

System Requirements

The SAS[®] System Version 7 (TS P1) Windows[®], Windows NT[®], Windows NT[®] Server

This document provides requirements for installing and running the SAS System for Windows, Windows NT, and Windows NT Server. You must update your system to meet the minimum requirements before running the SAS System. The major requirements listed in the document are:

- Software Requirements
- Hardware Requirements
- Additional Features
- Space Requirements
- Specific Product Requirements
- Graphics Hardware and Software Compatibility

For additional information and to view the latest system requirements for your system, access the SAS Institute Web site at:

http://www.sas.com/service/techsup/sysreq_index.html

or contact SAS Institute Technical Support (refer to Chapter 4, "Technical Support Services" in the installation instructions included in your package).

Software Requirements

Operating System

Windows NT and Windows NT Server:

Running the SAS System under Windows NT requires Windows NT, Version 4.0. It is strongly recommended that Windows NT, Version 4.0 be upgraded by applying Service Pack 3 or later. Administrator privilege is required to install various system updates. To insure that the SAS System can be completely and safely installed, it is strongly recommended that the installer have administrator privilege.

Windows:

Version 7 of the SAS System is compatible with the Microsoft Windows 95 and Microsoft Windows 98 operating systems.

IMPORTANT YEAR 2000 INFORMATION

This release of SAS software is Year 2000 compliant (as defined in SAS Institute's Year 2000 Web page at <http://www.sas.com/techsup/download/technote/y2kcomp.html>) when run on a vendor-supported Year 2000 compliant release of the host operating system and used in conjunction with third party software and hardware that is Year 2000 compliant. Some of the operating system releases and third party software releases or hardware models listed in this document may not be Year 2000 compliant. You should refer to the appropriate vendor's Web site for information on the compliance status of its products. For more detailed and updated Year 2000 information on SAS software products, please refer to SAS Institute's Year 2000 Web page at <http://www.sas.com/y2k>.

THIS IS A YEAR 2000 READINESS DISCLOSURE

File System Recommendations:

- The use of file systems supporting long filenames is recommended.
- For Windows NT, NTFS is recommended.

Network Installations:

Long filename support is recommended on any Windows NT server or Novell server where a server installation is performed.

Online Help Browser

To view the online help, Internet Explorer, Version 4 or later or Netscape Navigator, Version 3 or later is required. Internet Explorer, Version 4 or later is strongly recommended for viewing online help within the SAS System.

Hardware Requirements

Machines Supported

- Intel or Intel-compatible 80486 processor (minimum required)
- Pentium or Pentium II 133 MHz or higher (recommended)

Floating Point Unit or Math Coprocessor:

A floating point unit or math coprocessor is assumed to be present in the PC. The SAS System is optimized for its presence. Microsoft Windows provides floating point emulation software with decreased performance in the absence of a floating point unit or math coprocessor.

Memory Requirements

Windows and Windows NT:

- 32 MB minimum or more for improved performance
- 32 MB minimum of swapfile space

Windows NT Server:

- 64 MB minimum
- 64 MB minimum of swapfile space

Monitors Supported

- XGA
- SVGA

Note: It is recommended that screen resolution be at least 800x600.

Devices Supported

- A mouse is required

Additional Features

Web Browser

A Web browser is required to use two features of the SAS System.

1. Viewing output rendered as HTML pages using the Version 7 Output Delivery System (ODS). Any Web browser can be used for basic viewing, but if Internet Explorer, Version 4.0 (or higher) is used, ODS output can be viewed in an integrated browser window that functions as part of the SAS System. Other browsers can be used to view ODS output in a separate application window.
2. Using the online help system, which is HTML-based. The highest level of functionality is available when using Internet Explorer, Version 4.0 (or higher), which presents help information in the same layout used in Windows 98 and other newer Windows applications. This format is very compact and provides extensive searching capabilities. When using other Web browsers, online help can be viewed as basic HTML documents in a separate Web browser window. To support both types of operation, the SAS System is shipped with two sets of online help files.

Although any Web browser can be used for these two features, the use of Internet Explorer, Version 4.0 (or higher) enables the most completely functional user interface. For that reason, the use of Version 7 of the SAS System with Internet Explorer, Version 4.0 (or higher) is *strongly recommended*.

For your convenience, a minimally installable version of Internet Explorer, Version 4.01 is included with Version 7 of the SAS System for Windows, Windows NT, and Windows NT Server. If selected by the SAS Setup program, this minimal version of Internet Explorer is installed for basic operation with the SAS System. This minimal version does *not* change your default browser settings or any other desktop settings. It can co-exist with Netscape or other browsers on your system.

If you are using an older version of Internet Explorer as your default browser, you will notice a change to your system. In this case, Internet Explorer is upgraded to Version 4.01.

SAS System ODBC Support

Base SAS software supplies a 32-bit ODBC (Open DataBase Connectivity) driver, as well as a SAS ODBC server software. This allows you to access, update, or manipulate SAS data on your local or remote SAS System from any Windows ODBC-compliant application. The ODBC driver also allows you to access, but not update, local or remote SAS server data views that describe data stored in other databases, such as DB2/2.

If you will be accessing remote SAS data using ODBC, you will need to have SAS/SHARE software and SAS/SHARE*Net software licensed and installed on your remote SAS System. The ODBC driver that comes with Base SAS software is the same ODBC driver that is distributed with SAS/SHARE*Net software.

SAS System Viewer

The SAS System Viewer is an application intended for the Windows environment as a *lightweight viewer* for SAS data files and other simple text-based files. The application lets you view the contents of SAS data files without using the SAS System and without requiring the SAS System to be installed on your machine. You may distribute this application royalty-free in order to give other people the ability to view your SAS data.

The SAS System Viewer lets you view the following types of SAS data sets and SAS catalogs, which can reside on a local or network disk:

- SAS data sets generated by Version 7 of the SAS System for Windows, Windows NT, and Windows NT Server.
- SAS data sets generated by any Version 6 release of the SAS System for Windows, OS/2, or DOS. These data sets can be compressed and/or encrypted. If you attempt to access an encrypted data set, the SAS System Viewer prompts you for the read password.
- SAS catalogs created by the SAS System for Windows or OS/2 generated by Release 6.04 through Release 6.12.
- SAS programs (.sas files), output listings (.lst files), logs (.log files), configuration files (.cfg files).
- Files created by SAS Institute's JMP product (.jmp files) that reside on a local or network disk.
- Other simple (ASCII) text-based files.
- HTML pages, such as output rendered by Version 7 of the SAS System.

You can also view cross-platform Version 6 data sets and catalogs (VMS, Macintosh, UNIX, OS/2, Windows, and DOS) that you can access from a disk, file server, or using the HTTP and FTP network protocols.

About 3.4 MB of disk space is required to install the SAS System Viewer.

The SAS System Viewer is included on the installation media. You can run the SAS Setup program from the SAS System Installation CD (\SASVIEW\SV.EXE) or you can install the SAS System Viewer from the install menu of the SAS System core installation.

See the *readme* file on the SAS System Installation CD (\SASVIEW\README.RTF) for additional information on the SAS System Viewer.

Windows NT Performance Monitor and Event Log Support

Support for Windows NT Performance Monitor will allow advanced Windows NT users and administrators to observe some internal characteristics of the SAS System. This facilitates performance analysis and tuning of the SAS System. Also, support for the Windows NT Event Log allows the tracking of critical errors in the SAS System and SAS Setup. The user account installing the SAS System must have administrator privileges to install these features, so non-administrators will not get these features by default. They can be added later by invoking `setup.exe` with the following command lines:

To install the Windows NT Performance Monitor and Event Log:

```
setup perfmon
```

To uninstall the Windows NT Performance Monitor and Event Log:

```
setup uperfmon
```

Dynamic Data Exchange

Dynamic Data Exchange (DDE) allows for the exchange of data between the SAS System and any other application supporting DDE. The SAS System will act as a client only.

Object Linking and Embedding

Object Linking and Embedding (OLE 2.0) container support is available in SAS/AF software and SAS/EIS software. Container support includes the ability to create embedded/linked objects, script OLE Automation servers, and embed OLE controls. Visual editing and drag-and-drop support are also included.

The SAS System also provides OLE Automation server support. This support is provided in Base SAS software to push commands to the command line of the SAS System and submit procedural code. The OLE Automation server can be driven from other OLE Automation controllers such as Microsoft Visual Basic.

Electronic Mail

Send . . . is provided as a menu item in the File pull-down menu. Send . . . allows electronic mail messages to be initiated from the SAS System. It is also possible to send mail using a data step file access method or SCL via SAS/AF software. The following mail APIs are supported - MAPI and VIM. This requires installation of third party products such as MExchange, MSMail 3.2+, Lotus ccMail 8.1 (32-bit version only), or Lotus Notes 4.0 (32-bit version only) and above. SMTP email server access via MAPI requires an Internet connection.

Lotus Notes

The Lotus Notes access method, NOTESDB, allows populating new documents directly to Lotus Notes from the SAS System. An installed license of Lotus Notes Desktop is required. The SAS System supports the 32-bit version of Lotus Notes 4.0 or later.

FTP, Socket, and Catalog Access Methods

External access methods make remote data available to local processing via the FTP and Socket access methods. FTP allows access to remote external files using the TCP/IP ftp service. Access to remote data via the Socket access method supports TCP/IP socket programming to the SAS Data Step and SAS/SCL. In addition, SAS catalogs can be read as external files using the Catalog Access method.

Re-installation Support

Re-installation support is provided during *Server* installs and is available as an optional component during a *Personal Custom* install. Selection of the re-installation support component causes SAS Setup to create a copy of the SAS System with a customized list of products from which SAS Setup subsequently can be used to create additional installations. Typically, re-installation support would be used by an administrator to create an installable copy of the SAS System on a networked file server machine.

Both help systems are installed when the re-installation support component is selected because SAS Setup must be able to install the appropriate help system for each target machine. On a FAT file system, the simple HTML help system consumes a large amount of space because it consists of a large number of HTML files. Thus, the combined space requirements of both help systems can be as large as several hundred MB. Selecting the re-installation support component has the potential for greatly increasing the disk space requirements.

Space Requirements

The media you received is customized for your site and contains all of the SAS software products for which you are licensed.

The following list contains space requirements in MB for all of the products available with Version 7 (TS P1) of the SAS System for Windows, Windows NT, and Windows NT Server. Use this information to help you determine how much free disk space you must have available before you can install the SAS System.

Disk space requirements will vary depending upon the blocking factor and compression algorithms that are in use on the installation disk drive. Product disk space values were determined with the HTMLHelp System in use.

Software Product	Disk Space (in MB)
Base SAS Software	0.5
Core of the SAS System (required)	115.0
SAS/ACCESS Interface to DB2 Software	0.2
SAS/ACCESS Interface to ODBC Software	0.3
SAS/ACCESS Interface to OLE DB Software (Experimental)	0.2
SAS/ACCESS Interface to ORACLE Software	0.3
SAS/ACCESS Interface to PC File Formats Software	4.5
SAS/ACCESS Interface to SYBASE Software	0.3
SAS/AF Software	3.5
SAS/ASSIST Software	16.0
SAS/CONNECT Software	2.1
SAS/EIS Software	28.0
SAS/ETS Software	13.6
SAS/FSP Software	0.5
SAS/GIS Software	40.0
SAS/GIS Census Tract Maps*	440.0
SAS/GRAPH Software	30.0
SAS/GRAPH Map Data Sets	98.0
SAS/IML Software	4.3
SAS/INSIGHT Software	3.6
SAS/IntrNet Software	1.5
SAS/LAB Software	6.1
SAS/MDDB Server Software	0.1
SAS/OR Software	25.9
SAS/QC Software	16.9
SAS/SECURE Software	0.1
SAS/SHARE Software	0.4
SAS/SPECTRAVIEW Software	13.0
SAS/STAT Software	27.0
ODBC Driver Software	1.7
SAS System Viewer	3.5
Re-installation Support	304.0
Microsoft's Internet Explorer	12.0
Total with Re-installation Support	700.0
Total without Re-installation Support	500.0

*SAS/GIS Census Tract Maps are installed from a separate CD-ROM.

SAS/IntrNet Software Components

Software Component	Required Disk Space in MB
Application Dispatcher	0.4
htmSQL	0.6
Java Tools	2.0
MetaSpace Explorer	6.5
Connection Wizard	7.2
Tunnel Feature	0.2
SAS SQL Library for C	0.6
Documentation Package	9.0

Specific Product Requirements

SAS/ACCESS Interface to DB2 Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to DB2 software

DBMS Products Required:

One of the following releases of IBM's Client Application Enabler software is required:

- IBM DATABASE 2 Client Application Enabler, Version 2.1.1 or later
- IBM DB2 Universal Database Client Application Enabler, Version 5 or later

Note: If you are running SAS/ACCESS Interface to DB2 software under Windows 98, please use the IBM DB2 Universal Database Client Application Enabler, Version 5.2 or later.

Before using SAS/ACCESS Interface to DB2 software, you must install the appropriate IBM DB2 Client Application Enabler to allow your PC to connect to a DB2 server. Contact your database administrator for assistance with the Client Application Enabler's Client Setup utility.

For more information about SAS/ACCESS Interface to DB2 software, please see the DB2 chapter in *SAS/ACCESS Software for Relational Databases: Reference, Version 7, First Edition*.

SAS/ACCESS Interface to ODBC Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to ODBC software

DBMS Products Required:

- A 32-bit ODBC driver for the data source from which you want to access data

Before you can use SAS/ACCESS Interface to ODBC software, a 32-bit ODBC driver for the data source from which you want to access data is required. ODBC drivers are often available from DBMS vendors and other third party ODBC driver developers. The ODBC driver you choose may require additional DBMS software for network access. All required network software supplied by your database system vendor must be 32-bit-compliant.

In order to read SAS System, Version 6 views that were created with the discontinued SAS/ACCESS Interface to AS/400 software on OS/2, an ODBC Conversion Utility is provided to help users migrate to SAS/ACCESS Interface to ODBC software on Windows. Before you can use the ODBC Conversion Utilities, you need to install the Client Access ODBC Driver (32-bit), Version 3.00.0004 or above from IBM. If your AS/400 Client Access installation loaded a Client Access ODBC Driver prior to this version, you can download Program Temporary Fix (PTF) SF42728 or later from ftp.software.ibm.com for an update. The service packs for the Client Access product can be found in the `/as400/products/clientaccess/win32/v3r1m2/servicepack` directory. When this update is installed, Version 3.00.0004 or later of the Client Access ODBC Driver should be installed.

In order to read SAS System, Version 6 views to access data in Microsoft SQL Server that were created with SAS/ACCESS Interface to SYBASE and SQL Server software on Windows, an ODBC Conversion Utility is provided to help users migrate to SAS/ACCESS Interface to ODBC software on Windows. (Note: The Conversion Utility only applies to views that access data in Microsoft SQL Server and does not apply to SYBASE SQL Server.) Before you can use the ODBC Conversion Utilities, you need to install Microsoft SQL Server ODBC driver (32-bit), Version 2.65.0213 or above from Microsoft. This file can be found in the Microsoft ODBC Desktop Drivers 3.5 and can be downloaded from the Microsoft web site.

Please see the *Installation Instructions for Version 7 (TS P1) of the SAS System for Microsoft Windows* for the details of installation.

SAS/ACCESS Interface to OLE DB Software (Experimental)

Products Required:

- Base SAS software
- SAS/ACCESS Interface to OLE DB software (experimental)

DBMS Products Required:

- An OLE DB data source provider
- Microsoft Data Access Components, Release 1.5 or higher

Before you can use SAS/ACCESS Interface to OLE DB software, an OLE DB provider for the data source from which you want to access data is required. OLE DB providers are often available from DBMS vendors and other third party software vendors. The OLE DB provider you choose may require additional DBMS software for network access. All required network software supplied by your database system vendor must be 32-bit-compliant.

The Microsoft Data Access Components (MDAC) are available from Microsoft and can be downloaded from:

<http://www.microsoft.com/data/oledb>

SAS/ACCESS Interface to ORACLE Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to ORACLE software

DBMS Products Required:

If you are using ORACLE Client, Version 7.3, you need to install:

- ORACLE SQL*Net Client, Version 2.3 for Windows NT and Windows 95
- ORACLE Protocol Adapter, Version 2.3 for Windows NT and Windows 95

If you are using ORACLE Client, Version 8.0, you need to install:

- ORACLE Net8 Client for Windows NT and Windows 95
- ORACLE Protocol Adapter, Version 8.0 for Windows NT and Windows 95

You need to install SAS/ACCESS Interface to ORACLE software and ORACLE SQL*Net Client, Version 2.3 or ORACLE Net8 Client on the same client workstation. SAS/ACCESS Interface to ORACLE software only supports ORACLE Client, Version 7.3 or above. However, it can connect to any version of an ORACLE database with the SQL*Net, Version 2 listener running on the server.

Note: If you are running SAS/ACCESS Interface to ORACLE software under Windows 98, please use an ORACLE Client that supports Windows 98. This will include one of the following:

- Oracle8 Client, Version 8.0.5.0.0 or later
- Oracle7 Client, Version 7.3.4.0 or later

SAS/ACCESS Interface to SYBASE Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to SYBASE software

DBMS Products Required:

One of the following releases of SYBASE Open Client software is required:

- SYBASE, Open Client Release 10.0.4 or later
- SYBASE, Open Client Release 11.1 or later

Any version of SYBASE SQL Server, Release 10.0.1 or later is supported.

For more information about SAS/ACCESS Interface to SYBASE software, refer to *SAS/ACCESS Software for Relational Databases: Reference, Version 7, First Edition*.

Note: If you want to access Microsoft SQL Server data, you will need to use SAS/ACCESS Interface to ODBC software. Refer to Appendix F, "Installing SAS/ACCESS Interface to ODBC Software" in the *Installation Instructions for Version 7 (TS P1) of the SAS System for Microsoft Windows* for more information.

SAS/AF Software

Products Required for Build Mode:

- Base SAS software
- SAS/AF software
- SAS/GRAPH software (to create and display some graphics objects)
- Other products may be required depending on the application

Products Required for Run Mode:

- Base SAS software
- SAS/GRAPH software (to display some graphics objects)
- Other products may be required depending on the application

Printers:

- A color or gray scale printer is required for printing graphics-based objects.
- Certain non-graphic objects may require SAS/GRAPH software to print depending on the object.

Video Player Object in SAS/AF Software**Hardware:**

- SoundBlaster-compatible audio board
- External speakers
- MCI Microsoft Video for Windows driver
- MCI-compliant MPEG boards are supported
- Minimum of 256 colors
 - Video board supporting true color mode (65K or 16.7 MB colors) recommended

Base SAS Software**Video Player in Base SAS Software**

A Video Player utility is included with Base SAS software. This will allow users to play video clips on their workstations. The Video Player Object (Class) is actually part of SAS/AF software. The Video Player utility based on the Video Player Object is included with Base SAS software.

Hardware:

- SoundBlaster-compatible audio board
- External speakers
- MCI Microsoft Video for Windows driver
- MCI-compliant MPEG boards are supported
- Minimum of 256 colors
 - Video board supporting true color mode (65K or 16.7 MB colors) recommended

SAS/CONNECT Software

Windows:

APPC Access Method:

With the APPC access method, a Windows user is provided access to an SNA network. SAS/CONNECT software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinAPPC). Therefore, you should be able to use software from any vendor that supports this standard. One of the following software packages is required:

- Microsoft's SNA Server, Version 2.11 SP1 (Service Pack 1) or subsequent versions
- IBM's Personal Communications, Version 4.11 or subsequent versions
- Any program that supports WOSA (Windows Open Services Architecture) APPC (WinAPPC) standard

DECnet Access Method:

The DECnet access method requires the following software:

- Digital Equipment Corporation's Pathworks, Version 32 with Microsoft's Winsock, Version 2.0

EHLLAPI Access Method:

The EHLLAPI access method requires one of the following emulation packages:

- Wall Data's Rumba 95/NT, Version 5.0+
- Attachmate's EXTRA Personal Client, Version 6.1 or subsequent versions
- McGill Systems TCP3270, Version 3.0 or subsequent versions
- IBM's PCOM (Personal Communications), Version 4.1 or subsequent versions
- Any Windows 95 32-bit emulation program that supports the EHLLAPI or WinHLLAPI standards

NetBIOS Access Method:

For the NetBIOS access method, SAS/CONNECT software supports the NetBIOS protocol that is included with Windows 95.

TELNET and TCP/IP Access Methods:

For the TCP/IP access method, SAS/CONNECT software supports Microsoft's TCP/IP System Driver, which is provided with Windows 95.

Windows NT:

APPC Access Method:

With the APPC access method, a Windows user is provided access to an SNA network. SAS/CONNECT software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinAPPC). Therefore, you should be able to use software from any vendor that supports this standard. One of the following software packages is required:

- Microsoft's SNA Server, Version 2.11 SP1 (Service Pack 1) or subsequent versions
- IBM's Personal Communications, Version 4.11 or subsequent versions
- Any program that supports WOSA (Windows Open Services Architecture) APPC (WinAPPC) standard

DECnet Access Method:

One of the following software packages is required to use the DECnet access method:

If you have Windows, Version 4.0 installed, you must use:

- Digital Equipment Corporation's Pathworks 32

EHLLAPI Access Method:

The EHLLAPI access method requires one of the following emulation packages:

- Wall Data's Rumba 95/NT, Version 5.0 or subsequent versions
- Attachmate's EXTRA Personal Client, Version 6.1 or subsequent versions
- Any Windows NT 32-bit emulation program that supports the EHLLAPI or WinHLLAPI standards

NetBIOS Access Method:

For the NetBIOS access method, SAS/CONNECT software supports the NetBIOS protocol that is included with Windows NT.

TELNET and TCP/IP Access Methods:

For the TCP/IP access method, SAS/CONNECT software supports Microsoft's TCP/IP System Driver, which is provided with Windows NT.

SAS/EIS Software**Products Required for Build Mode:**

- Base SAS software
- SAS/AF software
- SAS/EIS software
- SAS/FSP software
- SAS/GRAPH software
- Other products may be required depending on the application

Products Required for Run Mode:

- Base SAS software
- SAS/GRAPH software
- SAS/EIS software
- Other products may be required depending on the application

Memory:

- 48 MB required
- 64 MB recommended

SAS/GIS Software**Products Required for Build Mode:**

- Base SAS software
- SAS/AF software
- SAS/GIS software
- SAS/GRAPH software
- Other products may be required depending on the application

Products Required for Run Mode:

- Base SAS software
- SAS/FSP software
- SAS/GIS software
- SAS/GRAPH software
- Other products may be required depending on the application

Printers:

- A color or gray scale printer is required. The list of possible printers can be found in the *Graphics Hardware and Software Compatibility* section.

Display:

- 256 color display adapter strongly recommended

SAS/IntrNet Software

SAS/IntrNet software consists of several components that may be installed independently. SAS/IntrNet Server software is installed on an existing SAS System and is included on the SAS System media. Other SAS/IntrNet software components may be installed from the SAS/IntrNet software media. See the *Space Requirements* section for the disk space requirements for these components.

CGI Tools and Applications**Application Dispatcher**

Requires Base SAS Software and SAS/IntrNet Server software. The Application Broker component must be installed on a Web server.

htmSQL

Requires Base SAS Software, SAS/SHARE software, and a SAS/IntrNet software license (SETINIT). The htmSQL component must be installed on a Web server running on a UNIX or Windows system.

Xplore Sample Web Application

Requires Base SAS software and SAS/IntrNet Server software. The Application Dispatcher component must be installed and configured.

Java Tools and Applications**SAS/SHARE Driver for JDBC**

Requires Base SAS software, SAS/SHARE software, and a SAS/IntrNet software license (SETINIT). The Java Tools package must be installed on a Web server or client system.

SAS/CONNECT Driver for Java

Requires Base SAS software, SAS/CONNECT software, and SAS/IntrNet Server software. SAS/SHARE software must also be installed if data services are used. The Java Tools package must be installed on a Web server or client system.

Tunnel Feature

Must be installed on a Web server running on a UNIX or Windows system.

MetaSpace Explorer Applet

Requires Base SAS software, SAS/CONNECT software and SAS/IntrNet Server software.

Client Components

SAS SQL Library for C

Requires Base SAS software, SAS/SHARE software, and a SAS/IntrNet software license (SETINIT). SAS SQL Library for C must be installed on a UNIX or Windows system with a TCP/IP network connection to the SAS/IntrNet Server.

ODBC Driver

Requires Base SAS software, SAS/SHARE software, and a SAS/IntrNet software license (SETINIT). The ODBC Driver may be installed on any Windows system with TCP/IP network connection to the SAS/IntrNet Server.

SAS/LAB Software

Products Required:

- Base SAS software
- SAS/FSP software (required for interactive data entry)
- SAS/GRAPH software
- SAS/LAB software

SAS/MDDB Server Software

Memory:

The memory requirements for SAS/MDDB Server software are dependent upon the complexity of the hierarchies generated.

- 48 MB required
- 64 MB recommended

Large applications will see performance improvements with more available memory.

SAS/SECURE Software

CryptoAPI from Microsoft is an application programming interface that provides access to the cryptographic services that are provided by:

- Windows 95 (as part of Internet Explorer 3.0+)
- Windows NT 4.0+ (as part of the Operating system) with Service Pack 3 or a subsequent release installed

You must have either of the following packages installed on your Windows host to use CryptoAPI:

- Microsoft Base Cryptographic Service Provider (supports weak encryption)
- Microsoft Enhanced Cryptographic Service Provider (supports strong encryption)

SAS/SHARE Software

Windows:

APPC Access Method:

With the APPC access method, a Windows user is provided access to an SNA network. SAS/SHARE software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinAPPC). Therefore, you should be able to use software from any vendor that supports this standard. One of the following software packages is required:

- Microsoft's SNA Server, Version 2.11 SP1 (Service Pack 1) or subsequent versions
- IBM's Personal Communications, Version 4.11 or subsequent versions
- Any program that supports WOSA (Windows Open Services Architecture) APPC (WinAPPC) standard

DECnet Access Method:

The DECnet access method requires the following software:

- Digital Equipment Corporation's Pathworks, Version 3.2 with Microsoft's Winsock, Version 2.0

NetBIOS Access Method:

For the NetBIOS access method, SAS/SHARE software supports the IBM-compatible or NetWare-compatible NetBIOS that is included with Windows 95.

TCP/IP Access Method:

For the TCP/IP access method, SAS/SHARE software supports Microsoft's TCP/IP System Driver, which is provided with Windows 95.

Windows NT:

APPC Access Method:

With the APPC access method, a Windows user is provided access to an SNA network. SAS/SHARE software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinAPPC). Therefore, you should be able to use software from any vendor that supports this standard. One of the following software packages is required:

- Microsoft's SNA Server, Version 2.11 SP1 (Service Pack 1) or subsequent versions
- IBM's Personal Communications, Version 4.11 or subsequent versions
- Any program that supports WOSA (Windows Open Services Architecture) APPC (WinAPPC) standard

DECnet Access Method:

One of the following software packages is required to use the DECnet access method:

If you have Windows, Version 4.0 installed, you must use:

- Digital Equipment Corporation's Pathworks 32

NetBIOS Access Method:

For the NetBIOS access method, SAS/SHARE software supports the IBM-compatible or NetWare-compatible NetBIOS that is included with Windows NT.

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TCP/IP Access Method:

For the TCP/IP access method, SAS/SHARE software supports Microsoft's TCP/IP System Driver, which is provided with Windows NT.

SAS/SPECTRAVIEW Software

SAS/SPECTRAVIEW software, one of the SAS System's newest data visualization and modeling tools, allows you to create, analyze, and modify geometric images representing multidimensional data. This software is useful for a variety of applications, including medical imaging, oil exploration, environmental sciences, chemical analysis, pharmaceutical studies, and financial analysis.

Hardware:

- Minimum screen resolution - 800x600
- Minimum of 256 colors

Graphics Hardware and Software Compatibility

Printers

SAS/GRAPH software supports any graphics printer that has a Microsoft Windows device driver available. This support is provided via the WINPRTM (for monochrome printers), WINPRTG (for printers that support gray-scale shading), and WINPRTC (for color printers) device drivers.

As an alternative to the WINPRTx series of drivers, SAS/GRAPH native device drivers are available for all Hewlett-Packard printers (and compatibles), and printers that support PostScript, HP-GL, HP PCL, and other printer languages.

Here is a partial list of printers that SAS/GRAPH software supports with native device drivers:

CalComp ColorMaster, ColorMaster Plus, PlotMaster
Canon Bubble Jet, Laser Shot
Digital printers which support either SIXEL, HP PCL, Tektronix, or PostScript emulation modes
Epson FX and LQ series printers (and all printers running in Epson emulation mode)
Hewlett-Packard LaserJet, DeskJet, PaintJet, and DesignJet printers (and compatibles)
IBM Graphics, Proprinter, and ColorJet printers
PostScript printers (including color and gray-scale PostScript printers)
QMS Colorgrafix with CGM interpreter
QMS 800, 1200, 1500, 2200, and 2400 using QUIC or Tektronix emulation modes
Talaris 800, 802, 1200, 1500, and 2400 using QUIC or Tektronix emulation modes
Talaris printers using the EXCL language
Tektronix Phaser printers (all models)
Tektronix 4693 printers with Tektronix 4510 rasterizer
Xerox 2700 and 4045 printers with a GRAPHX cartridge
Xerox 3700 (with imaging board and at least 1M of memory)
Xerox 4030 (contact Technical Support), 4213, 4235, and 4700
Xerox 4700 printer
Xerox 5775 color copier with an EFI Fiery attachment

Native drivers may also be available for additional printers not listed above and that do not support PostScript, HP-GL, or HP PCL. Contact SAS Institute Technical Support for additional information on these drivers.

Plotters

SAS/GRAPH software supports any plotter that has a Microsoft Windows plotter driver available. This support is provided via the WINPLOT device driver.

As an alternative to the WINPLOT device driver, SAS/GRAPH software also provides native device drivers for all HP plotters supporting HP-GL or HP-GL/2, and plotters from other manufacturers that support the HP-GL or HP-GL/2 language. SAS/GRAPH software also supports Houston Instruments plotters using the DMPL language and ZETA plotters that support the GML language.

Film Recorders

SAS/GRAPH supports any film recorder that has a Microsoft Windows driver available. This support is provided via the WINPRTC device driver. As an alternative to the WINPRTC device driver, SAS/GRAPH software also provides native device drivers that support the following film recorders:

Genigraphics Masterpiece Camera System with SCODL interface
Lasergraphics MPS 2000 film recorder with a Lasergraphics UI-100 or RASCOL rasterizer
Matrix QCR and PCR cameras with Matrix QVP, MVP, or Lasergraphics rasterizers
Polaroid Palette CI-3000 and CI-5000
Presentation Technologies Montage film recorder

Support may be available for other film recorders not listed here. Contact SAS Institute Technical Support for details.

Interfaces to Other Graphics Software

Included with SAS/GRAPH software is a series of drivers that can produce Computer Graphics Metafiles (CGM) in binary, character, and clear-text formats. These drivers can be used to transfer SAS/GRAPH output to other products that support CGM input, such as Word for Windows, WordPerfect for Windows, Harvard Graphics, and Lotus Freelance, or to devices that can process CGM input.

SAS/GRAPH software can also generate encapsulated PostScript vector files, which can be exported to word processing packages such as Microsoft Word, WordPerfect, and several others.

SAS/GRAPH software can also generate Windows metafiles that can be exported to numerous packages including Microsoft Office, Lotus Smart Suite, and Perfect Office. Contact SAS Institute Technical Support for details.

Many other graphics and word processing applications can process files in Hewlett-Packard (HP-GL) format. The HPGL driver can be used to produce files that can be transferred to most applications that can process HP-GL files. In addition, there are drivers for PDF, PBM, PPM, GIF, JPEG, and PaintBrush image formats. SAS/GRAPH software can also export graphics in the following formats:

BMP - Microsoft Windows Bitmap
DIB - Device Independent Bitmap
EMF - Microsoft NT Enhanced Metafile
EPSI - Encapsulated PostScript Interchange
GIF - Graphics Interchange Format
JPEG
PBM - Portable Bitmap
PNG - Portable Network Graphics
PS - PostScript Bitmap
TIF - Tagged Image File Format
WMF - Microsoft Windows Metafile Format

In addition, SAS/GRAPH software can import graphics in the following formats:

BMP - Microsoft Windows Bitmap
DIB - Device Independent Bitmap
EMF - Microsoft NT Enhanced Metafile
EPSI - Encapsulated PostScript Interchange
GIF - Graphics Interchange Format
PBM - Portable Bitmap
PCD - PHOTO CD
PCX - PC PaintBrush
PNG - Portable Network Graphics
TGA - TARGA Format
TIF - Tagged Image File Format
WMF - Microsoft Windows Metafile Format
XBM - X Window Bitmaps
XWD - X Window Dump

Writing Your Own Device Driver

SAS Institute's Metagraphics driver facility can be used to develop driver support for virtually any device you choose. The Metagraphics driver facility is device-intelligent and supports most hardware features. A user-written program is required to translate the metafile into the appropriate graphics language recognized by the hardware. SAS/GRAPH software will, optionally, perform device I/O. Contact SAS Institute Technical Support for details.

The Macintosh Meta Application

The Macintosh Meta Application is a free program that can be installed on your Macintosh. A metafile produced by the SAS/GRAPH Metagraphics driver can be transferred to the Macintosh from your host system and viewed on the screen. Images can then be stored in PICT or clipboard format to be used by other applications or printed on an attached Apple LaserWriter (or compatible) printer. Images can be saved into the Macintosh clipboard and used by MacDraw and other Macintosh packages. Contact SAS Institute Technical Support for details.

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