



Software Product Description

PRODUCT NAME: VSI Pascal for OpenVMS

SPD DO-DPASPD-01A

DESCRIPTION

This document addresses VSI Pascal Version 6.2-125 for VSI OpenVMS Integrity and VSI OpenVMS Alpha.

VSI Pascal is an implementation of the Pascal¹ language that accepts programs compatible with either level of the ISO specification for Programming languages – Pascal ([ISO 7185-1987]) as well as (ANSI/IEEE 770X3.97- 1987). VSI Pascal also meets the Federal Information Processing Standard Publication ((FIPS-109)) requirements by accepting programs conforming to the ANSI standard. VSI Pascal also accepts many features from the Extended Pascal standard ((ANSI/IEEE 770X3.160-1989) and (ISO 10206)).

The compiler has been validated for both levels of the ISO unextended Pascal standard and for conforming to FIPS-109. Containing extensions to the standards, VSI Pascal generates optimized, shareable code that takes full advantage of the Alpha and Itanium hardware floating point and character instruction sets and the virtual memory capabilities of the OpenVMS Alpha and I64 Operating Systems. The language contains control statements, data types, and predeclared procedures and functions.

Major Pascal Language Elements:

- INTEGER, REAL, CHAR, BOOLEAN, enumerated, and subrange data types
- ARRAY, RECORD, SET, and FILE structured data types
- Schemata type denoting families of types
- STRING schema denoting variable-length character strings up to 65,535 characters
- FOR, REPEAT, and WHILE repetitive control statements
- CASE, IF-THEN, and IF-THEN-ELSE conditional statements
- BEGIN...END compound statement
- User-defined procedures and functions that can return structured types (other than file types)
- GET, PUT, READ, WRITE, READLN, and WRITELN input and output procedures
- Concatenation operator and set of predefined character string functions including INDEX, LENGTH, and SUBSTR
- Standard set of functions, procedures, and operators
- Module initialization and finalization
- Initial state specification
- Enhanced structured value constructors
- Implementation characteristics (MAXCHAR, MINREAL, MAXREAL, EPSREAL)
- OTHERWISE clause and case ranges for CASE statement and variant records
- Date and Time functions and procedures
- Short Circuit Boolean Operators (AND_THEN and OR_ELSE)
- Non-Decimal representation of numbers
- Exponentiation operator (**)

¹ K.Jensen and N. Birth, Pascal User Manual and Report, 2nd.ed., Spring-Verlag, New York 1974

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Pascal Extensions:

- DOUBLE (VAX D_floating and VAX G_floating on OpenVMS Alpha, and OpenVMS I64 and IEEE T_floating on OpenVMS Alpha and I64) data type that supports the Alpha double range and double precision floating point architectural features
- QUADRUPLE (IEEE X_floating on OpenVMS Alpha and I64) data type that supports the Alpha extended range and extended precision floating point architectural features
- Support for null-terminated strings via the C_STR_T predefined type and the MALLOC_C_STR, C_STR, PAS_STRCPY, and PAS_STR predefined functions
- VARYING data type denoting variable-length character strings up to 65,535 characters
- Language elements providing sequential and random access to RMS relative files, and sequential and keyed access to RMS multikey indexed files
- Optional attributes specification on constants, variables, types, type identifiers, routines, routine parameters, schema discriminants, and compilation units
- MODULE capability for combining procedures, functions, and other declarations for compilation separate from the main program
- ENVIRONMENT and INHERIT attributes to control separate and independent compilation
- UNSIGNED, CARDINAL, INTEGER_ADDRESS, INTEGERnn, UNSIGNEDnn, POINTER, and SINGLE predefined types
- VALUE initialization section and optional value initialization in declaration section program level
- External procedure and function declarations
- Nonpositional passing of parameters
- RETURN, BREAK, CONTINUE, EXIT and NEXT statements
- SELECT, SELECTONE statements
- Default values for parameters
- Double-quoted character strings with backslash constants
- 31-character identifiers that can include dollar sign (\$) and underscore (_)
- Conditional compilation facility including the %IF directive and the /CONSTANT command line qualifier to provide for compilation of code that has many variants or configurations.
- Many compiler directives such as %ARCH_NAME, %SYSTEM_NAME, %COMPILER_VERSION, %FILE, etc. to allow compile-time information to be inserted into the compiled program.
- Compiler directives such as %F_FLOAT, %S_FLOAT, etc. to allow fine grained control of floating literal formats

As a native-mode language, VSI Pascal is integrated into the Common Language Environment. This integration provides VSI Pascal users with:

- Support for OpenVMS interlanguage calling standard
- Access to all OpenVMS system services
- Access to the facilities of the OpenVMS Symbolic Debugger
- Callable interfaces to the OpenVMS Common Runtime Library
- Oracle CDD/Repository support
- Support for the Language-Sensitive Editor/Source Code Analyzer to provide error diagnostics to Language-Sensitive Editor component, cross-reference information for Source Code Analyzer component, and support for low-level program design, including the processing of pseudocode.
- Ability for functions to return structured types (other than file types)

Options available to Pascal users at compile time include:

- Run-time checks for array, character string, and subrange bounds
- Run-time checks for arithmetic overflow, valid case selector values, and null pointer variables
- Run-time checks for invalid declarations and illegal GOTO usage
- Generation of information for use by the OpenVMS Symbolic Debugger and the run-time error traceback mechanism
- Creation of an environment file facilitating separate compilation
- Cross-reference listing
- Creating in the listing file a representation of the object code generated by the compiler
- Printing of information-level messages including flagging uses of extensions to the ISO and ANSI Pascal standards

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SOURCE CODE INFORMATION

The following source code modules are provided on all available distribution media for this product:

KITINSTAL.COM, LIBDEF.PAS, MTHDEF.PAS,
PASCAL\$IVP.PAS, PASCAL.CLD, PASCAL.HLP,
PASDEF.PAS, PASSTATUS.PAS, SIGDEF.PAS,
DTK_MODULES.DAT, FRONT.PAS,
LIB_MODULES.DAT, MTH_MODULES.DAT,
NCS_MODULES.DAT, OTS_MODULES.DAT,
PASCAL\$D_FLOAT.PAS, PASCAL\$G_FLOAT.PAS,
PASCAL\$CMA_ROUTINES.PAS,
PASCAL\$CVT_ROUTINES.PAS,
PASCAL\$DTK_ROUTINES.PAS,
PASCAL\$LIB_ROUTINES.PAS,
PASCAL\$MTH_ROUTINES.PAS,
PASCAL\$NCS_ROUTINES.PAS,
PASCAL\$OTS_ROUTINES.PAS,
PASCAL\$PPL_ROUTINES.PAS,
PASCAL\$SMG_ROUTINES.PAS,
PASCAL\$SOR_ROUTINES.PAS,
PASCAL\$STR_ROUTINES.PAS,
PASSTR\$IVP.PAS,
PPL_MODULES.DAT,
RMSUSR.PAS,
SDLPASCAL.EXE,
SMG_MODULES.DAT,
SOR_MODULES.DAT,
STARLET.PAS,
STARLET_MODULES.DAT,
SOR_MODULES.DAT,
CONSTRUCTOR_1.PAS,
FUNCTION_CALLS.PAS,
HANDLER.PAS,
HELLOWORLD.PAS,
IMPLEMENTATION_MODULE.PAS,
INITIAL_STATE_1.PAS,
INITIAL_STATE_2.PAS,
INTERFACE_MODULE.PAS,
LIB\$FIND_FILE.PAS,
MAIN_PROGRAM.PAS,
RFA_READ.PAS,
SCHEMA_PARAMETERS.PAS,
SMG_EXAMPLE.PAS,
SYS\$ASCTIM_AND_GETTIM.PAS,
SYS\$CHECK_ACCESS.PAS, SYS\$DCLEXH.PAS,
SYS\$DEVICE_SCAN.PAS, SYS\$FAO.PAS,
SYS\$GETDVI.PAS, SYS\$GETJPI.PAS,
SYS\$GETQUI.PAS, SYS\$GETSYI.PAS,
SYS\$GETUAI.PAS, SYS\$PROCESS_SCAN.PAS,
SYS\$PUTMSG.PAS, SYS\$SNDJBC.PAS,
SYS\$TRNLNM.PAS, USE_XABDAT.PAS
PASCAL\$ACLEDIT_ROUTINES.PAS
PASCAL\$CLI_ROUTINES.PAS
PASCAL\$CONV_ROUTINES.PAS
PASCAL\$DCX_ROUTINES.PAS
PASCAL\$EDT_ROUTINES.PAS
PASCAL\$FDL_ROUTINES.PAS
PASCAL\$LBR_ROUTINES.PAS
PASCAL\$MAIL_ROUTINES.PAS
PASCAL\$PSM_ROUTINES.PAS
PASCAL\$SMB_ROUTINES.PAS
PASCAL\$TPU_ROUTINES.PAS
PASCAL\$SHOW_VERSIONS.COM
PASCAL\$SET_VERSION.COM
PASCAL\$DEFAULT_VERSION.COM

The source code modules are provided in order to install and describe the product. Modules include sample test program, help file, example files, and system definition inclusion files.

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

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Run-Time Library Redistribution

The VSI Pascal kit may include updated Pascal Run-Time Library shareable images. VSI grants the user a nonexclusive royalty-free worldwide right to reproduce and distribute the executable version of the Run-Time Library designated as PAS\$RTL.EXE and PAS\$MESSG.EXE (the "RTLs") provided that the user:

- Distributes the RTLs only in conjunction with and as a part of the user's software application product which is designed to operate in the OpenVMS environment;
- Does not use VSI's name, logo, or trademarks to market the user's software application product;
- Includes VSI's copyright notice for VSI Pascal on the user's product disk label and/or on the title page of the documentation for software application product;
- Agrees to indemnify, hold harmless, and defend VSI from and against any claims or lawsuits, including attorney's fees, which arise or result from the use or distribution of the software application product. Except as expressly provided herein, VSI grants no implied or express license under any of its patents, copyrights, trade secrets, trademarks or any license or other proprietary interests and rights.

HARDWARE REQUIREMENTS

Processors Supported:

- Integrity: Any Integrity system capable of running the VSI OpenVMS Integrity Operating System Version 8.4-2 or higher.
- Alpha: Any AlphaServer system capable of running the VSI OpenVMS Alpha Operating System Version 8.4-2L1 or higher.

Refer to the latest VSI OpenVMS Integrity or Alpha Software Product Description for information about supported servers.

DISK SPACE REQUIREMENTS

The following counts refer to the disk space required on the system disk. The sizes are approximate. Actual sizes may vary depending on the user's system environment, configuration, and software options.

	For VSI Pascal for OpenVMS Alpha Systems:	For VSI Pascal for OpenVMS Integrity Systems:
VSI Pascal Compiler:		
Disk space required for installation:	25,000 blocks (12.5 MB)	45,000 blocks (22.5 MB)
Disk space required for permanent use:	21,000 blocks (10.5 MB)	45,000 blocks (22.5 MB)
Starlet Library Files:		
Disk space required for installation:	15,000 blocks	15,000 blocks
Disk space required for permanent use:	15,000 blocks	15,000 blocks
VSI Pascal Example Files:		
Disk space required for installation:	150 blocks	150 blocks
Disk space required for permanent use:	150 blocks	150 blocks

OPTIONAL HARDWARE

Floating point intensive applications should be run on configurations with the appropriate hardware support for the floating point data types being used. Consult the Operating System Software Product Description for the Floating Point Accelerator or other floating point hardware appropriate for your configuration.

SOFTWARE REQUIREMENTS

On Integrity servers, VSI OpenVMS Integrity Version 8.4-2 or higher is the required operating system version for this product. On AlphaServer systems, VSI OpenVMS Alpha Version 8.4-2L1 or higher is the required operating system version for this product.

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SOFTWARE LICENSING

A software license is required in order to use the VSI Pascal software product.

- For Integrity servers, the license is a Concurrent Use license. Version update licenses are not available for the Integrity servers platform. Rights to use future revisions of VSI Pascal are available only through a Support Agreement or through a new license purchase.
- For AlphaServer systems, the license to use VSI Pascal is included in the ALPHA-LP license.

For more information about OpenVMS licensing terms and policies, contact your VSI account representative. Information is also available at the following website:

<http://vmsssoftware.com/services>

LICENSE MANAGEMENT FACILITY SUPPORT

VSI Pascal for OpenVMS supports the *OpenVMS License Management Facility*.

For more information about the License Management Facility, refer to the *VSI OpenVMS License Management Utility Manual* in the OpenVMS documentation set.

CLUSTER ENVIRONMENT

This layered product is fully supported when installed on any valid and licensed OpenVMS Cluster configuration, which are fully described in the *OpenVMS Cluster Software Product Description (SPD DO-VIBHAA-032)*. See the HARDWARE REQUIREMENTS section in this document for hardware requirements.

OPTIONAL SOFTWARE

- Oracle CDD/Repository for OpenVMS
- VSI DECset for OpenVMS includes:
 - VSI Language-Sensitive Editor/Source Code Analyzer (LSE/SCA) for OpenVMS Alpha
 - VSI Digital Test Manager (DTM) for OpenVMS Alpha
 - VSI Performance and Coverage Analyzer (PCA) for OpenVMS Alpha
 - VSI Code Management System (CMS) for OpenVMS Alpha
 - VSI Module Management System (MMS) for OpenVMS Alpha

For more information on VSI DECset for OpenVMS, refer to the Software Product Description (SPD DO-VIBHAA-036).

GROWTH CONSIDERATIONS

The minimum hardware and software requirements for any future version of this product may be different from the requirements for the current version.

ORDERING INFORMATION

For VSI Pascal on OpenVMS, licenses are available as electronic licenses (E-LTU) or physical licenses (P-LTU).

For VSI Integrity:

- | | |
|---|---------------|
| • VSI Pascal for VMS I64 Concurrent E-LTU | SL-LIPA0E-59V |
| • VSI Pascal for VMS I64 Concurrent P-LTU | SL-LIPA0P-59V |

For VSI Alpha:

- VSI Pascal for OpenVMS Included in the ALPHA-LP license bundle

SOFTWARE PRODUCT SERVICES

A variety of service options are available from VSI. For more information, contact your VSI account representative or distributor. Information is also available at the following website:

<http://vmsssoftware.com/services>

VSI Pascal for OpenVMS

SOFTWARE WARRANTY

This software product is provided by VSI with a 90-day conformance warranty in accordance with the VSI warranty terms applicable to the license purchase.

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