abel™ A SOFTWARE TOOL FOR PROGRAMMABLE LOGIC

GENERAL DESCRIPTION

ABEL™ is a complete logic-design software tool for programmable logic. ABEL combines a natural, high-level design language with logic reduction, simulation, and error checking in an integrated package to help a logic designer throughout the design process.

Natural Language

The ABEL design language lets you describe logic with Boolean equations, truth tables, or state diagrams, or with any combination of these. Meaningful names can be assigned to signals, signals can be grouped into sets, and macros can be used to simplify logic descriptions—all making your logic design easy to read and understand. ABEL is a natural language for designers.

Powerful Processing

ABEL also provides a processor that converts logic designs described with the design language into programmer load files used to program devices. The ABEL processor features a powerful logic reduction algorithm, extensive syntax and logic error checking, and simulation of designs before a part is ever programmed. The power of ABEL helps you use fewer and smaller programmable devices and virtually eliminates frustrating errors.

FEATURES

ABEL, The Design Processor

- Written in the C programming language for maximum portability and speed

- PRESTO logic reduction reduces the number of product terms required so designs fit into smaller devices

- Simulation uses test vectors to test designs before devices are programmed

- Automatic generation of design documentation

- Extensive error checking indicates what the errors are and where they occur

ABEL, The Design Language

- **Boolean Equations.** Logical, arithmetic, and relational operators can be used to write simple or complex Boolean equations. Equations are automatically converted to a sum-of-products form.

- **State Diagrams.** State machines can be described directly with ABEL state diagrams. State transitions are defined with IF-THEN-ELSE, CASE, and GOTO statements:

  Syntax: IF (condition) THEN state__x
                      ELSE state__y ;

  CASE condition__1 : state__y ;
        condition__2 : state__z ;

  GOTO state__x ;

- **Truth Tables.** Logic functions can be described with truth tables that specify input to output relationships for both combinational and registered outputs.

  Syntax: inputs -> combinational :> registered
                          outputs   outputs

- **Test Vectors.** Test vectors specify the desired operation of a design so that it can be simulated. Required outputs are listed for specific inputs in a truth table like form.

  Syntax: test inputs -> required outputs ;

- **Directives.** Directives can be written into the logic design that include other files, help to create complex test vectors, and control output listings.

- **Set Operations.** Signals can be grouped into sets and operated on as units. Sets can be used in Boolean equations, state diagrams, truth tables, and test vectors.

- **Preprocessor.** Macros can be defined to substitute text and arguments into a logic description. Combined with directives, macros are powerful tools for test vector generation.

Programmer Compatibility

ABEL produces output for Data I/O's Programmable Logic Development System (PLDS) or for any logic programmer supporting the following data transfer formats:

JEDEC ⌐ PALs®, IFL's
Motorola Exorciser ⌐
Intel Intellec 8/MDS ⌐ PROMs

System Requirements

ABEL operates on the following systems with the stated minimum requirements.

IBM® PC and Compatibles

VMS™-DOS or PC-DOS® operating system
1 double-sided, double density floppy disk drive (2 recommended)
128k RAM (192k suggested)
Distributed on 5.25″ DSDD floppy disks

VAX™

MS™ 3.0 or later operating system. Distributed on ANSI-format, 1600 BPI magnetic tape.
UNIX™ Berkeley 4.2 BSD operating systems. Distributed on TAR-format, 1600 BPI magnetic tape.

VALID™

SCALDsystems™ I, II, and IV
SCALDstar™ UNIX release 7.0. Distributed on TAR-format, 1600 BPI 1/2″ magnetic tape.

LOGIC DEVICES SUPPORTED BY ABEL

20-PIN PAL®	24-PIN PAL	IFL	PROM	LARGER PALs
10H8	6L16	82S100	32x8	32R16
10L8	8L14	82S103	256x4	
10P8	12H10	82S105	256x8	
12H6	12L10	82S151	512x4	
12L6	12P10	82S153	512x8	
12P6	14H8	82S155	1024x4	
14H4	14L8	82S157	1024x8	
14L4	14P8	82S159	2048x4	
14P4	16H6	82S161	2048x8	
16C1	16L6	82S167	4096x4	
16CP1	16P6		4096x8	
16H2	18H4			
16L2	18L4			
16H8	18P4			
16L8	19L8			
16P2	19L8L			
16P8	19R4			
16HD8	19R4L			
16LD8	19R6			
16R4	19R6L			
16R6	19R8			
16R8	19R8L			
16RP4	20C1			
16RP6	20CP1			
16RP8	20H2			
18P8	20L2			
E10P8	20L8			
E12P8	20L10			
E14P4	20P2			
E16P2	20P8E			
EP300	20R4			
	20R6			
	20R8			
	20RS4			
	20RS8			
	20RS10			
	20S10			
	20X4			
	20X8			
	20X10			
	22V10			
	PL839			

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For more information about ABEL or to order a $10 ABEL tutorial, consult your Data I/O sales representative.

DATA I/O