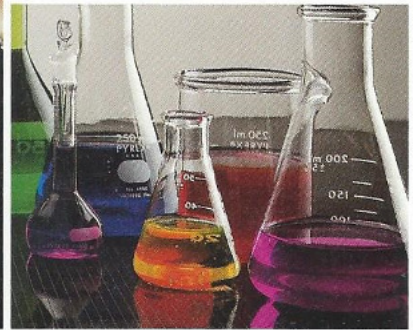


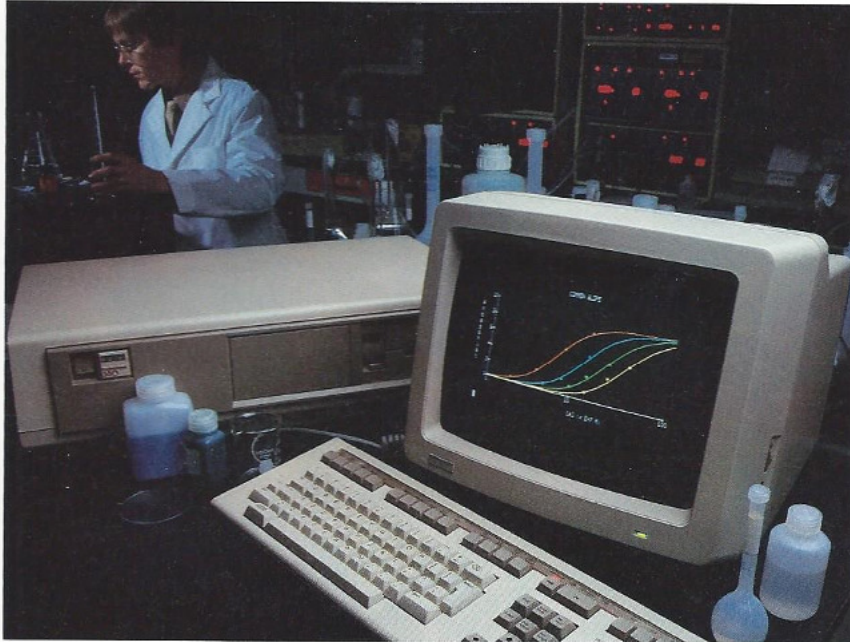
Professional Series™

SOLUTIONS IN THE LABORATORY



digital

The Personal Research System



*The Professional 300 Series:
a powerful personal research
system for scientists and
engineers.*

The Professional 300 Series turns your desk or laboratory bench into a powerful and versatile scientific workstation. From a single terminal, you can monitor and control instruments at the same time as you perform sophisticated graphic and statistical analysis of previous data. Besides cutting research costs, the Professional improves the efficiency and flexibility of your analytical techniques. The result: extra time and resources to explore new avenues of research.

Power and Compatibility

Since the Professional is designed around a PDP-11/23 processor and is VAX/VMS compatible, you can apply the power of a minicomputer to your research tasks. VAX compatibility means that you can gain easy access to other computational resources in your organization, and to applications proven in many years of technical use.

Communications Potential

The communications capabilities of the Professional extend far beyond its compatibility with VAX and PDP-11 systems. Through Digital's networking systems and a variety of IBM terminal emulation packages, you can communicate with your colleagues within the network environment, allowing you to share data resources and expensive peripheral devices.

Graphics Capability

High-performance bit-map graphics comes standard with the Professional. Together with optional color, this allows you to display your data effectively. In addition, the terminal emulation capability of the Professional provides you with all the features and functions of recognized industry standard terminals, such as the VT 100.

A complete personal research system, the Professional presents efficient and elegant solutions to the varying demands of scientific and technical environments.

Solutions for the Lab

Potential applications for the Professional 300 Series cover the whole spectrum of the sciences, ranging from environmental analysis, physics and engineering to chemistry, biology and medicine.

For example, earth scientists have recently used the Professional to predict the weather, and to monitor fishing patterns and the activity of volcanoes. Life science applications include the recording of living cell cultures, drug analyses and

the design of artificial limbs. The Professional is in daily use in the engineering world, as a teaching tool in university departments and for calibrating stresses on test materials.

In every field the scientist faces a number of basic problems and requirements. First, there's the need for reliable and efficient methods of acquiring data. A hardware option specially designed for the Professional 300 Series, the Real-Time Interface, provides a combination of key I/O capabilities, allowing you to collect raw data from passive data capture devices or complex lab instruments.

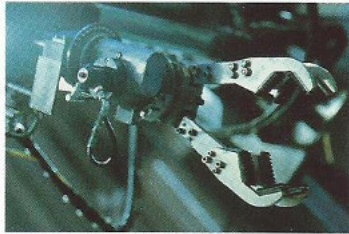
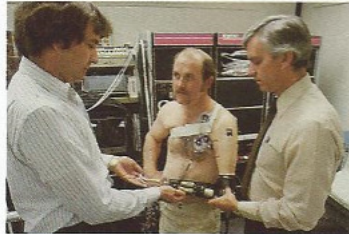
If you require effective data analysis without the need to write special programs, the RS/I software package is the answer. It will help you speed up routine operations and select the most effective statistical tests.

PRO/DATATRIEVE provides you with a powerful data management tool. PRO/DATATRIEVE is a full implementation of the DATATRIEVE-11 data management system available for the VAX and PDP-11 family. It features English commands and simplifies the task of querying and updating your database.

The CT*OS word processing package assists you in the final task of producing a research report. If your work demands special scientific characters, CT*OS supplies an alternate technical character font. CT*OS also includes the same menu interfaces and easy-to-learn features that users of Digital's word processing already enjoy.

With its large and growing library of software applications, the Professional 300 Series can help you in all of your daily activities, from data acquisition to finished report. The Professional speeds up routine operations and inspires creative new directions in your research and development.

Wherever challenges are met in the scientific community, the Professional 300 Series provides advanced and effective solutions. The wide range of applications include research in (top to bottom) astronomy, artificial limb design, petrochemicals, robotics and meteorology.



Professionally Performed Tasks

The power and adaptability of the Professional 300 Series are well-matched to the demands of the scientific and technical community.

For example, imagine that you're a research manager with a need to forecast laboratory expenses, prepare reports and proposals, and investigate overall trends in the work of your department. A variety of software packages available for the Professional will assist you in all these tasks. Spreadsheets such as SUPERCOMP-TWENTY allow you to keep track of salaries, inventory, lab supplies, and so on. The job of preparing technical reports is simplified by the CT*OS word processing system, which gives you the special symbols or characters you need. Finally, RS/1 offers you an efficient way of detecting new relationships among different types of data. It allows you to integrate many varied

approaches to statistical analysis and systems modelling, and to output the results in the form of bar charts, histograms, three-dimensional graphics, and so on.

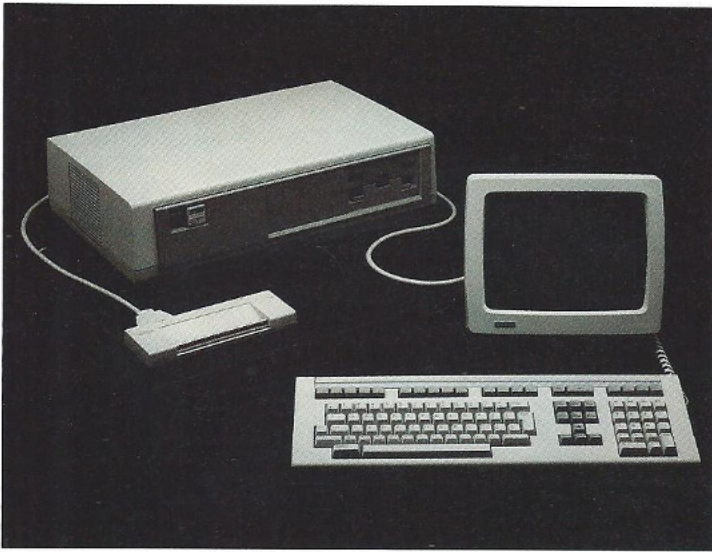
To take another case, suppose you are a pharmaceutical scientist using the Real-Time Interface with your Professional to acquire experimental data in the laboratory. With the data acquisition still continuing as a background task, you can communicate with remote databases such as Chemical Abstracts or GenBank to search and compare compounds and result patterns. Finally, CT*OS word processing assists you in writing up your experiment and communicating its results to your colleagues.

The Professional is a particularly effective tool for investigators at a remote location far removed from the departmental database. If you're an agricultural scientist at a farm facility, you can use the Professional to maintain animal and supply records and send the results of animal testing of compounds directly back to your research and development headquarters. No matter how remote your facility, the Professional keeps you in touch with your colleagues.

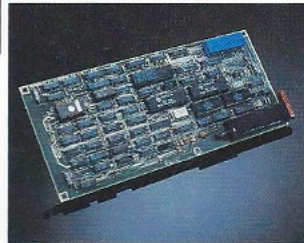
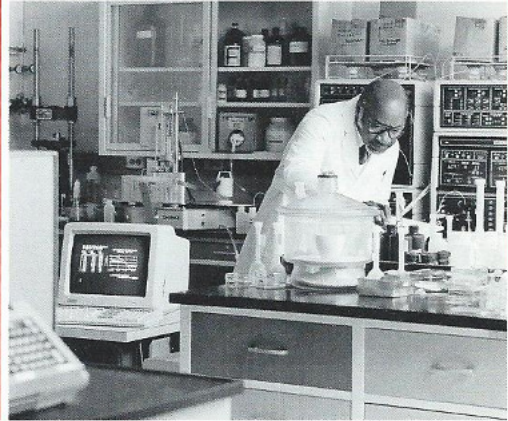
No matter what the specific needs of your research, the Professional 300 Series helps you control and simplify almost all aspects of data acquisition and data management, applications development and report generation.



Real-Time Solutions



The Real-Time Interface (right) is easily installed by the customer in one of the option slots of the Professional. It combines the I/O interfaces needed most in the research environment.



Many research programs involve collecting data and controlling time-dependent experiments. The Real-Time Interface (RTI) turns the Professional 300 Series into a versatile front-end controller of research instruments. It combines three of the most common I/O interfaces on a single module. These consist of:

- One IEEE/488 general-purpose interface bus port, allowing the Professional to act as a controller, talker and listener for up to 14 other compatible devices.
- Two EIA RS232/423-compatible serial asynchronous ports with user-selectable baud rates (50-9600) and serial word formats (data word length, number of

stop bits, parity) for compatible single-instrument and modem control. The two serial lines are independent of each other and can operate concurrently.

- One bidirectional TTL parallel port with 24 user-configurable lines for connecting the Professional to external devices.

You can use these interfaces singly, in combination, or all three at once. They allow the Professional to monitor and control passive data capture devices such as voltmeters and transient recorders, as well as complex instruments such as chromatographs, spectrophotometers, and automatic test equipment. The ports can also be adapted for specific customized applications with the aid of the Professional Real-Time Interface Library (PRTIL) and either the Professional Host Tool Kit or the PRO/Tool Kit. Like all other options for the Professional, the RTI has been designed to be easily installed by the customer.

The Integrated Lab Solution

A versatile, easily-learned software system, RS/1 integrates vital tasks performed by scientists, engineers and technicians in all fields of research and development. Eliminating the need to write — and rewrite — special programs, RS/1 gives you direct control over all aspects of data analysis, data management and report generation, using a series of prompt-driven dialogues. These help you choose the analytical technique best suited to your sampling method. The result is that routine manipulations of data are greatly simplified, speeding the evaluation of your research.

Currently used in hundreds of applications, ranging from commercial product design to environmental analysis, from quality control research to the mapping of integrated circuits, RS/1 for the Professional is the same full implementation available on VAXes and PDP-11s. RS/1 satisfies the needs of data entry, graphic display, statistical analysis and systems modelling. In the final editing stage, it helps you combine text, tables and graphics to produce presentation-quality reports.

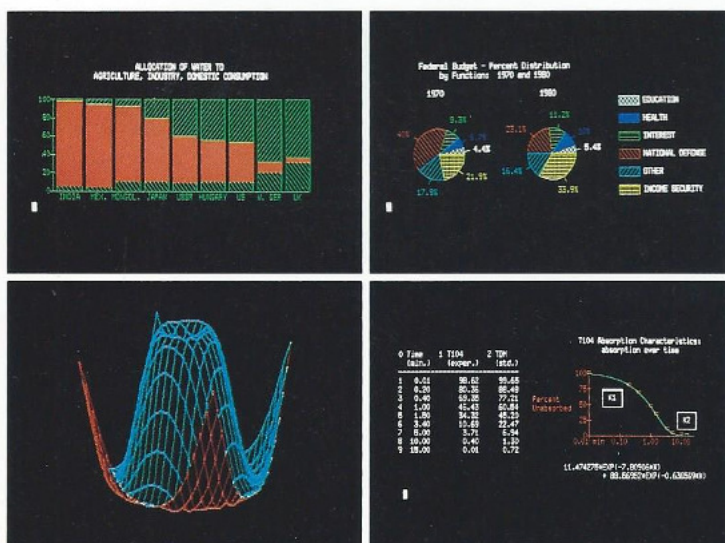
A wide choice of statistical tests is available. RS/1 allows you to execute them either by direct command or, if desired,

from menus that help you select the right test for your data. These include linear and non-linear regression, multivariate analysis, non-parametric statistics and contingency table analysis.

RS/1 tables can also be used to define models of complex systems. You can incorporate equations as well as data, and refer to parts of other tables or different models.

You can also extend the capabilities of RS/1 and tailor them to your specific needs through the Research Programming Language (RPL). This allows you to simplify routine data operations and to invent new analytical approaches. It provides an interface to other software systems such as DATATRIEVE, RMS files, and host languages (such as FORTRAN).

RS/1 is based entirely on simple English commands, so it's simple to learn and use. Even complex operations such as curve fitting or model building can be accomplished quickly and without any programming. RS/1 allows you to eliminate unproductive methods quickly, and gives you more time to explore new avenues of research.



RS/1 is a comprehensive, highly versatile data analysis and management system designed specifically for scientists and engineers. It lets you create and edit high-resolution graphic displays in a variety of formats: scatter plots, line graphs, histograms, bar graphs, pie charts, and so on.



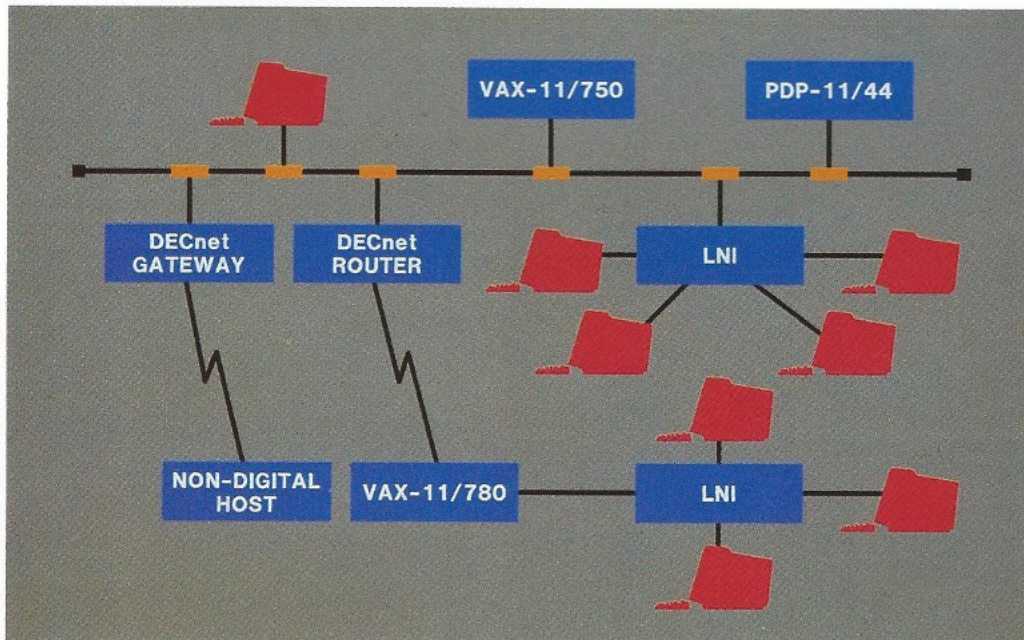
The Networking Potential

The Professional 300 Series offers communications capabilities far beyond the limits of a standalone personal computer. Digital's Network Architecture (DNA) and the many communications options now available allow you to connect your Professional quickly and conveniently to the computing resources of a single lab or an entire organization.

The foundation of DNA is DECnet, which supports both local and wide area networks. DECnet lets you communicate with host systems and with other workstations at a high data rate, binding a network together with the use of only minimal commands. By enabling you to access expensive resources such as high-speed printers or large databases, DECnet helps cut the cost of research and development.

The Professional 300 Series supports DECnet via the Ethernet local area network. DECnet brings improved control and flexibility to the laboratory. For example, let's assume you're collecting data from an instrument using the Real-Time Interface option of the Professional. If, at the same time, you connect the Professional to a central database on another computer via the DECNA Ethernet option, you can compare current test data with previously obtained or standard data. You can easily spot deviations and correct them before continuing the test.

A typical configuration of computing resources in the laboratory, showing Professional 350s, VAXes, and PDP-11's connected by Ethernet.



Communications Packages



The DELNI Local Network Interconnect (right) is used to connect one or more Professionals with multiple VAX and PDP-11 host systems. Such networks support many different communications software packages.



An extensive range of communications packages is currently available for the Professional 300 Series. The PRO/SNA package, for instance, allows you to communicate with an IBM host operating within a System Network Architecture (SNA) environment. The Professional emulates an IBM 3276 Model 12 controller, and can also function as an IBM display station, printer or remote job entry station.

PRO/Communications links you to time-sharing services, electronic mail, newswires, databases and area networks. You can transfer files to and from other Professionals or a Digital host. You can also communicate with a non-Digital host using terminal emulation.

PRISM (Professional Inter-System Management) allows you to query and update an IBM database, or transfer files and share resources, directly from your desktop.

The PRO-2780/3780 Emulator lets you access data on remote systems by simulating the protocol of an IBM workstation. You can transfer files as a background task while you run other applications on the Professional, or send or receive other information simultaneously.

Development Tools and Languages

The Professional Tool Kit provides a total environment for developing software applications to meet your specific needs. Designed for both the end user and the applications developer, the Tool Kit ensures that applications share the same simple interface as all the Professional system software. No matter what the original source of the application, it can be fully and consistently integrated into the friendly environment of the Professional. The applications developer saves time and costs as the PRO/Tool Kit gives access to powerful and proven Digital software development environments.

An outstanding feature is the compatibility of the higher-level languages offered on the PRO/Tool Kit with the RSX and VMS development environments. This compatibility enables you to use the Professional or *any* host running RSX or VMS software, so that designers fluent on different versions of these languages can quickly begin writing programs.

Two versions are available: the Professional Tool Kit and the Professional Host Tool Kit. The Professional Tool Kit provides RSX development capabilities directly on a Professional configured with the optional hard disk. One or more PRO/Tool Kit programming languages can be installed (along with the Tool Kit itself) on the hard disk. Then, after selecting the Tool Kit from a menu, you can write, compile, task build, execute and debug software programs on the Professional without the use of menus.

The Professional Host Tool Kit is used directly on a VMS or RSX-11M/M-Plus host. You develop the applications on the host and then transfer them by serial line to a Professional configured with the optional hard disk for execution and debugging.

SOFTWARE TOOLS

Among its many software tools, the PRO/Tool Kit includes the following:

- RSX-based utilities, including the EDT text editor, the librarian (LBR), and many others.
- A subset of Digital Command Language (DCL) including the single line editor and commands for file manipulation and logical name assignments.
- Debugging facilities include SHOW commands and Resource Monitoring Display (RMD).
- Indirect Command File Processor.
- Forms Management System (PRO/FMS-11).
- Record Management System (PRO/RMS-11).
- File Control Services (PRO/FCS).
- Callable Services: Print (CPRINT), PROSE Text Editor (CET), Sorting Task (PRO/SORT), Communications Facility (COMLIB).
- CORE Graphics Library (CGL).

DEVELOPMENT LANGUAGES

The following PRO/Tool Kit Program Development Languages are currently available:

- MACRO-11 (standard).
- PRO/Tool Kit BASIC PLUS-2 (optional).
- PRO/Tool Kit FORTRAN-77 (optional).
- PRO/Tool Kit COBOL-81 (optional).
- PRO/Tool Kit DIBOL (optional).
- PRO/Tool Kit PASCAL (optional).

In addition, Whitesmith's C Compiler is now available for both the PRO/Tool Kit and the Professional Host Tool Kit. You can use the C programming language to create applications directly on the Professional.

Range of Operating Systems

The Professional Operating System (P/OS) brings the development and multitasking capabilities of a PDP-11 to your desktop or laboratory bench. Based on Digital's popular RSX-11-M-PLUS operating system, P/OS provides a consistent menu-driven human interface that makes the Professional easy to learn and use. Alternatively, you can bypass the menu and go straight to the traditional Digital Command Language (DCL).

P/OS gives you access to all the familiar RSX tools, and supports the optional PRO/Communications package. This package provides terminal emulation and file transfer between Professionals and to PDP-11 and VAX hosts. With this option, the Professional gives you access to the programming capabilities and performance of a VMS or RSX-based host system.

If your specific needs involve operating systems other than P/OS, the following popular systems are available on the Professional:

RT-11

RT-11 is a compact, multitasking operating system familiar to most users of the PDP-11 family. It uses logical English commands and can be learned quickly. In addition, it gives the user access to a full range of system utilities that facilitate interactive program development, eliminating the need for a tool kit. You can take full advantage of the hardware design of the Professional, including the video bit map. In addition, a communications option (VTCOM) allows you to tie in any RT-11 system to a host such as a VAX.

VENIX

PRO/VENIX is a version of the popular UNIX V/3.0 operating system for the Professional 300 Series, with enhancements specially suited for the research needs of scientists and engineers. PRO/VENIX offers you a set of powerful utilities typically associated with full UNIX, as well as additional real-time capabilities, and special features such as asynchronous input/output for high speed data throughput; shared data memory and semaphores for rapid interprocess communication. It enables you to take full advantage of the graphics potential of the Professional through an integrated set of color graphics utilities. A communications package (VX) allows you to transfer files to other computers running a C compiler, while programming languages C, FORTRAN-77, PASCAL and BASIC are included. VENIX is more than just an operating system: it turns the Professional into a versatile workstation and applications processor in either the standalone or network environment.

UCSD p-System

A standard microcomputer operating system, the UCSD p-System offers software developers a sophisticated environment and allows end-users a wide choice of quality applications. The package includes an interactive operating system, screen-oriented editor, file-handler, p-machine emulator and a dynamic runtime binding facility for all separately compiled or linked programs. Installed as an application on the P/OS operating system, the UCSD p-System runs on the Professional configured with the optional hard disk, and brings hundreds of applications to your Professional with ease.



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