



Software Product Description

RSTS/E - Version 10.1

Software for the PDP-11

SPD 13.01.37

RSTS/E Version 10.1 is a member of a family of operating system and other software products produced by Mentec Inc. for the PDP-11 family of computers. It is available from Mentec Inc. subject to a software license issued according to standard terms and conditions.

Description

RSTS/E is a multi-user, general purpose timesharing system. Its uses include interactive timesharing, batch processing, indirect command file processing, program development using a variety of languages and tools, and a wide variety of special purpose applications. Up to 127 concurrent terminal users in both local and remote locations through multi-terminal services can interact with application tasks. Without multi-terminal services, 63 users are the maximum. Tasks can share computational, storage, and input/output services provided by the RSTS/E system.

The RSTS/E system is comprised of the RSTS/E monitor, device drivers, Commonly Used System Programs (CUSPs), and standard software components.

Features

- Interactive timesharing.
- Dynamic allocation of system resources.
- DCL (Digital Command Language).
- DCL command file processing.
- Command line editing and command recall.
- CCL system manager defined command interface.
- User and system logical names for devices and/or accounts.
- System security features.
- User and job privileges and resource quotas allocated to accounts as required.
- Batch services provide centralized background execution of DCL command files.
- Print services provide centralized background printing on terminal printers, line printers, or Terminal Server printers.
- Operator/Message Services provide dispatching and logging of operator messages and requests sent from users or programs.
- Extensive file processing including file sharing, protection mechanisms, and virtual (memory) disk support.
- Integrated system and account management using DCL.
- Magnetic tape processing (single or multi-volume).
- Terminal handler designed for interactive environments.
- Shared common code.
- Software-maintained cache of frequently-accessed disk data.
- Intertask communication.
- Disk file and device backup and restore utilities with streaming support for streaming tape drives supported by RSTS/E.
- Support for the RQZX1 SCSI adapter on Micro/PDP-1153+, Micro/PDP-11 /93, and upgraded 1/73 and 11/83 systems. Also, support for a specific set of Digital SCSI devices (RZ23L and RZ24L hard disks) using the RQZX1 SCSI adapter.
- Disk-to-disk volume copying between disks of different sizes and types.

- System reliability and maintainability features.
- DCL, RT-11, RSX, and BASIC-PLUS run-time system support.
- Program Development Tools.

Programs can be written in several languages. The following languages are included on RSTS/E systems:

- BASIC-PLUS
- MACRO-11 assembly language (RT-11 and RSX-11)

A complete list of languages that are optionally available for use on RSTS/E can be found in the Optional Software section of this SPD.

Tools are available to facilitate the design and incorporation and maintenance of forms into applications. The Forms Management System (FMS) is optionally available for the design, use, and maintenance of interactive forms.

Other utilities included as a standard part of the RSTS/E system are:

- EDT Digital's standard text editor
- PDP-11 SORT/MERGE Digital's powerful file sort utility and sub routine package
- RMS-11 Digital's standard Record Management System

Timesharing

Each user of a RSTS/E system is associated with a job on the system and usually interacts with that job through the use of a terminal. Jobs can also run detached (not using a terminal) or by use of pseudo keyboards. Although a RSTS/E system is limited to 63 jobs, some RSTS/E systems can support as many as 127 terminal users simultaneously. These limits (63 jobs and 127 multiple terminals) are not always achievable. Jobs such as Error Logger, Queue Manager, and batch jobs also affect the maximum limits. In addition, each job requires a minimum of 10 to 30 blocks of temporary disk storage.

Dynamic Allocation of System Resources

RSTS/E schedules CPU time and memory residency among jobs based upon their priority and processing requirements. Jobs are rescheduled based upon time-slicing or as a result of waiting for system services. A roundrobin algorithm is used to select eligible jobs with the same priority. Any user or program with the required privileges can alter Job priorities.

RSTS/E uses the memory management hardware capabilities to map a user's job area and some shared code into the user job's virtual address space. RMS-11 may be mapped into supervisor mode (for machines so equipped), allowing for additional space in the user job's virtual address space. Jobs can be swapped out to disk storage when the memory is needed for other jobs to run. A job's size can be expanded dynamically, subject to limits imposed by a user with the required privileges. For machines which do not support separate instruction and data (I&D) space, the limit for a job size is 64K bytes (32K words). For machines which do support separate I&D space, the limit is 128K bytes (64K words). To take advantage of separate I&D space, programs can be written in RSX MACRO-11 or several high level languages. BASIC-PLUS programs cannot be larger than 32K bytes (16K words). For RT-11 and MACRO-11 the maximum program size is 56K bytes (28K words).

User Command Languages

User commands to the RSTS/E system are handled and interpreted by one of the run-time systems capable of acting as a keyboard monitor.

The keyboard monitors which are included as standard components of RSTS/E are DCL, RSX, RT-11, and BASIC-PLUS. They interpret sets of system commands, that is, English language words followed by optional command parameters. These system commands allow users to perform fundamental functions required to use the RSTS/E system, such as logging on and off, copying files, and running programs. BASIC-PLUS and RT-11 have additional commands to perform actions appropriate for those environments.

Digital Command Language (DCL)

DCL is based upon the DCL available on most Mentec operating systems. It is similar to the DCL implemented on VMS*. In addition to fundamental operations such as listing directories and copying files, DCL includes features such as user-defined command synonyms, string and numeric symbol substitution, reading and writing files, system and account management functions, setting passwords, submitting to batch, setting terminal characteristics, and terminal activity logging. DCL is required as the system default keyboard monitor. DCL need not be memory resident unless a user is accessing it.

DCL command file processing is an extension of the DCL keyboard monitor. A DCL command file is a collection of DCL commands in a file. Conceptually, the commands in the file appear to the system as a series of commands which are presented to DCL from the keyboard. All command file processing is done within DCL with no additional keyboards or job slots required. Parameters can be passed to the command file processor at the time the file is invoked. DCL command files are considered to be

executable and can be ``run" or ``chained to" as programs, or they can be invoked with the DCL ``@" command.

In addition to standard DCL commands, the command file processor interprets a set of specialized commands that allows operations such as conditional branching, local and global symbols using 32-bit integers and up to 255 character strings in length, special purpose DCL functions, error handling, ``Control C" trapping, up to 13 nesting levels, selective display, optional time stamping and user prompting.

DCL command files are used to start up the system. System, group, and individual user environments can be customized through the use of DCL command files; they are executed as the user logs into the system.

A comprehensive set of HELP frames explaining the operation of most DCL commands is available using the HELP command. This information is also available in the documentation provided as part of the RSTS/E product.

* The terms OpenVMS and VMS refer to the OpenVMS Operating System.

Concise Command Language (CCL)

The CCL feature allows each installation's system manager to define additional system-wide commands to run system utilities as well as other user programs. Each CCL command definition specifies the full form of the command and its abbreviation.

Security and Privilege

Access to the system is controlled by the use of passwords 6 to 14 characters in length. Initial assignment of passwords is performed by the system manager. Each user, given the required privilege, can change the password assigned to their account. Passwords are usually stored in hashed form. This feature is available on a per account basis at the option of the system manager.

The system manager may optionally define a system password which must be entered before the user is prompted to log in to an account. This feature is available for different classes of access such as dial-up or network access. As a resource sharing system, RSTS/E gives every user access to the system peripherals and resources, as well as a wide range of additional capabilities. On some of these resources, usage restrictions can be imposed on a per user or per system basis.

RSTS/E provides 35 separate privilege attributes which can be assigned to any account on the system. Tasks resident on the system may require one or more of these attributes in order to run. The system manager can then restrict the accounts' privileges to requirements required by the users.

Print/Batch Services

These services provide centralized background printing and batch processing. Based on the availability of resources, print and batch requests are placed on queues for immediate or later processing. Queues can be assigned to a single print or batch server, or to multiple servers.

Print requests consist of one or more files to be printed and can be directed to a terminal printer, a line printer, or a Terminal Server printer. Print requests can include a form name to indicate printer requirements.

Batch requests consist of one or more DCL command files to be processed. Multiple batch servers can be defined to provide concurrent batch processing.

Operator/Message Services

Operator/Message Services provides a standard mechanism for users and programs to send messages and requests to a system operator. Messages and requests sent to an operator are broadcast to all defined operator terminals and optionally recorded in a log file for later viewing. Several CUSPs (LOGIN, LOGOUT, SHUTUP, BACKUP, and PBS) use the Operator/Message Services to log and notify operators of certain system events.

Requests messages that require an operator reply can be issued from DCL or within an application. An operator can answer the request, abort the request, or reply to the request while keeping it pending. The operator's reply is displayed on the sender's terminal, and can also be assigned to a DCL symbol for processing within a Batch or DCL command procedure.

File System

Disk files can be created, updated, extended, truncated, deleted, and renamed under program control, or can be created, deleted, and renamed using terminal commands. Files can be created and extended dynamically with the RSTS/E file system automatically allocating disk space wherever available. Alternatively, to enhance system performance, a file's location can be specified and/or a file can be pre-allocated to use physically contiguous space. A disk file's size is limited by the storage capacity of the volume on which it resides. One file cannot extend across multiple disk volumes.

Files can be accessed by multiple users simultaneously. When opened for shared update, multiple users can update the same file while it remains open. The file system's block interlock mechanism can be used to prevent different users from updating the same part of the file concurrently.

RSTS/E disk volumes, when used as file-structured devices, are either public or private. A public volume is the system disk or any volume initialized and mounted as a public volume. Other file-structured volumes are private. Files cannot span volumes. Access to a disk file is governed by its protection code, which specifies read and write access for the file's owner, users within the owner's group, and all other users. For executable files, the protection code specifies execute and read/write access for owner, group, and all other users on the system.

A utility (FIT) provides file transfer capabilities to and from volumes (including RX01/RX02 floppy diskettes) using RT-11 file structure and DOS (read-only) media. This is limited to disks up to 33.5M bytes in storage capacity.

For systems with memory in excess of the amount required during the normal operation of the RSTS/E system, RSTS/E supports a Virtual or memory resident disk. This disk appears no different to the user than any other disk; however, since it is actually an allocated block of memory, I/O to the virtual disk operates at memory speeds. When used as a public disk, data will never be placed on this disk by default; it must be explicitly specified. This disk can be used for most of the same purposes that a physical disk is used, but it can be especially effective for use in storing commonly accessed read-only user files or system files.

Account Management

DCL commands are provided to create and delete accounts, set account attributes, and display account information. Account templates can be created and used to set the defaults for a class of accounts.

Several different types of accounts can be defined. User accounts allow access to the RSTS/E system. Captive accounts cause the system to start up a specific application such as word processing or a menu. When the user leaves the application, the job is killed and the user is logged off. Guest accounts can be set up which cause the system not to prompt for the account password during login. Accounts can be designated as non-interactive which do not allow a user to log in.

Accounts have privileges associated with them. The privilege attributes assigned to an account determine what a user, logged into the account, can do on the system.

Accounts can be set up with an expiration date. After the expiration date, users cannot log in to the account. The account is not automatically deleted.

Magnetic Tape Processing

RSTS/E can be instructed to read and write tapes of a specific density such as 800, 1600, or 6250 BPI if the density is supported by the controller for the tape drive. Alternatively, the user can specify that either the minimum or maximum density supported by the controller be selected automatically.

Supported tape formats are DOS-11 and ANSI. DOS-11 format is used for interchange between PDP-11 and VAX systems running RSTS/E, RT-11, RSX-11M, RSX-11M-PLUS, IAS, and OpenVMS.

ANSI format is used for interchange with the previously mentioned systems as well as other computer systems. RSTS/E implements a subset of the ANSI format, defined by American National Standard Institute Specification X3.27-1978, which is used for interchange between systems that support the standard. When using ANSI labeling format, RSTS/E processes only volume-header, file-header, end-of-file, and end-of-volume labels. RSTS/E does not perform access checking. A tape volume is considered private to the job which has access to that volume. RMS uses ANSI tape labeling format exclusively. Files may be processed using F (fixed-length) or D (variable-length) record formats.

The RSTS/E BACKUP utility uses ANSI tape format.

Terminal Handling

The RSTS/E terminal handler is designed for interactive environments and features:

- Full-duplex communications
- Modem control
- Type-ahead with echo-on-read processing
- Programmable echo control
- Multi-terminal I/O for individual jobs
- Pseudo keyboard capability
- Auto baud detection
- LAT support

The echo control feature allows programs to handle terminal input one field at a time and to retain control of the screen display. This feature gives application programs the capability to use nonblock mode transfer terminals to simulate block mode input. RSTS/E does not support block mode transfer terminals.

Each RSTS/E system includes at least one terminal, the system console terminal, and potentially as many as 126 additional terminals. On systems purchased as Mentec supported, the console terminal must be either:

- A hardcopy device
- Any terminal supported by RSTS/E when a hardcopy device is available on the system

The multi-terminal service feature allows any job to control multiple terminals, up to the maximum number configured for the system, on one logical channel. This feature allows one program to control a number of terminals that are all performing the same function.

Pseudo keyboards are logical devices that have the logical characteristics of real, physical terminals but have no hardware associated with them. Pseudo keyboards have input and output buffers to which a program can send output, and from which it can receive input. Using a pseudo keyboard as a communications device, a user can write a program to control other jobs. Each RSTS/E system includes at least one pseudo keyboard. RSTS/E supports a maximum of 127 terminals, including LAT connections, and pseudo keyboards.

Terminal Servers

Support for Terminal Servers on Ethernet uses the Local Area Transport (LAT) protocol. DECnet/E software is mandatory for this feature. Supported connections include DECserver 90L, 90L+, 90TL, 100, 200, 250, 300, 500, 550, DECSA terminal servers, IBM[R] PC systems running DECnet-DOS, and VAXmate systems. Terminal Server support includes full access to printers and modems connected to Terminal Server ports.

RSTS/E does not include the ability to load DECserver software. An OpenVMS, RSX, or other operating system with that capability, is required to initialize Terminal Servers.

Some Terminal Servers offer multiple protocols for communicating with other systems. RSTS/E supports only the LAT protocol.

Shared Common Code

RSTS/E allows the sharing of code that is common to multiple jobs. The code that resides in the resident library must be written in the MACRO assembly language. On machines so equipped, the RMS-11 resident libraries may be accessed using supervisor mode. This allows for increased address space available to the user application.

It is possible to create cluster libraries; resident libraries that share the same address window in the user task's virtual address space.

Disk Data Cache

RSTS/E can minimize accesses to disks for frequently used data by keeping data in a software-maintained cache (a specially designated area of system memory space). The data retained in this cache can be restricted to disk directory blocks only, or it can include data from disk files. In the data from disk files, a user with the required privileges has the option to allow all disk files to be cached or allow only certain eligible files to be placed in the cache. Since the virtual disk is already in memory, information stored there is never cached.

It is recommended that data from disk files be stored in the software cache only on systems with greater than 512K bytes (256K words) of memory. Intertask Communication

RSTS/E jobs can communicate with each other by sending and/or receiving intertask messages under program control. Jobs can send messages to valid message receivers.

Disk File and Device Backup

RSTS/E provides the user with the ability for total or selective backup of accounts and files to disks or to magnetic tapes using DCL commands. This is performed through the use of multi-volume container files which may be placed on standard RSTS/E format disks or ANSI labeled magnetic tapes. Disk-to-disk image (volume) copying between any size or type disks is also supported (assuming the output volume is large enough to hold the used portion of the input volume).

RSTS/E BACKUP produces BACKUP sets which are subset compatible with the OpenVMS BACKUP and can read BACKUP sets produced by OpenVMS BACKUP. This provides an easy transfer of data between machines running these two operating systems.

RSTS/E BACKUP provides support for streaming tape drives. See Table 2 (Supported Processor Information) for a list of tape drives which BACKUP supports in streaming mode.

System Reliability and Maintainability

The error logging mechanism in RSTS/E records certain classes of hardware errors in a disk file. The system manager can print the error log and analyze it on-line.

If a nonrecoverable hardware or system software error causes a system crash, RSTS/E will attempt to produce a crash dump and then attempt to reload the system and do a "cold restart." The automatic restart capability is enabled at the system manager's option.

The system manager can check the reliability of most peripherals online by running the Device Test Package.

Software integrity is kept at a high level by using software maintenance tools that allow the system manager to correct software components that are found to be in error. Most parts of the RSTS/E system are maintained by replacing the component in error. Some layered products are maintained by automatic patching procedures.

Program Development Tools

Program development on a RSTS/E system is facilitated by a wide selection of system utilities.

The Digital Text Editor (EDT) can edit all types of text files, including RMS fixed length record files, variable length record files, and stream files.

The RSX emulation provides a keyboard environment similar to that found in the RSX-11M-PLUS Operating System, by providing a subset of the RSX-11M-PLUS system directives. A TASK BUILDER and LIBRARIAN similar to those used by RSX are also included.

The RT-11 run-time system provides an environment similar to that found on the single-job monitor of the RT-11 Operating System, and provides a subset of the RT-11 directives. Also included are a LINKER and LIBRARIAN similar to those used by RT-11.

Standard RSTS/E Software Components

The following software components are supplied as integral parts of the RSTS/E Operating System:

- EDT
- RMS-11
- RMS Utility Programs
- PDP-11 SORT/MERGE
- BASIC-PLUS
- MACRO-11

EDT

EDT is a text editor that can be used to create a file, enter and manipulate text in the file, and save or delete work done during editing sessions. EDT works with any kind of text file. EDT can be used as either a keypad or line editor.

EDT offers features to make text editing easy and efficient. These features include:

- On-line HELP that can be used any time during an editing session
- Protection of editing sessions with journaling
- Initialization command file to specify editing characteristics
- Use of several files or parts of files at a time

Record Management Services (RMS-11)

RMS-11 includes a set of run-time service routines and utility programs that provide a data management subsystem. This allows a user to create and manipulate files, and create, access, and alter records within files.

RMS supports sequential, relative, and indexed file organizations.

The indexed file organization allows each indexed file to have one primary key and up to 254 alternate keys. In addition to random access based on key values, programs can access records in an indexed file sequentially in ascending order by key values.

RMS supports fixed length, variable length, variable length with fixed control field, and stream record formats.

Indexed files are restricted to either fixed or variable record formats. The stream record format is restricted to sequential disk files only. Languages that do not use RMS cannot process RMS files unless the record format is stream.

User programs are provided with logical data record access to RMS files through extended language syntax statements. The following functions are provided by RMS-11: OPEN, CLOSE, READ/GET, WRITE/PUT, REWRITE/UPDATE, and DELETE. The form of the statement is dependent upon the application language.

RMS-11 supports cluster libraries for sharing application virtual address space between a resident library and resident libraries of other software systems that support cluster libraries. The use of separate instruction and data space is allowed for machines which support this feature. The RMS-11 resident library may be accessed using supervisor mode on those machines which support this feature.

RMS-11 supports Digital Network Architecture (DNA) Data Access Protocol (DAP). This support allows access by RMS from a RSTS/E system with DECnet/E to files on remote DECnet nodes. The remote DECnet nodes may be RSTS/E, OpenVMS, RSX-11M or RSX-11M-PLUS, DECnet-DOS, or DECnet-ULTRIX systems. In general, remote file access appears the same as local file access to the programmer. The DAP resident library of RMS-11 must be accessed using user mode.

RMS Utility Programs

The following set of utility programs support RMS file-structured operations:

FILE DESIGN (DES) and FILE DEFINE (DEF)-Interactive utilities to assist the user in designing files for optimum performance.

RMS BACKUP (BCK)-Creates a backup copy of one or more RMS files from a disk to another disk or to magnetic tape.

RMS RESTORE (RST)-Recreates an original RMS file from the backup copy.

CONVERT (CNV)-Initially loads or adds records to an output file from input data recorded on a sequential, relative, or indexed file; creates, supersedes, or extends a sequential output file from an input file.

DISPLAY (DSP)-Lists attributes of RMS files and records.

INDEXED FILE LOAD (IFL)-Initial load utility for indexed files optimized for performance and space.

File Sort Utility (PDP-11 SORT/MERGE)

RSTS/E includes a file sort utility, PDP-11 SORT/MERGE. It accepts as input, up to ten RMS files and creates a second reordered RMS file. The input file can contain data stored in binary or ASCII format. The file organization can be sequential, relative, or indexed and the record format can be a fixed length, a variable length, or stream.

PDP-11 SORT/MERGE also includes a set of subroutines that are callable from programs written in one of the languages that use RMS.

BASIC-PLUS

The BASIC-PLUS language processor is comprised of a compiler and RunTime system. The BASIC-PLUS compiler produces a compact pseudo code that is interpreted by the Run-Time system. BASIC-PLUS programs can be saved in either source form or in compiled form (compact pseudo code).

The immediate mode feature of BASIC-PLUS allows single-line statements, typed without a line number, to be compiled and executed immediately. This is a useful feature in interactive debugging of BASIC-PLUS programs.

BASIC-PLUS can serve as a powerful system programming language. The extensive file processing capabilities of BASIC-PLUS allow users to take full advantage of RSTS/E file processing features. Most system features of RSTS/E are accessible via the flexible SYS system function call mechanism.

In addition to standard features, BASIC-PLUS features long variable names (with extend mode), IF...THEN...ELSE constructs, ON ERROR condition handlers, statement modifiers (such as IF, UNLESS, WHILE, UNTIL, and FOR), multi-line statements, program chaining and program debugging.

MACRO-11

The MACRO-11 assembly language, which uses the PDP-11 instruction set, can be used for development of programs and/or subroutines. The MACRO-11 assembler generates standard relocatable object modules from MACRO-11 source code.

SOURCE CODE INFORMATION

Source code is available in machine-readable format on 1600 BPI 9-track magnetic tape. Source kits include sources for the RSTS/E Monitor, RunTime systems, and Utilities.

This source code is provided on an ``AS IS'' basis without warranty of any kind, either express or implied.

Unsupported Software Components

There are components included with the RSTS/E product which are unsupported; however, they may be useful in specialized situations. They are not required for normal or recommended use of the system. A list of these components is included in the documentation supplied with the RSTS/E product.

HARDWARE REQUIREMENTS

A RSTS/E configuration must include:

- Any PDP-11 CPU from the list below (Table 1) with line clock or programmable (KW11-P) clock
- Console terminal-must be a hard copy device or VT100, VT200, VT300, or VT400 class terminal with a printer available on the supported system
- 248K bytes (124K words) of memory^[1]
- 10M bytes of disk space
- Software distribution device
- Tape drive or removable disk for backup

[1] Additional memory may be required to support large hardware configurations, DECnet/E or other optional software features. This may preclude the use of processors whose maximum allowable memory is 124K words.

SCSI Support:

- There is no SCSI device handler. The SCSI disk devices are treated as MSCP disks using DUDVR.
- RQZX1 SCSI adapter-Provides two ports that can be configured (via a hardware switch on the RQZX1 board itself) as the following:

2 disk ports

Each port has it's own CSR and is considered to be a separate controller.

Each disk port can support up to 4 disks (i.e. RX33, RZ23L, RZ24L).

Since the RQZX1 supports RX33 floppy disks, these disks must be counted in this maximum number of four. For example, one RX33 floppy attached to the RQZX1 disk port will allow up to three additional SCSI disks to be attached to that port.

The maximum number of RQZX1 adapters supported per system is one.

RSTS/E does not support any SCSI devices attached outside of the system box.

Note: **HARDWARE RESTRICTION:** Support for the RQZX1 adapter is limited to microcode version 2.1 or later.

OPTIONAL HARDWARE

Refer to Tables 1, 2, 3, and 4 for a list of all hardware supported by RSTS/E.

Hardware limitations may limit the number of devices and/or memory that a particular system can support.

SOFTWARE REQUIREMENTS

Support for Ethernet Terminal Servers requires DECnet/E V4.1 This is necessary even if only the Local Area Transport (LAT) protocol is to be used.

OPTIONAL SOFTWARE

The following is a complete list of languages that are optionally available for use on RSTS/E.

- PDP-11 BASIC-PLUS-2 for RSTS/E V2.7
- PDP-11 C/RSTS/E V1.2
- DECnet/E V4.1

Optional software products may require system resources (e.g., physical memory, disk space) over and above the requirements

for RSTS/E. If these extra resources are not available, severe system performance degradation can occur. Refer to the specific Software Product Description (SPD) for specific resource requirements for each product.

BASIC-PLUS-2 requires the support of the Record Management Services (RMS) software that is included with all RSTS/E systems. The use of RMS is optional for MACRO-11 assembly language programs. BASIC-PLUS does not use RMS.

DISTRIBUTION MEDIA

The distribution Media Codes used are described below. Specify the desired Media Code at the end of the Order Number, e.g. QR430-H5 = binaries on TK50 Tape Cartridge.

- 5 = TK50 Tape Cartridge
- M = 9-track 1600 BPI Magtape
- Z = No hardware dependency

ORDERING INFORMATION

License Options:

For Class H ^[1] Systems:

Single-Use License: QR430-UZ

For Class L ^[2] Systems:

Single-Use License: QY430-UZ

Media and Service Options:

Software Media/Documentation: QR430-H* Software Documentation only: QR430-GZ Software Product Services: QR430-**

[1] High-end systems, all UNIBUS models and systems

[2] Low-end systems; all Q-bus models and systems including KD11, KDF11, KDJ11 CPU modules; DCT11, DFC11, DCJ11 microprocessor chips

Source Options:

Source License and Sources Distribution ^[3] : QR430-EM

Sources Distribution: QR430-NM Note: The availability of these software product options and services may vary by country. Customers should contact their local Mentec office for information on availability.

[3] Sources included are RSTS/E Monitor, Run-Time Systems and Utilities

**Table 1:
Supported Processor Information**

Processor Type	MicroPDP-11/53/73/83/93	MicroPDP-11/23 11/23-PLUS	11/24
Processor Features	FPP (Std) FPJ (Std on /83/93)	KEF11-B (Opt CIS) KEF11-AA (Opt FPP) FPF11 (Opt FPA)	KEF11-B (Opt CIS) KEF11-AA (Opt FPP) FPF11 (Opt FPA)

Parity or ECC:			
Minimum Memory	256KB	256KB	248KB
Maximum Memory	4088KB	4088KB	3840KB
Cache Memory	None on 11/53/93 8KB (Std on 11/73/83)	None	None
Peripheral Interface	Q-bus	Q-bus	UNIBUS
Processor Type	11/34/34A	11/35/40	11/45/50/55/60
Processor Features	FP11-A (Opt FPP on 34A)	EIS (Req) FIS (Opt)	FPP (Opt) FPP (Std on /60) FP11-E (Opt FPA on /60)
Parity or ECC:			
Minimum Memory	248KB	248KB	248KB
Maximum Memory	248KB	248KB	248KB
Cache Memory	2KB (Opt on 11/34A)	None	None on 11/45/50/55 2KB (Std on /60)
Peripheral Interface	UNIBUS	UNIBUS	UNIBUS
Processor Type	11/44	11/70	11/84/94
Processor Features	FP11-F (Opt FPP) KE44-A (Opt CIS)	FPP (Opt)	FPP (Std) FPJ (Std)
Parity or ECC:			
Minimum Memory	512KB	512KB	1024KB
Maximum Memory	3840KB	3840KB	4088KB
Cache Memory	8KB (Std)	2KB (Std)	None on 11/94 8KB (Std on 11 /84)
Peripheral Interface	UNIBUS	UNIBUS MASSBUS	UNIBUS

Table_2:
Supported Peripherals

Processor	MicroPDP-11/23/53/73/83/93 11/23-PLUS⁽⁹⁾	PDP-11/24/34/34A PDP-11/35/40/45 PDP-11/50/55/60 PDP-11/44/84⁽⁹⁾	PDP-11-/70^[9]
Disk Units:			
RX50 ^[1]	16	16	16
RX33 ^[1]	16	-	-
RD31/2 RD51/2/3/4 ^[1]	16	-	-
RZ23L/24 ^[12]	16	-	-
RK05 (data disk only)	-	8	8 ^[5]
RK06/7 ^[2]	-	8	8 ^[5]
RL01/2 ^[4]	RL02	4	4 ^[5]
RH11 – RP04/5/6 RM02 ^[3]	-	16	-
RH70 – RP04/5/6 RM02/3/5/80 ^[3]	-	-	16
RA60 70/71/72/73 80/81/82 90/92 ^[1,2]	16	16	16
RC25 ^[1,11]	16	16	16 ^[5]

Tape Units	Up to 4: TSV05 or TK25	Up to 8: TE10, TU10, TS03 Or up to 4: TS11, TU80	UNIBUS Tapes Up to 8: TE10, TU10, TS03, Or up to 4: TS11, TU80
	Up to 2: TK50 ^[7] , TU81 ^[7] , TU81E ^[7]	Up to 2: TK50 ^[7] , TU81 ^[7] , TU81E ^[7]	Up to 2: TK50 ^[7] , TU81 ^[7] , TU81E ^[7]
		MASSBUS Tapes: Up to 8: TE16, TU16, TU45, TU77 (4 maximum)	MASSBUS Tapes: Up to 8: TE16, TU16, TU45, TU77 (4 maximum)
Distribution Media	1600 BPI tape TK50 cart.tape	1600 BPI tape TK50	1600 BPI Tape TK50
Terminals	Up to 127 ^[10] Supported Terminals	Up to 127 Supported Terminals	Up to 127 Supported Terminals
Interfaces	Up to 8: DZV11-C, DZQ11, DHV11, DHQ11, CXY08, CXA16, CXB16, DFA01 Up to 4: DHF11	Up to 31: DL11-A/B/C/D/E Up to 16: DH11, ^[6] DHU11, DZ11	Up to 31: DL11-A/B/C/D/E Up to 16: DH11, ^[6] DHU11, DZ11
Printers	Up to 8 LPV11 and supported printer	Up to 8 LP11 and supported printer	Up to 8 LP11 and supported printer
Modems	DF01-A, DF02, DF03, DF112 ^[8] , DF224, DFA01	DF01-A, DF02, DF03, DF112 ^[8] , DF224	DF01-A, DF02, DF03, DF112 ^[8] DF224
	Bell 103A, 212 Compatible	Bell 103A, 212 Compatible With DMC11/DMR11: DF126, DF127, DF129	Bell 103A, 212 Compatible With DMC11/DMR11: DF126, DF127, DF129
Other Peripherals:			
RX01/2 (Non RSTS File Structure)	8 X RX01	8	8
Card Readers		1 CM11 or 1 CR11 and 1 CD11	1 CM11 or 1 CR11 and 1 CD11

- [1] RSTS/E supports up to four MSCP class controllers per system. Each controller supports up to four MSCP class disk units.
- [2] These dual ported disks cannot be used from two systems simultaneously.
- [3] These dual ported disks can be accessed as READONLY from two systems simultaneously.
- [4] A minimum of two RL01 capacity disks plus a software distribution device are required.
- [5] On the PDP-11/70 when MSCP class disks (for example UDA50/RA81 /RA60/RC25) are present, combinations of these disks must be the only disks on the UNIBUS. [9] Mentec Services may not support some options on some CPUs.
- [6] DM11-BB is required for DH11 dial up. [9]Mentec Services may not support some options on some CPUs.
- [7] RSTS/E supports up to two TMSCP class controllers. Each controller supports one TMSCP class tape unit.
- [8] The DF112 DIALOUT capability is not supported on DH11 interfaces. [9]Mentec Services may not support some options on some CPUs.
- [9] Mentec Services may not support some options on some CPUs.
- [10] Up to 26 on MicroPDP-11/23 or 11/23-PLUS.
- [11] Supported only on systems upgrading; not supported on new installations.
- [12] RSTS/E supports up to four MSCP class controllers per system. Each controller supports up to four MSCP class disk units. These options are only supported using a RQZX1 controller.

Table 3:
Supported Terminals and Printers

Terminals	Printers
LA12, LA34, LA36, LA38, LA50, LA70, LA75, LA100, LA120, LA180, LA210, LA324	LP11 A/B/C/D/E/F/G/H/J/K/R/S/V/W/X/Y/Z LN01, LG01, LG02
VT52, VT55, VT100, VT101, VT102	(These LP11 options include LP11 interface plus designated printer)
VT125 (as VT100 in ANSI mode only) VT131 (as VT100 or VT102 only) VT220/40/41 VT320/30/40 (as a Level 2 (VT2xx) only) VT420 (as a Level 2 (VT2xx) only)	LQP02, LQP03, LN03, LN03 PLUS, LN06, LN08
DECmate I/II/III in CX Mode	
With VT102 subset terminal emulation: PC 300 Series (with P/OS) Rainbow 100 series	

Table 4:
Supported DECservers

DECserver90L	DECserver 90L+
DECserver 90TL	DECserver 100
DECserver 200	DECserver 250
DECserver300	DECserver 500
DECserver 550	DECSA Terminal Servers
VAXmate	IBM-PC_running_DECnet-DOS

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