

Register and Bit Name Definitions for the FPSLIC™ Family

Introduction

This application note contains files that allow the user to use Register and Bit names from the data book when writing assembly programs. To use the files, simply include them in the top of the source code. The files are named according to the following convention:

```
<Part Number>def.inc
```

As an example, AT94K programs should include the following assembler directive:

```
.include "AT94Kdef.inc"
```

In addition, the pointer registers R26 - R31 have been assigned names according to the following table.

Table 1. Pointer Name Definitions

Register	Name
R26	XL
R27	XH
R28	YL
R29	YH
R30	ZL
R31	ZH

For controllers with SRAM, the constants "RAMEND" and "FLASHEND" are defined. This number is useful when initializing the Stack pointer to point at the highest internal SRAM address. Finally, the interrupt addresses have been defined, and can be used together with the ".org" directive in the assembler to position an interrupt vector at the correct memory location. See the file listing for details on this.

To prohibit use of non-implemented instructions, all files contain a ".device" directive for the target FPSLIC MCU.

As new FPSLIC products are released, new files will be made available.

Usage

Bit names in the files are defined as numbers 0 - 7. The user should be aware of the difference between using bit masks as operands, and instructions that take bit numbers as operands.

Instructions that take bit masks are:

- CBR – Clear Bit in Register
- SBR – Set Bit in Register

Instructions that take bit numbers are:

- CBI – Clear Bit in I/O Register
- SBI – Set Bit in I/O Register
- SBIC – Skip if Bit in I/O Register Cleared
- SBIS – Skip if Bit in I/O Register Set
- SBRC – Skip if Bit in Register Cleared
- SBRS – Skip if Bit in Register Set
- BLD – Bit Load from T-flag
- BST – Bit Store to T-flag

To convert a bit number to a bit mask, use the shift left-operator ("<<") in the assembler. Observe that the "+" operator has precedence over "<<". See the following program example:

```
sbr    r16, (1<<SE)+(1<<SM)
out    MCUCR,r16    ;set SE and SM
                        ;in MCUCR
```



**10K - 40K Gates
of AT40K FPGA
with 8-bit AVR®
Microcontroller
and 36K Bytes
of SRAM**

Application Note





Atmel Headquarters

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

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

Atmel Rousset
Zone Industrielle
13106 Rousset Cedex
France
TEL (33) 4-4253-6000
FAX (33) 4-4253-6001

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

Atmel Grenoble
Avenue de Rochepleine
BP 123
38521 Saint-Egreve Cedex
France
TEL (33) 4-7658-3000
FAX (33) 4-7658-3480

Atmel FPSLIC Hotline
1-(408) 436-4119

Atmel FPSLIC e-mail
fpslic@atmel.com

FAQ
Available from Website

Fax-on-Demand
North America:
1-(800) 292-8635
International:
1-(408) 441-0732

e-mail
literature@atmel.com

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

BBS
1-(408) 436-4309

© Atmel Corporation 2000.

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.

Marks bearing ® and/or ™ are registered trademarks and trademarks of Atmel Corporation.

Terms and product names in this document may be trademarks of others.



Printed on recycled paper.