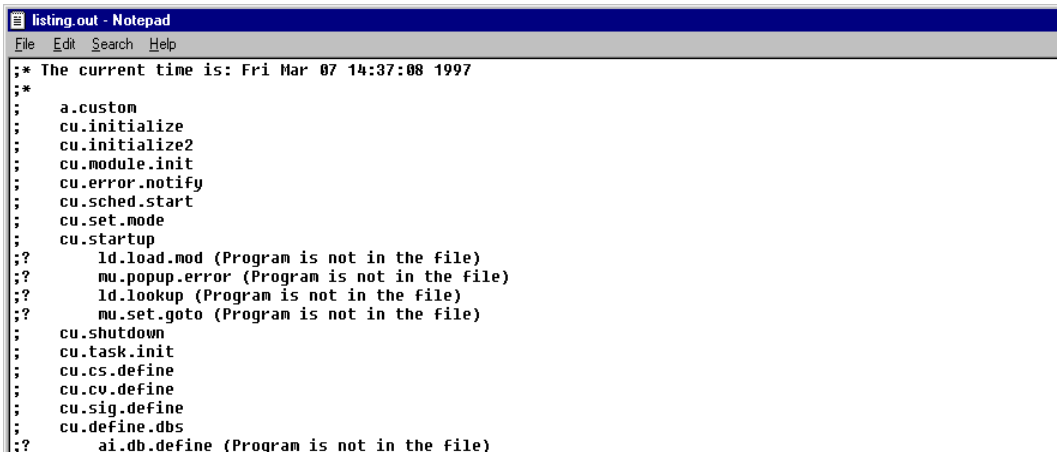


Figure 3-16
Sample CALL Tree

The window displays a text file with the call tree listing. The file is displayed using Windows 95 Notepad. It can be viewed, edited, and saved with Notepad or any text editor.

Keyword Listing

The keyword listing menu item searches the program file for all occurrences of a keyword and outputs this to a text file.

To create a keyword listing:

Tools ➡ Listings...

The following dialog box is displayed:

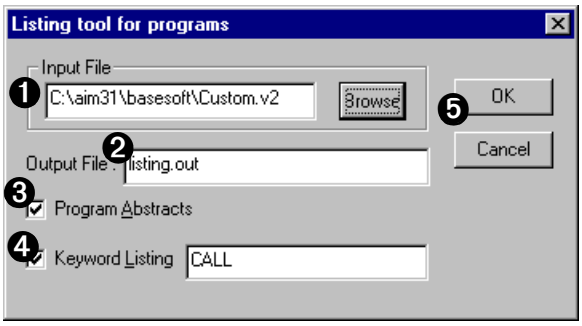


Figure 3-17
Listing Tool for Programs

❶ Enter the input file to process. This automatically defaults to the path and file name of the file currently being edited. However, you can enter the path and file name of any program file.

❷ Enter the output file name (this is the text file that contains the search results). The default file name is LISTING.OUT.

❸ Check this box to insert the input file header information at the beginning of the listing.

❹ Check this box to search for a specific keyword. Enter the keyword(s) in the corresponding field. If you wish to search for multiple keywords, enter all keywords separated by a comma.

❺ Choose **OK** to save all entries and close the dialog box. Choose **Cancel** to clear all entries and close the dialog box. If you choose **OK**, a window displays the search results:

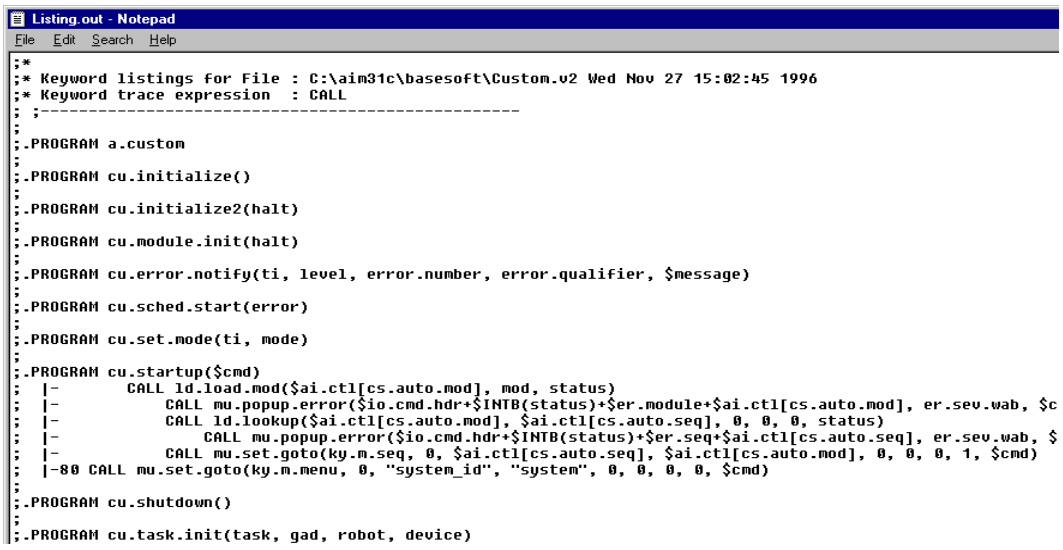


Figure 3-18
Sample Keyword Listing

The window displays a text file with the keyword listing. The file is displayed using Windows 95 Notepad. It can be viewed, edited, and saved with Notepad or any text editor.

3.10 Printing and Documentation

To make creation of program documentation easier, the AdeptWindows Offline Editor allows you to print programs and CALL trees. **Print** and **Print Preview** options are found on the **File** menu. See the Windows 95 online help system for more information on using these options.

> **NOTE:** The **Print** and **Print Preview** options use the standard Windows 95 printer interface.

Installing AdeptWindows A

A.1 Installing the AdeptWindows Software

The software for the PC is distributed on a single diskette. The disk contains an install program to properly install the software on the PC.

To install the software:

1. From the Start menu bar in Windows 95:

   Start ➡ Settings ➡ Control Panel ➡ Add/Remove Programs

   The following dialog box is displayed:

   NOTE: The contents of your dialog box may be different, depending on the Windows 95 applications that are installed on your system.

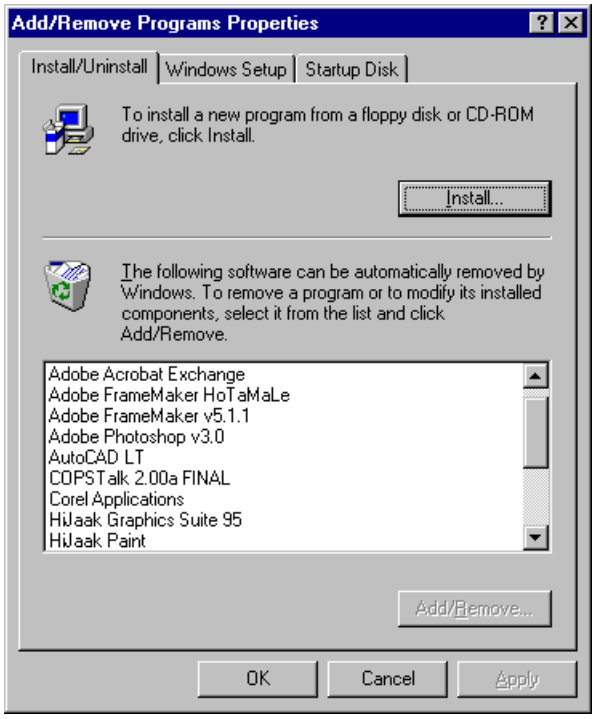


Figure A-1
Windows 95 Program Installation Dialog Box

2. Choose **Install** and insert the AdeptWindows Installation Disk into the 3.5” floppy drive (typically drive A) of the PC.
3. Choose **Next**. Windows should properly locate “A:\SETUP.EXE” as the install program.
4. Choose **Finish** to complete the installation process.
5. When the installation program asks for the serial number for the software, enter the number provided with your AdeptWindows disk.

   NOTE: Do not confuse this with the password for the AdeptWindows license on the controller.

By default, the software is installed into the subdirectory C:\Adept\AdeptWindows on the PC's hard drive. You can specify a different directory if desired.

> **NOTE:** The Adept controller requires V+ version 12.0 (or later) to interface to AdeptWindows PC. However, V+ version 12.0 is *not* required for the other options. See Table 1 on page 13 for the software requirements. See *Instructions for Adept Utility Programs* for information on using CONFIG_C to install a new operating system.

A.2 Installing the AdeptWindows License

The AdeptWindows PC software also requires the installation of the AdeptWindows license on the Adept controller.

> **NOTE:** Without this license, the controller recognizes the AdeptWindows PC interface. However, all AdeptWindows options are disabled.

To install the license on the Adept controller, type the following at the Monitor prompt:

```
INSTALL password
```

where "password" is the password for AdeptWindows on your controller.

> **NOTE:** Do not confuse this with the serial number for the setup program on the PC used to install the PC software.

A.3 Setting up a Serial Connection

This section describes how to set up a serial communication link between the PC and the Adept controller. If you are using an Ethernet communication link, see section A.4 on page 64.

> **NOTE:** The serial connection works only with the RS232 serial port on the main system processor. It cannot be used with the global serial ports located on the SIO module.

Required Cabling

Serial cabling is *not* provided with AdeptWindows. You must purchase the following items from a computer store or computer supply catalog:

- DB9 (female) to DB9 (male) serial pass-thru cable (available from any computer store).
- Null modem connector:

  For 68030 processor: DB9 (female) to DB9 (female)

  For 68040 processor: DB25 (male) to DB9 (female)

Hardware Connection

To setup the serial connection:

1. Connect one end of the serial cable to the COM port in your PC. Make a note of the COM port you are using (this information is required during the software startup).

2. Connect the other end to the NULL modem adapter.
3. Connect the open end of the adapter to the RS232 port of the main processor on the Adept controller.
4. Set the DIP switches on the SYSIO board.

   Switch 4 = ON (selects AdeptWindows)
   Switch 5 = ON (selects serial interface)

   NOTE: When the SYSIO DIP switches are set for AdeptWindows, the AdeptWindows option must be enabled (see section A.2 for details). Otherwise, the connection will succeed but all options will be unavailable.

Configuring the Serial Protocol

The serial configuration is set up automatically by the AdeptWindows PC software and V+ version 12.0 operating system. Therefore, you do not need to configure the serial protocol.

> **NOTE:** The V+ version 12.0 operating system (running on the Adept controller) and the AdeptWindows PC application (running on the PC) are configured to operate at a predefined baud rate. This protocol automatically overrides any previously-defined serial configuration for the serial port on the Adept controller and on the PC.

A.4 Setting up an Ethernet Connection

This section describes how to set up an Ethernet communication link between the PC and the Adept controller. If you are using a serial communication link, see section A.3 on page 63.

> **NOTE:** The names of remote systems defined in Windows 95 must be specified using the Windows 95 Network menus, or by using Dynamic Host Configuration Protocol (DHCP) in Windows 95. AdeptWindows has no control over these names. See the Windows 95 online help system for additional details.

Configuring the Ethernet Connection for the PC and Adept Controller

To set up the Ethernet connection between the Adept controller and PC you must configure both the PC and the controller. On the PC, you need a 10BASE-T Ethernet interface. On the Adept controller, you need the following hardware:

- AdeptNet option (PN 90332-02020)
- 68040 processor; 4 or 8 Mb (8 Mb required if using AIM 3.1)
- RJ45 cabling and hub

Please refer to your Windows 95 documentation for more information on networking the PC.

Installing TCP/IP on the PC

TCP/IP is a networking protocol that is used to establish Ethernet communications between the PC and the Adept controller. To set up TCP/IP on your PC:

1. From the START menu in Windows 95:

   Start ➡ Settings ➡ Control Panel ➡ Network

   The following dialog box is displayed:

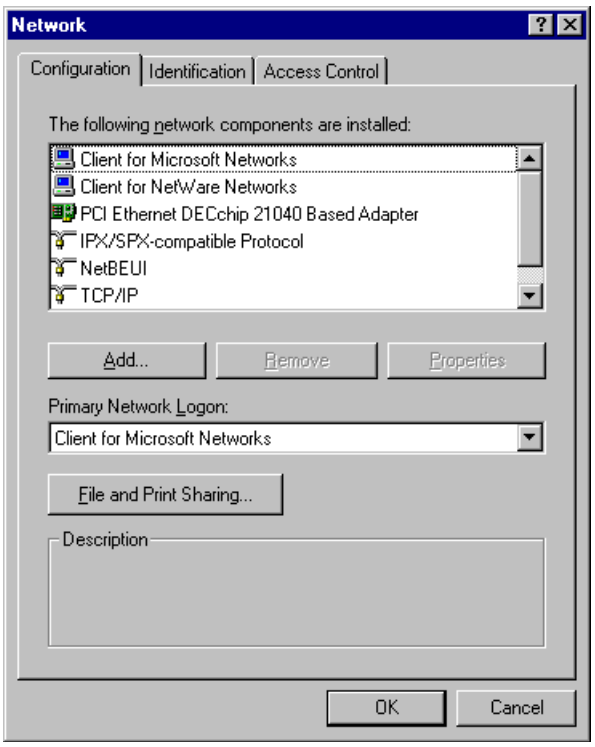


Figure A-2
Windows 95 Network Configuration Dialog Box

2. If TCP/IP is not on the list of installed components, choose **Add** to add a new protocol.

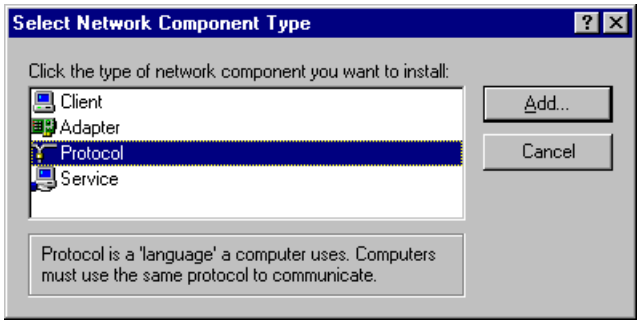


Figure A-3
Selecting a New Network Component

3. Select “Protocol” from the list of network components.
4. Choose **Add** to display the Network Protocol selection.

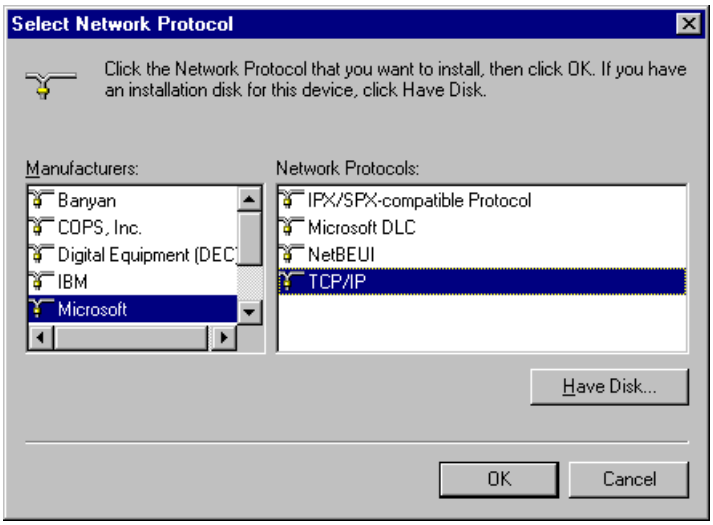


Figure A-4
Network Protocol Selection

5. Select “Microsoft” from the Manufacturers list.
6. Select TCP/IP from the Network Protocols list.
7. Choose **OK** to save these selections and return to the Network dialog box.
8. From the Network dialog box, select “TCP/IP”.

9. Choose the “Properties” tab to display the TCP/IP Properties dialog box.

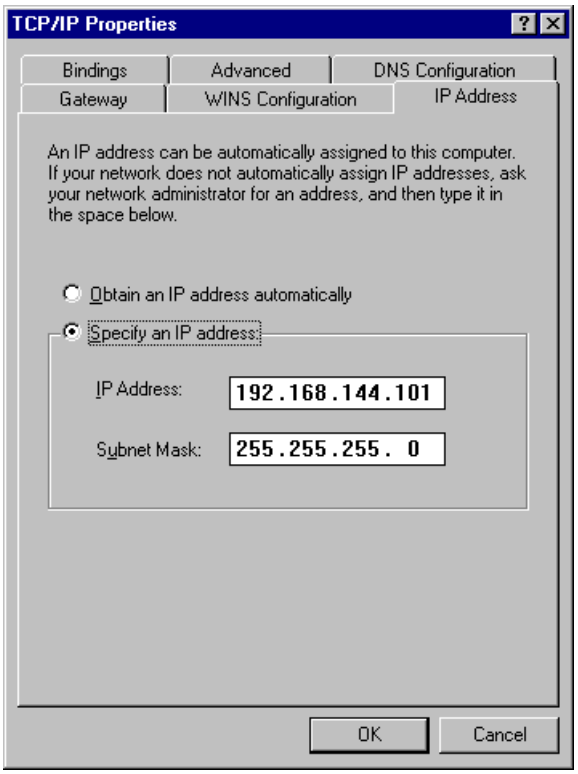


Figure A-5
Setting TCP/IP Address for the PC

Installing TCP/IP on the Adept Controller

The TCP/IP protocol is configured on the Adept controller using AdeptNet. AdeptNet is Adept’s Ethernet networking solution for the Adept MV controller. AdeptNet allows multiple Adept MV controllers to operate as nodes on a Local Area Network (LAN) that may include other non-Adept devices such as PCs or UNIX-based workstations. AdeptNet software allows for peer-to-peer communications, file transfer, and sharing of a (non-Adept) file server.

Refer to the *AdeptNET User’s Guide* for instructions on setting up the Ethernet connection on the Adept controller.

Setting the SYSIO DIP Switches

The DIP switches located on the SYSIO board must be set as follows:

Switch 4 = ON (selects AdeptWindows)
Switch 5 = OFF (deselects the serial interface)

NOTE: When the SYSIO DIP switches are set for AdeptWindows, the AdeptWindows option must be enabled (see section A.2 for details). Otherwise, the connection will succeed but all options will be unavailable.

Pinging the Controller

To test the Ethernet connection, it is useful to know how to "PING" between the PC and the controller. The PING command sends a quick message between the two devices and tells you whether the raw Ethernet connection is working.

To test the communication from the PC to the Adept controller, you must execute the PING command at the MS-DOS prompt. From the Windows 95 Program Manager, select:

Start ➡ Programs ➡ MS-DOS Prompt

At the MS-DOS prompt, type the PING command followed by the IP address (or host name) for the Adept controller:

```
PING 192.168.144.1
```

If the PING is successful, a message similar to the following is displayed:

```
    Pinging 192.168.144.1 with 32 bytes of data:

Reply from 192.168.144.1: bytes=32 time=39ms TTL=15
Reply from 192.168.144.1: bytes=32 time=39ms TTL=15
Reply from 192.168.144.1: bytes=32 time=39ms TTL=15
```

Pinging the PC

You can also use the PING command to test the communication from the Adept controller to the PC. At the Monitor prompt, type the PING command followed by the IP address (or host name) for the PC:

```
PING 192.168.144.101
```

If the PING is successful, the following message is displayed:

```
.Success
```

A.5 Installing DDE With AIM

The DDE driver software is part of the standard AIM 3.1 Baseline module. However, it is not automatically enabled.

To enable the AIM DDE server:

Setup ➡ Initialization Data ➡ *double-click "baseini.db"* ➡

Seek ➡ Index ➡ *double-click "DDE enable"*

The DDE Enable record is displayed.

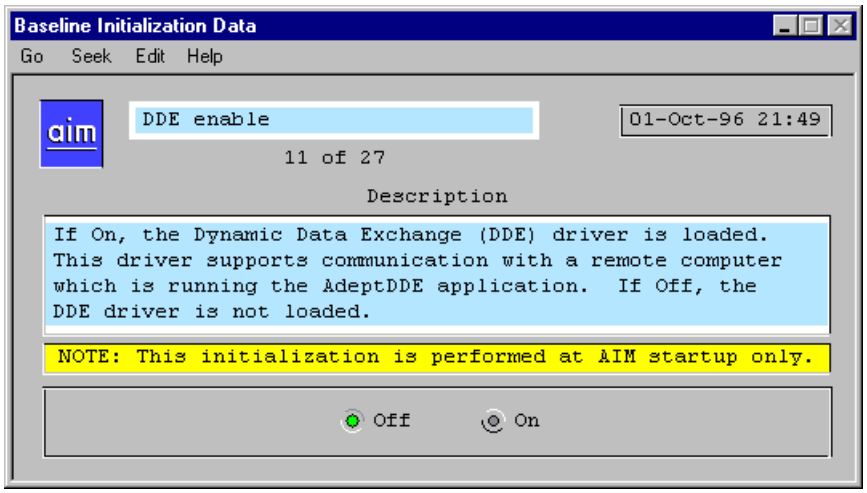


Figure A-6
DDE Enable Record

Select ◉ **On** to enable the DDE server (the default setting is Off).

Shut down AIM and then restart it. The DDE server is automatically enabled.

A.6 Other Considerations

This section contains other installation and setup information that may apply to your system when using AdeptWindows.

- The optimum desktop setting for the Windows 95 taskbar is “Autohide” and “Always on Top”. See the Windows 95 online help system for details.
- On some computers with “Energy Star” compliant motherboards, any network connections may be disrupted when the BIOS power-save function activates. If your system exhibits this problem, you can correct it by disabling the power-save feature in the BIOS. See your PC user’s guide or installation manual for details.

Menu Bars and Quick Keys B

B.1 AdeptWindows PC Main Menu Bar

These menus are displayed whenever AdeptWindows PC is running

File	
Connect via Ethernet...	Starts a connection using the Ethernet link (see page 18).
Connect via COM port...	Starts a connection using the serial link (see page 19).
Scan Ethernet...	Broadcasts on the Ethernet for all MV controllers configured for AdeptWindows. Displays a list of IP addresses (see page 18).
Disconnect	Closes the connection between the PC and the current controller (see page 21).
Start AdeptDDE	Starts the AdeptWindows DDE application (see page 24).
Normal size	Reduces the window from the maximum size.
About AdeptWindows PC...	ID window for AdeptWindows PC. Lists current version number.
Exit	Exits the program.

Adept	
Vision	Displays the Vision window if the Vision option is enabled (see page 20).
Monitor	Displays the Monitor window (see page 20). Note: Other window names created by V+ programs also appear here.

B.2 AdeptWindows DDE Server Main Menu Bar

These menus are displayed whenever AdeptWindows DDE Server is running.

File	
Hosts...	Adds, modifies, or deletes V+ hosts (see page 26).
Save	Saves the current DDE configuration.
Exit	Exits the program.

Connect	Displays a dialog box for connecting a host (see page 27).

Disconnect	Displays a dialog box for disconnecting a host (see page 27).

View	
Status Bar	Toggles the status bar (located at the bottom of the DDE window) on and off.

Status	
Connections...	Displays a list of connected hosts in the DDE window (see page 30).
Links	Displays a list of active links in the DDE window (see page 30).

Help	
About Adept DDE...	Displays a pop-up window with information about the version, edit, and edit date.

B.3 Offline Editor Main Menu Bar

These menus are displayed whenever the AdeptWindows Offline Editor is running.

File

New	**File...**	Creates a new .V2 file (see page 47).
Open	**File...**	Opens an existing .V2 file (see page 48).
Close	**File**	Closes the current .V2 file.
Save	**File**	Saves the current file.
Save	**File As**	Saves the current file using a new file name.
New	**Project...**	Starts a new project (see page 50).
Open	**Project...**	Opens an existing project (see page 51).
Close	**Project**	Closes the current project.
Save	**Project**	Saves the current project.
Print		Prints the current .V2 file.
Print Preview		Displays the file as it looks when printed.
Exit		Exits the program.

Edit

Undo	**Ctrl+Z**	Undoes the last entry, command, or keystroke, if possible.
Cut	**Ctrl+X**	Removes the selected text/graphics and places it on the clipboard.
Copy	**Ctrl+C**	Copies the selected text/graphics to the clipboard.
Paste	**Ctrl+V**	Inserts the contents of the clipboard at the current cursor position.
Select All	**Ctrl+L**	Selects the entire contents of the open file.
New Pgm...	**Ctrl+N**	Adds a new program to the current file (see page 49).
Delete Pgm...	**Ctrl+D**	Deletes a program from the current file.
Properties ▶		Changes fonts, foreground and background colors, and V+ version (see page 56).

Set Font Size ▶	Sets the font size at the cursor position or for the selected text.
Set Font Style ▶	Sets the font style at the cursor position or for the selected text.
V+ version...	Sets the current V+ version.
Read Only Mode	Makes the current program “read only” (disables editing).
Define Pgm. Header	Defines the standard header template (see page 56).
Set Color	Sets the foreground/background colors for variables, comments, etc. (see page 57).

Search

Find...	**Ctrl+F**	Finds a specified text string (see page 45).
Replace...	**Ctrl+H**	Finds a specified text string and replaces it with a specified text string (see page 45).
Goto Pgm...	**Ctrl+G**	Goes to the specified program in the current (displayed) file (see page 46).
Prev. Pgm...	**Ctrl+P**	Goes to the previously specified program in the current (displayed) file (see page 46).
List All Pgms...	**Ctrl+A**	Displays an alphabetical pick list of all the programs in the file (see page 46).
LIst Bad Pgms	**Ctrl+B**	Displays an alphabetical pick list of the programs in the file that have syntax errors (see page 46).
Next Error	**Ctrl+E**	Locates the next error in the current (displayed) file (see page 46).

Project

Files...	Displays the Project File dialog box (see page 53).
Project Info...	Displays the Project Information dialog box (see page 51).
Build	Builds the project (moves files to target directories, squeezes files, etc.; see page 54).

Insert

IF... THEN	Inserts a new IF structure into the program at the cursor position (see page 50).
CASE... OF	Inserts a new CASE structure into the program at the cursor position (see page 50).
FOR...	Inserts a new FOR structure into the program at the cursor position (see page 50).
WHILE	Inserts a new WHILE structure into the program at the cursor position (see page 50).
DO... UNTIL	Inserts a new DO structure into the program at the cursor position (see page 50).
Pgm. Header	Inserts the standard program header at the line below the .PROGRAM line (see page 56).
Date/Time	Inserts a comment line with the current date and time at the cursor position (see page 50).
Variable	Inserts a variable declaration at the line below the .PROGRAM line (see page 50).

Tools

Navigate	Displays an interactive CALL tree for the current file. Move to a CALLed program by choosing it (see page 46).
CallTrees...	Creates a text file listing of all CALLs in a specific program (see page 58).
Squeeze...	Creates a "squeezed" (compressed) version of the current program.
Listings...	Creates a text file listing of all occurrences of a specified keyword (see page 58).
Expand/Collapse	Expands or collapses the CALL tree created by the Navigate option (see page 47).
Expand All	Expands all branches of the CALL tree created by the Navigate option (see page 47).

Window

Cascade	Displays all open windows one in front of another.
Tile	Displays all open windows one next to another.
Narrow Mode Ctrl+O	Displays only one program in a multiprogram file. In Narrow mode, Find and Replace apply only to the displayed program.
1 Sample_file_1 **2 Sample_file_2**	Displays a list of available windows. Select a window name to make that window the active window.

Help

Quick Syntax On Line	**Sh-F1**	(Not enabled for this version.)
V+ Language Reference Menu	**F1**	(Not enabled for this version.)
Using the Help system		(Not enabled for this version.)
About AdeptWindows Offline Editor		Displays a pop-up window with information about the version, edit, and edit date.

Using Existing V+ Routines with AdeptWindows

C

C.1 Introduction

This appendix describes the changes required when upgrading existing V+ version 11.x routines for use with AdeptWindows and V+ version 12.0.

C.2 The BUFFERED Keyword

```
FOPEN(lun) "Iconname/ICON/BUFFERED"
```

The /BUFFERED keyword may appear in the FOPEN instruction when used for creating new icons. It causes the subsequent WRITEs to the icon to be buffered to 512 byte blocks. The syntax for WRITE remains unchanged.

C.3 The EVENT CONNECT Keyword

```
FSET(lun) "/EVENT CONNECT"
```

The new /EVENT CONNECT keyword enables connect and disconnect event notification. The event values are:

20 Connected to the PC front-end

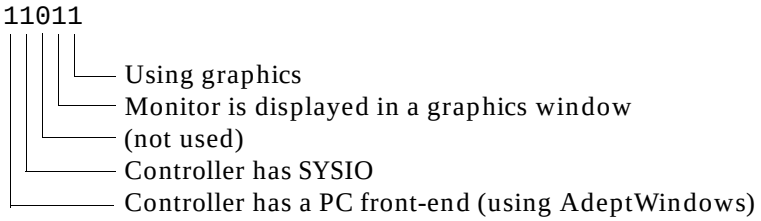
21 Disconnected from the PC front-end

C.4 The ID Keyword

```
ID(11,1)
```

In V+ version 12.0, the above code returns a bit mask value. The first bit and the last bit apply to AdeptWindows applications.

For example, if the above command returns a value of ^H1B on a system that is running AdeptWindows, this hex value translates to the binary value:



C.5 The MENU Keyword

```
FSET(lun) "Filename/MENU ..."
```

In V+ version 12.0, the /MENU keyword may appear only in the FSET instruction. (In version 11.x, the /MENU keyword was also allowed in the FOPEN instruction.)

C.6 Menu Events

Menu events may arrive at any time (if they are enabled) rather than just when the user clicks on the menu bar. These apparently random events always have menu ID (event[1]) equal to zero. For example, when you enter the following command:

```
FSET /MENU 'xxx' 'yyy' 'zzz'
```

three events will be received (i.e., <event[1] = 0, event[2] = 1; followed by: event[1] = 0, event[2] = 2>; followed by: <event[1] = 0, event[2] = 3>).

These events are intended to elicit the FSET / PULLDOWN instructions from V+ to set the contents of all possible pull-down menus.

C.7 Window Size

In V+ version 11.x, the minimum window size (for windows containing a title bar) is 64 x 64. (This means that windows with a dimension of less than 64 x 64 are automatically increased to 64 x 64.) In V+ version 12.0, the minimum window size is 8 x 8 (this is the same as windows without title bars).

If your program specifies a window dimension less than 64 x 64, the window displayed in V+ version 12.0 will be smaller than it was in V+ version 11.x.

C.8 Example V+ Program

The following V+ program illustrates the correct use of the items discussed in this chapter.

```
;ABSTRACT     :  The following example program shows how to use an
;               event loop to make selections in a menu program.
;
;INPUT PARAM  :
;
;OUTPUT PARAM :
;
;SIDE EFFECTS :
;
;DATA STRUCT  :
;
;MISC :
;
;* Copyright (c) 1997 by Adept Technology Inc.
;-------------------------------------------------------

        AUTO glun

; Attach to a window Logical Unit (LUN)

        ATTACH (glun, 4) "GRAPHICS"

; Open the window "example" with a maximum size of 400 x 300 pixels

        FOPEN (glun) "example", "/MAXSIZE 400 300"

; Check to see if system is running AdeptWindows or is using the VGB
; If the system is using AdeptWindows write the Adept icon to the
```

```
; window.

        IF (ID(11,1) BAND BMASK(5)) AND (ID(11,1) BAND BMASK(1)) THEN
            GICON (glun) 365, 1, "system_adept"
        END

; Set the top-level menu bar and enable monitoring of events

        FSET (glun) "/menu 'File 1' 'Edit 2' 'Menu 3'"
        FSET (glun) "/event button menu connect"

; Define the strings for the pull-down menus

        $menu[1] = "'Item 1-1' 'Item 1-2'"
        $menu[2] = "'Item 2-1' 'Item 2-2' 'Item 2-3'"
        $menu[3] = "'Quit'"

; Set variable for event to be monitored

        wn.e.menu = 14
        wn.e.connect = 20
        wn.e.disconnect = 21

; Start the processing loop

        quit = FALSE
        DO
            GETEVENT (glun) event[]
            CASE event[0] OF
              VALUE wn.e.menu:

; The menu event (14) has two components; a button-down component
; corresponding to a click on a menu bar selection, and a button-up
; component corresponding to the pull-down selection made when the
; button is released.
; After the first component (pointer down on the menu bar), event[1]
; will be 0 and event[2] will have the number of the menu bar
; selection.

; Check to see if event[1] is 0, indicating a top-level menu select

                IF event[1] == 0 THEN

; Use the value in event[2] to select a pull-down menu

                    FSET (glun) "/pulldown", event[2], $menu[event[2]]

; Else, execute the appropriate code for each menu selection

                ELSE

; If event[1] is not 0, then the button has been released on a
; pull-down selection and:
;       event[1] will have the value of the top-level selection (menu)
;       event[2] will have the value of the pull-down selection (item)

                    menu = event[1]
                    item = event[2]
```

```
; The outer CASE structure checks the top-level menu selection
; The inner CASE structure checks the item selected from the pull-down

                    CASE menu OF
                      VALUE 1:              ;Menu 1
                        CASE item OF
                          VALUE 1:
                                ;code for Item 1-1
                          VALUE 2:
                                ;code for Item 1-2
                        END
                      VALUE 2:              ;Menu 2
                        CASE item OF
                          VALUE 1:
                                ;code for Item 2-1
                          VALUE 2:
                                ;code for Item 2-2
                          VALUE 3:
                                ;code for Item 2-3
                        END
                      VALUE 3:              ;Menu 3
                        CASE item OF
                          VALUE 1:
                            quit = TRUE     ;Time to quit
                        END
                    END ;case menu of
                  END ;if event[1]
                VALUE wn.e.connect:     ;redraw
                                        ;reload user-defined icons
                VALUE wn.e.disconnect:  ;perform any operations
                                        ;related to disconnect
              END ;Case event[0]
            UNTIL quit

; When the window is no longer needed, close and delete the window,
; and then detach from the logical unit.

            FCLOSE (glun)
            FDELETE (glun) "example"
            DETACH (glun)

            RETURN
.END
```

Troubleshooting D

D.1 Introduction

This appendix is designed to help you resolve problems that you may encounter when using AdeptWindows.

D.2 DDE Errors

You may receive DDE errors in the following situations:

- Connecting to a host
- Using DDE in Microsoft Excel

Connecting to Host

When connecting to a host, the connection is typically made within several seconds. If the Connect to Host dialog box and hourglass symbol continue to remain on the screen, check the following:

- The host must be correctly defined. You can display the host information by double-clicking the host name in the Connect to Host dialog box. See section 2.4 on page 27 for details.
- AIM must be running on the Adept controller. See section 2.6 on page 28 for details.
- The AIM DDE Enabled option must be initialized. If it is not, you must turn it on and then restart AIM. See section A.5 on page 68 for details.

Using Microsoft Excel

- If the AdeptWindows DDE server is not running, Microsoft Excel reports:

  Remote data not accessible, start application “Adept.exe”?

  Choose **No** and start up the AdeptWindows DDE server. If the AdeptWindows DDE server is running, check that the host name is correct in the Excel formula and that the named host is connected (see section 2.4 on page 27).

- If the cell shows “#NAME?”, it means the AdeptWindows DDE server does not support the item (variable) name. Check the spelling of the item name. Once Excel has established a connection with the AdeptWindows DDE server, and cells have been defined with links to the server, you can check all the linked connections by selecting the Links option from the Excel Edit menu.

D.3 Energy Star Compliant Systems

On some computers that use “Energy Star” compliant motherboards, any network connections may be disrupted when the BIOS power-save function activates. If your system exhibits this problem, you can correct it by disabling the power-save feature in the BIOS. See your PC user’s guide or installation manual for details.

D.4 Ethernet TCP/IP

Connecting to an Adept MV Controller Through TCP/IP

The Adept MV controller and the PC must use the same subnet mask to enable communications through TCP/IP.

- Check the subnet mask setting for the PC using the Network option located on the Windows 95 Control Panel. See the Windows 95 online help for details.
- Check the subnet mask setting for the Adept MV controller using the CONFIG_C utility. See the manual titled *Instructions for Adept Utility Programs* for details.

NetManage's TCP/IP

It is not recommended that you run NetManage's TCP/IP in conjunction with Microsoft's TCP/IP. Doing so can cause a one-second delay when displaying characters in the monitor window that are typed on the keyboard.

To correct this problem, disable the NetManage TCP/IP connection. See the Windows 95 online help system for details.

D.5 PC or Adept MV Controller Problems

PC or Windows 95 Program Problems

If any of your Windows 95 programs causes your PC to lock up or crash while AdeptWindows PC is running, you may lose the AdeptWindows PC connection. You can reconnect AdeptWindows PC as follows:

1. Reboot your PC (required only if your Windows 95 operating system locks up).
2. Start AdeptWindows PC (see section 1.2 on page 18).

In most cases, this reestablishes the connection. However, if you receive a timeout error (10060), simply reconnect AdeptWindows PC.

Adept MV Controller Problems

If the Adept MV controller locks up or crashes while AdeptWindows PC is running, you can reestablish the connection as follows:

1. Exit AdeptWindows PC (see section 1.4 on page 21).
2. Reboot the Adept MV controller.
3. Start AdeptWindows PC (see section 1.2 on page 18).

D.6 SYSIO DIP Switches

When the SYSIO DIP switches are set for AdeptWindows the AdeptWindows option must be enabled (see section A.2 for details). Otherwise, the PC will connect to the MV controller, but all options will be unavailable.

D.7 TIFF Image Export

TIFF image export is supported only for Vision images when running AdeptWindows PC.

To export any other window, you can use any PC-based screen capture program (such as HiJaak by Quarterdeck Corporation). Once the window is captured, it can be saved to a file on the PC.

You can also use the Windows 95 screen copy command to capture the screen contents.

- Press ALT + PRINT SCREEN to copy the active window to the Windows 95 clipboard.
- Press PRINT SCREEN to copy the entire screen to the Windows 95 clipboard.

The clipboard contents can be pasted into a program or saved to a file. See the Windows 95 online help for details.

D.8 V+ License

When upgrading a system to V+ version 12.0B2 or higher (required for AdeptWindows), the 12.0 license must be installed on the controller. Otherwise, all other licenses (such as V+ Extensions, etc.) are deactivated until the 12.0 license is installed.

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R

Adept User's Manual Comment Form

We have provided this form to allow you to make comments about this manual, to point out any mistakes you may find, or to offer suggestions about information you want to see added to the manual. We review and revise user's manuals on a regular basis, and any comments or feedback you send us will be given serious consideration. Thank you for your input.

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00962-00710, Rev. A