
IP Core Generator: Decoder

Features

- Accessible from the Macro Generator Dialog and HDLPlanner™ – Included in IDS for FPGA Devices and System Designer™ for AT94K FPSLIC™ Devices
- Variable Output Logic Level
- Variable Width of Input Vectors
- Variable Width of Output Vectors
- Variable First Value to Decode
- Start Value Radix Selection
- Optional Register Inputs
- Optional Register Outputs
- Register Only
 - Variable Clock Inversion Capability
 - Initialization Polarity Selection
 - Registers Initialization Selection

Description

The Decoder generator can be used to create a full or partial decode of the specified number of bits of input or output.



**Programmable
SLI
AT40K
AT40KAL
AT94K**

**Application
Note**

Rev. 2431B-1/02



Parameters

Parameter	Value	Explanation
Output	ActiveHigh	Output logic level will be held high for the decoded input
	ActiveLow	Output logic level will be held low for the decoded output
Input Width	Integer ≥ 0	Width of input vector. If this value is left at 0, the input width will be determined by the number of outputs specified.
Number of Values to Decode	Integer ≥ 0	Width of output vector. If this value is left at 0, the number of outputs will be determined by $2^{(1)}$ Input Width (i.e., all values will be decoded).
Starting at Value	Integer ≥ 0	First value to decode. When used in conjunction with the previous parameter, this can be used to specify exactly the range of outputs to decode. For example, setting the "Number of Values to Decode" parameter and "Starting at Value" to 2 would decode the values 2, 3 and 4.
Radix of Start Value	Binary	"Starting at Value" parameter is specified as a binary number
	Octal	"Starting at Value" parameter is specified as an octal number
	Decimal	"Starting at Value" parameter is specified as a decimal number
	Hex	"Starting at Value" parameter is specified as a hexadecimal number
InRegister	Boolean	Register inputs on the decoder
OutRegister	Boolean	Register outputs on the decoder

Note: 1. At least one of Decodes or Width must be greater than 0 (unless Value is specified). If input or output registers are selected, three additional parameters are available.

Register Parameters

Parameter	Value	Explanation
Invert Clock	Boolean	Invert the register clock
Initialization Polarity = Low	Boolean	Make register initialization active low
Initialization	Reset	Registers can be reset to zero
	Set	Registers can be set to one
	None	Registers are initialized automatically

Pins

Type	Name	Option	Explanation
In	DATA[Width - 1:0]	No	Decoder input pins, either Width bits wide or log2 Decodes bits wide.
Out	EQ[Decodes - 1:0]	No	Decoder output, either 2 Width bits wide or decode bits wide. If both Width and Decodes are specified, the output will start at the lowest count and work up.
In	CLK/CLKN	Yes	Clock pin used for synchronous control (noninverted/inverted)
In	RN	Yes	Reset (active low)

Truth Table

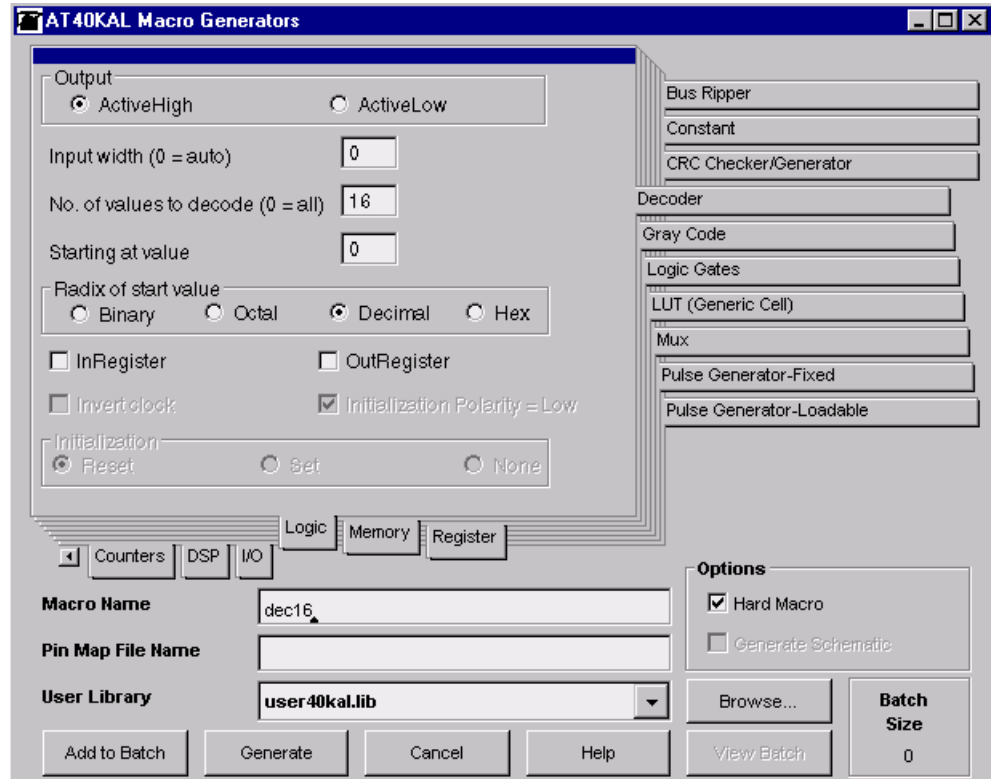
Option	Explanation
DATA[W - 1:0]	EQ[D - 1:0]
0	0...001
1	0...010
2	0...100
.	.
.	.
.	.

Statistics

Device	Name	Speed (MHz)	Delay (ns)	Cells	Size (x * y)
AT40K	dec16	339.0	3.0	16	1 x 16
AT40K	dec8	339.0	3.0	4	1 x 4
AT40KAL/ AT94KAL	dec16	492.6	2.0	16	1 x 16
AT40KAL/ AT94KAL	dec8	492.6	2.0	4	1 x 4

Figure 1 shows an example of the dec16 macro options.

Figure 1. Decoder Generator





Atmel Headquarters

Corporate Headquarters
2325 Orchard Parkway
San Jose, CA 95131
TEL 1(408) 441-0311
FAX 1(408) 487-2600

Europe

Atmel SarL
Route des Arsenaux 41
Casa Postale 80
CH-1705 Fribourg
Switzerland
TEL (41) 26-426-5555
FAX (41) 26-426-5500

Asia

Atmel Asia, Ltd.
Room 1219
Chinachem Golden Plaza
77 Mody Road Tsimhatsui
East Kowloon
Hong Kong
TEL (852) 2721-9778
FAX (852) 2722-1369

Japan

Atmel Japan K.K.
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
TEL (81) 3-3523-3551
FAX (81) 3-3523-7581

Atmel Operations

Memory

Atmel Corporate
2325 Orchard Parkway
San Jose, CA 95131
TEL 1(408) 436-4270
FAX 1(408) 436-4314

Microcontrollers

Atmel Corporate
2325 Orchard Parkway
San Jose, CA 95131
TEL 1(408) 436-4270
FAX 1(408) 436-4314

Atmel Nantes
La Chantrerie
BP 70602
44306 Nantes Cedex 3, France
TEL (33) 2-40-18-18-18
FAX (33) 2-40-18-19-60

ASIC/ASSP/Smart Cards

Atmel Rousset
Zone Industrielle
13106 Rousset Cedex, France
TEL (33) 4-42-53-60-00
FAX (33) 4-42-53-60-01

Atmel Colorado Springs
1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
TEL 1(719) 576-3300
FAX 1(719) 540-1759

Atmel Smart Card ICs
Scottish Enterprise Technology Park
Maxwell Building
East Kilbride G75 0QR, Scotland
TEL (44) 1355-803-000
FAX (44) 1355-242-743

RF/Automotive

Atmel Heilbronn
Theresienstrasse 2
Postfach 3535
74025 Heilbronn, Germany
TEL (49) 71-31-67-0
FAX (49) 71-31-67-2340

Atmel Colorado Springs
1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
TEL 1(719) 576-3300
FAX 1(719) 540-1759

Biometrics/Imaging/Hi-Rel MPU/ High Speed Converters/RF Datacom

Atmel Grenoble
Avenue de Rochepleine
BP 123
38521 Saint-Egreve Cedex, France
TEL (33) 4-76-58-30-00
FAX (33) 4-76-58-34-80

Atmel Programmable SLI Hotline
(408) 436-4119

Atmel Programmable SLI e-mail
fpga@atmel.com – fpslic@atmel.com

FAQ
Available on web site

e-mail
literature@atmel.com

Web Site
<http://www.atmel.com>

© Atmel Corporation 2001.

Atmel Corporation makes no warranty for the use of its products, other than those expressly contained in the Company's standard warranty which is detailed in Atmel's Terms and Conditions located on the Company's web site. The Company assumes no responsibility for any errors which may appear in this document, reserves the right to change devices or specifications detailed herein at any time without notice, and does not make any commitment to update the information contained herein. No licenses to patents or other intellectual property of Atmel are granted by the Company in connection with the sale of Atmel products, expressly or by implication. Atmel's products are not authorized for use as critical components in life support devices or systems.

Atmel® is the registered trademark of Atmel. FPSLIC™, HDLPlanner™ and System Designer™ are the trademarks of Atmel.

Other terms and product names may be the trademarks of others.



Printed on recycled paper.