

System Requirements

The SAS[®] System Release 6.12 (TS070) OS/2[®]

This document provides requirements for installing and running the SAS System for OS/2. 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
- 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/software/enclosures/system_req.html

or contact SAS Institute Technical Support (refer to Contacting SAS Institute Technical Support in the installation instructions included in your package).

For information about Year 2000 compliance, see <http://www.sas.com/techsup/download/technote/y2kcomp.html>.

Software Requirements

Operating System

- OS/2 3.0 (Warp and Warp Connect)
- OS/2 4.0 Warp

Hardware Requirements

Machines Supported

- Any PC using an Intel or Intel-compatible 80386 33 MHz or higher CPU, capable of running OS/2
- A 33 MHz or faster 80486 or Pentium machine improves performance

Floating Point Unit or Math Coprocessor

A floating point unit or math coprocessor (e.g., the Intel 80387 for 386 machines) is strongly recommended. Be sure to install a math coprocessor with the appropriate MHz rating.

A floating point unit or math coprocessor is assumed present in the PC and the SAS System is optimized for its presence. OS/2 provides floating point emulation software with decreased performance in the absence of a floating point unit or math coprocessor.

Memory Requirements

- 8 MB minimum
- 12 MB for mid-range use
- 16 MB or more for maximum performance, depending on your applications

The MEMMAN `config.sys` option should specify both SWAP and PROTECT. See the MEMMAN description in the OS/2 Command Reference.

- 8 MB of swapfile space
- 40 MB of swapfile space for maximum performance

See the SWAPFILE description in the OS/2 Command Reference.

Monitors Supported

- VGA
- 8514
- XGA
- SVGA
- EGA is not supported

Hard Disk Requirements

Refer to the **Space Requirements** section for details.

Devices Supported

- A mouse is required

Additional Features

Dynamic Data Exchange

Dynamic Data Exchange (DDE) allows for the exchange of data between the SAS System and any other application supporting DDE on OS/2 or WIN-OS/2.

Workplace Shell Support

The SAS System exploits OS/2's user interface, the Workplace Shell, by taking advantage of file drag-and-drop features, context-sensitive pop-up menus, and an iconic point-and-click graphical user interface.

Electronic Mail

`Send mail` is provided as a menu item in the `File` pull-down menu. `Send mail` 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 VIM API is the only mail API supported. This requires installation of third party products such as Lotus ccMail 1.0+ or Lotus Notes 3.1+.

FTP, Socket, and Catalog Access Methods

Enhancements to the external access methods will bring remote data to local processing via the FTP and Socket access methods. FTP will allow access to remote external files using the TCP/IP ftp service. Access to remote data is further enhanced with the Socket access method, which brings TCP/IP socket programming to the SAS Data Step and SAS/SCL. In addition, SAS catalogs can now be read as external files using the new Catalog access method.

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 Lotus Notes 3.3x and Lotus Notes 4.0.

Reinstallation Support

Reinstallation support is provided as a component during a Custom install and requires 1 MB of disk space. Using reinstallation support on a shared network location enables the SAS System to be installable from that location. The installation media would not be referenced during future installs from the shared network location. `SETUP.EXE` is copied as part of reinstallation support.

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 this release of the SAS System for OS/2. Use this information to help you determine how much free disk space you must have available before you can install the SAS System.

Software Product	Disk Space (in MB)
Base SAS Software	16.3
Core of the SAS System (required)	58.8
SAS/ACCESS Interface to AS/400 Data Software	0.3
SAS/ACCESS Interface to DB2/2 Software	0.4
SAS/ACCESS Interface to ODBC Software	0.1
SAS/ACCESS Interface to ORACLE Software	0.7
SAS/ACCESS Interface to PC File Formats Software	1.3
SAS/ACCESS Interface to SYBASE and SQL Server Software	0.5
SAS/AF Software	1.0
SAS/ASSIST Software	7.7
SAS Business Intelligence 400 Software	0.2
SAS/CALC Software	2.7
SAS/CONNECT Software	1.8
SAS/EIS Software	26.8
SAS/ENGLISH Software	4.0
SAS/ETS Software	10.9
SAS/FSP Software	0.8
SAS/GIS Software	35.4
SAS/GRAPH Software	18.0
SAS/GRAPH Map Data Sets	39.9
SAS/IML Software	3.4
SAS/INSIGHT Software	2.8
SAS/LAB Software	3.9
SAS/MDDB Server Software	0.1
SAS/OR Software	19.0
SAS/PH-Clinical Software	26.8
SAS/QC Software	10.7
SAS/SHARE Software	0.3
SAS/SPECTRAVIEW Software	12.3
SAS/STAT Software	11.4
SAS/TOOLKIT Software	2.7
SAS/TUTOR Software: Fundamentals of the SAS System (CBT101)	4.0
SAS/TUTOR Software: Reading Raw Data and Formatting Values with the DATA Step (CBT102)	2.2
SAS/TUTOR Software: Creating, Modifying and Processing Variables with the DATA Step (CBT103)	2.0
SAS/TUTOR Software: Developing Custom Data Entry Applications (CBT104)	2.2
SAS/TUTOR Software: Creating and Enhancing SAS/GRAPH Output (CBT105)	3.6
SAS/TUTOR Software: Creating Tables with PROC TABULATE (CBT106)	2.1
SAS/Warehouse Administrator Software	15.3
TS070 Maintenance Files	73.6

Specific Product Requirements

SAS/ACCESS Interface to AS/400 Data Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to AS/400 software

DBMS Products Required:

The 16-bit version of one of the following releases of AS/400 support software is required:

- PC Support/400 Version 2, Release 1.1 or higher
- Client Access/400 Version 3, Releases 0.5 or higher

SAS/ACCESS Interface to DB2 Software

Products Required:

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

DBMS Products Required:

- DB2/2, Version 1 or subsequent versions

SAS/ACCESS Interface to ODBC Software

Products Required:

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

DBMS Products Required:

An OS/2 ODBC driver for the data source from which you want to access data is required. These drivers are often available from the DBMS vendor and other third party ODBC driver developers. The driver you choose may require additional DBMS software in order to access the data.

SAS/ACCESS Interface to ORACLE Software

Products Required:

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

DBMS Products Required:

SAS/ACCESS Interface to ORACLE software can be installed on either a full ORACLE RDBMS server node or on an ORACLE client node that has ORACLE SQL*Net support.

If you are installing ORACLE SQL*Net for OS/2, Version 1, one of the following configurations should be installed:

- ORACLE for OS/2 Required Support Files, Version 7.1 (Version 7.1.4.3.0 recommended) *and* ORACLE for OS/2 SQL*Net TCP/IP Client, Version 1.1 (Version 1.1.6.13 recommended) *or*

ORACLE for OS/2 SQL*Net SPX/IPX Client, Version 1.1 (Version 1.1.1.7A recommended) *or*

ORACLE for OS/2 SQL*Net NetBIOS Client, Version 1.1 (Version 1.1.1.8A recommended)

If you are installing ORACLE SQL*Net for OS/2, Version 2, one of the following configuration should be installed:

- ORACLE for OS/2 Required Support Files, Version 7.1 (Version 7.1.4.3.0 recommended) *and* ORACLE for OS/2 SQL*Net Client, Version 2.1 (Version 2.1.4.0 recommended) *and* ORACLE for OS/2 TCP/IP Protocol Adapter, Version 2.1 (Version 2.1.4.0 recommended) *or*

ORACLE for OS/2 SPX/IPX Protocol Adapter, Version 2.1 (Version 2.1.4.0 recommended)

Note: If you are using ORACLE SQL*Net, Version 2.3 (from ORACLE, Version 7.3 Client Software, please contact SAS Institute Technical Support to obtain the latest support files.

SAS/ACCESS Interface to SYBASE and SQL Server Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to SYBASE and SQL Server software

DBMS Products Required:

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

- SYBASE Open Client, Release 4.6
- SYBASE System 10 Open Client, Release 10.0.3 or later

SAS/AF Software

Products Required for Build Mode:

- Base SAS software
- SAS/AF software
- SAS/GRAPH software (to create and display graphics objects)
- SAS/FSP software (to create and display SAS/FSP objects)

Products Required for Run Mode:

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

Printers:

- For printing graphics-based objects, a color or gray scale printer is required.
- Certain non-graphic objects may require SAS/GRAPH software to print depending on the object.
- The quality of printed output may be less than desirable on true pen plotter type devices.

Video Player Object in SAS/AF Software

Memory:

- 8 MB RAM required
- 16 MB RAM recommended

Hardware:

- 500 MB hard disk
- Minimum screen resolution - 640x480
- 486dx2-66 or higher
- Minimum of 256 colors
 - Video board supporting true color mode (65K or 16.7m colors) recommended
- Audio is not supported on OS/2

SAS/ASSIST Software

Memory:

- 12 MB minimum
- 14 MB recommended

Video Player in Base SAS Software

A Video Player utility has been added to Base SAS software with Release 6.12. 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.

Memory:

- 8 MB RAM required
- 16 MB RAM recommended

Hardware:

- 500 MB hard disk
- Minimum screen resolution - 640x480
- 486dx2-66 or higher
- Minimum of 256 colors
 - Video board supporting true color mode (65K or 16.7m colors) recommended
- Audio is not supported on OS/2

SAS/CONNECT Software

APPC Access Method

With the APPC access method, an OS/2 user is provided access to an SNA network. The APPC access method requires the following system software packages:

- IBM's CM/2, Version 1.11
- IBM's Communication Service for OS/2 WARP, Version 4 or subsequent versions
- Any OS/2 Version 2.11 or subsequent version's emulation program that supports IBM's APPC standard

EHLLAPI Access Method

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

- IBM's CM/2, Version 1.11
- IBM's PCOM (Personal Communications) 4.1 for 32-bit EHLLAPI support or subsequent versions
- Any emulation program that supports the EHLLAPI standard

NetBIOS Access Method

For the NetBIOS access method, SAS/CONNECT software provides access methods to support both the NETBIOS IBM 3.0 interface and the NETBIOS LAN Manager 1.0 Submit Interface.

The following products are supported for the NETBIOS IBM 3.0 Interface:

- IBM's LAN Enabler, Version 2.0 or subsequent versions
- IBM's LAN Server, Version 2.0 or subsequent versions
- IBM's NTS/2, Version 1.0 or subsequent versions

The following products are supported for the NETBIOS LAN Manager 1.0 Submit Interface:

- Novell's NetWare Requestor for OS/2 2.0
- IBM's LAN Enabler, Version 2.0 or subsequent versions
- IBM's LAN Server, Version 2.0 or subsequent versions

SPX Access Method

The SPX access method allows SAS System users to communicate across networks that use Novell's IPX/SPX protocol. The advantage over using Novell's NETBIOS access method would be slightly better performance and the ability to remove the NETBIOS device driver from memory. The SPX access method requires the following software:

- Novell's NetWare Requestor for OS/2, Version 2.10 or subsequent versions

TELNET and TCP/IP Access Methods

The following TCP/IP products are supported:

- IBM's TCP/IP, Version 3.0 or subsequent versions
- FTP Software's PC/TCP for OS/2, Version 1.3.1 or subsequent versions

SAS/EIS Software

Products Required for Build Mode:

- Base SAS software
- SAS/AF software
- SAS/FSP software
- SAS/GRAPH software
- SAS/EIS 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:

- 24 MB minimum
- 32 MB recommended

Hardware:

- 80386 33 MHz or higher with 8514, VGA, SVGA, or XGA monitor
- A 33 MHz or faster 80486 or Pentium machine improves performance
- EGA is not recommended

Printers:

- The quality of printed output may be less than desirable on true pen plotter type devices.

SAS/ENGLISH Software**Products Required:**

- Base SAS software
- SAS/ASSIST software
- SAS/ENGLISH software

SAS/GIS Software**Products Required:**

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

Printers:

- A color gray scale printer is required. The list of possible printers can be found in the **Graphics Hardware and Software Compatibility** section.
- The quality of printed output may be less than desirable on true pen plotter type devices.

Memory:

- 12 MB minimum
- 16 MB recommended
- 25 MB or more of swapfile space

Display:

- 16 color VGA required
- 256 colors recommended
- 256 colors are strongly recommended for the tutorial

SAS/LAB Software**Products Required:**

- Base SAS software
- SAS/GRAPH software
- SAS/LAB software
- SAS/FSP software is recommended but not required

SAS/MDDB Server Software

The memory requirements for SAS/MDDB Server software are dependent upon the complexity of the hierarchies generated. While the minimum requirement of 8 MB will allow the creation of simple hierarchies, more complex hierarchies will require additional RAM.

SAS/SHARE Software

APPC Access Method

With the APPC access method, an OS/2 user is provided access to an SNA network. The APPC access method requires the following system software packages:

- IBM's CM/2, Version 1.11
- IBM's Communication Service for OS/2 WARP, Version 4 or subsequent versions
- Any OS/2 Version 2.11 or subsequent version's emulation program that supports IBM's APPC standard

NetBIOS Access Method

For the NetBIOS access method, SAS/SHARE software provides access methods to support both the NETBIOS IBM 3.0 interface and the NETBIOS LAN Manager 1.0 Submit Interface.

The following products are supported for the NETBIOS IBM 3.0 Interface:

- IBM's LAN Enabler, Version 2.0 or subsequent versions
- IBM's LAN Server, Version 2.0 or subsequent versions
- IBM's NTS/2, Version 1.0 or subsequent versions

The following products are supported for the NETBIOS LAN Manager 1.0 Submit Interface:

- Novell's NetWare Requestor for OS/2 2.0
- IBM's LAN Enabler, Version 2.0 or subsequent versions
- IBM's LAN Server, Version 2.0 or subsequent versions

SPX Access Method

The SPX access method allows SAS System users to communicate across networks that use Novell's IPX/SPX protocol. The advantage over using Novell's NETBIOS access method would be slightly better performance and the ability to remove the NETBIOS device driver from memory.

The SPX access method requires the following software:

- Novell's NetWare Requestor for OS/2, Version 2.10 or subsequent versions

TCP/IP Access Methods

The following TCP/IP products are supported:

- IBM's TCP/IP, Version 3.0 or subsequent versions
- FTP Software's PC/TCP for OS/2, Version 1.3.1 or subsequent versions

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.

Memory:

- 12 MB minimum
- 14 MB recommended

Hardware:

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

SAS/Warehouse Administrator Software

Products Required for Build Mode:

- Base SAS software
- SAS/AF software (required only for API usage)
- SAS/FSP software

Products Required for Run Mode:

- Base SAS software
- SAS/FSP software
- Other products depending on application (e.g., SAS/ACCESS software for access to DBMS tables, SAS/CONNECT software for access to remote data, or SAS/AF software to access warehouse via method calls)

Note: It is recommended that SAS/Warehouse Administrator software be run on a minimum hardware configuration of 133 MHz processor, 24 MB memory, with a VGA, SVGA, or XGA monitor.

Printers:

- For printing graphics-based objects, a color or gray scale printer is required.
- Certain non-graphic objects may require SAS/GRAPH software to print depending on the object.
- The quality of printed output may be less than desirable on true pen plotter type devices.

Graphics Hardware and Software Compatibility

Printers

SAS/GRAPH software supports any graphics printer that has an IBM OS/2 device driver available. This support is provided via the OS2PRTM (for monochrome printers), OS2PRTG (for printers that support gray-scale shading), and OS2PRTC (for color printers) device drivers.

As an alternative to the OS2PRTx 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, ThinkJet, 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 4695, 4696, 4697 (ColorQuick)
Tektronix 4691, 4692 and 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. For additional information on these drivers, contact SAS Institute Technical Support.

Plotters

SAS/GRAPH software supports any plotter that has an IBM OS/2 plotter driver available. This support is provided via the OS2PLOT device driver.

As an alternative to the OS2PLOT 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 an IBM OS/2 driver available. This support is provided via the OS2PRTC device driver. As an alternative to the OS2PRTC device driver, SAS/GRAPH software also provides native device drivers that support the following film recorders:

- General Parametrics Videoshow display system
- 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. For details, contact SAS Institute Technical Support.

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.

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 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
- EPSI - Encapsulated PostScript Interchange
- GIF - Graphics Interchange Format
- MET - OS/2 Metafile
- PBM - Portable Bitmap
- PS - PostScript Bitmap
- TIF - Tagged Image File Format

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

- BMP - Microsoft Windows Bitmap
- CGM - Computer Graphics Metafile
- DIB - Device Independent Bitmap
- EPSI - Encapsulated PostScript Interchange
- GIF - Graphics Interchange Format
- MET - OS/2 Metafile
- PBM - Portable Bitmap
- PCX - PC PaintBrush
- TGA - Targa format
- TIF - Tagged Image File Format
- 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. For details, contact SAS Institute Technical Support.

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. For details, contact SAS Institute Technical Support.

SAS® and all other SAS Institute product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries.

IBM and all other International Business Machines Corporation product or service names are registered trademarks or trademarks of International Business Machines Corporation in the USA and other countries. Oracle and all other Oracle Corporation product or service names are registered trademarks or trademarks of Oracle Corporation in the USA and other countries. Other brand and product names are registered trademarks or trademarks of their respective companies.

® indicates USA registration.

Copyright © 2000 SAS Institute Inc. Cary, NC, USA. All rights reserved.