Zero-power Microcontrollers for Low-power and High-temperature Applications

Atmel offers a broad range of microcontrollers, including 4-bit to 32-bit ICs, for a wide variety of applications. The MARC4 4-bit microcontrollers are dedicated for any application requiring an extremely low current consumption for extended battery life.
In addition to this, the MARC4 microcontroller familiy operates within a wide temperature range of -40°C to +125°C. The flexible clock center makes it suitable for all kinds of remote control applications since it is able to switch to different internal and external clock sources on the fly.

Applications

Home Automation

- Remote Controls for: Door Opening Systems (Garage Doors), Heating/Air Conditioning Monitoring, Blinds, Roller Shutters, Wall Sockets, TV, Hi-Fi, VCRs, Emergency Systems for Elderly People
- Weather Station: Light, Humidity, Wind, Radiation

Toys and Sports

- Altitude Meters
- Bicycle Computers
- Inline Speedometers, Heart-rate Monitoring
- Computer Peripherals (Mouse, Keyboard, Joystick etc.)

White Goods

- Shavers
- Electrical Tooth Brushes

Industrial

- Measurement of: Light, Humidity, Wind, Radiation
- Production Monitoring and Controlling
- Remote Control (e.g. Cranes)
- Logistics/Stock Management (Wireless Handheld Terminals, e.g. Bar Code Readers)
- Telemetry

Automatic Meter Reading

- Measurement of: Gas, Water, Electricity, Heating

Automotive

- Remote Keyless Entry Systems
- Tire Pressure Monitoring

Alarm and Security Systems

- Wireless Warning Systems (Tension, Temperature, Heart Problems etc.)
- Alarm Systems (Smoke and Presence Detectors)

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Literature Requests
www.atmel.com/literature

Web Site
www.atmel.com

Rev.: 4618B-4BMCU-09/04/10M

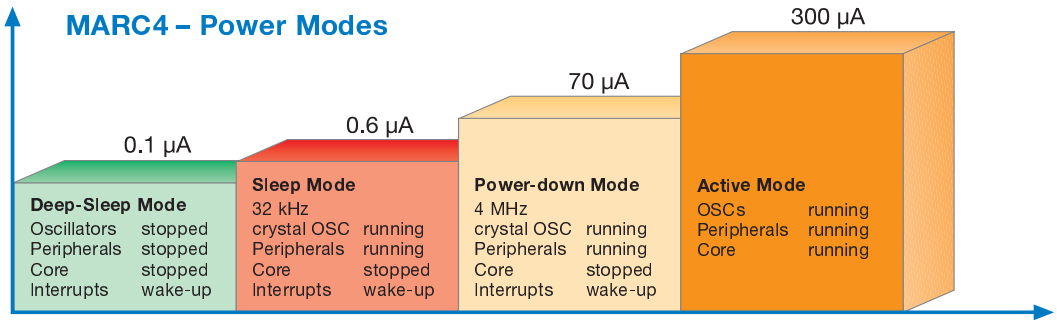
Key Features

- Stack Architecture
- V_{supply}: 1.8 - 6.5 V
- Temperature Range: -40°C to 125°C
- Flexible Clock Center: 5 Clock Sources Selectable on the Fly
- Fast: Down to 0.5 µs/Instruction, 2 Clock Cycles per Instruction
- HARVARD Structure – 3 Parallel Buses
- Various Power-saving Functions
- 72 RISC 8-bit Instructions
- 8 Interrupt Levels
- Voltage Monitoring and Brown-out Detector
- Mask-ROM and Flash Versions Available

RF MARC4

- One-package Solution with RF Transmitters for 315, 433, 868 and 915 MHz Bands

MARC4 – Power Modes



Development System

Manufactured by iSYSTEM

- Windows® 95/98/ME/200/XP and Windows NT®

Powerful Tool

- Real-time Trace
- Unlimited Number of Real-time Breakpoints
- Conditional Breakpoints
- 256 kB/1 MB Trace Memory

Comfortable Hardware

- Programmable Oscillator
- Pattern Generator
- Logic Analyzer

Development System with Target PCBs and Support Provided by Atmel

MARC4 Starter Kit

Software

- Windows-based Editor
- Integrated qFORTH Compiler
- Integrated Simple MARC4 Core Simulator (Only Core, no Peripheral Modules)
- Integrated Help Function with qFORTH Dictionary
- MTP (Flash) Programmer Software

Hardware

- MTP Programmer
- 5 Samples of MTP ATAM893
- Ready-to-run Application Board

MARC4 Product Overview

	ATAR080	ATAR090 ATAR890	ATAR092 ATAR892	ATAR510	ATAR862
ROM x 8	2048	2048	4096	4096	4096
RAM x 4	256	256	256	256	256
EEPROM x 16	–	C890: 32	C892: 32	–	32
IN/OUT	12	12	16	34	11
RF Transmitter	na	na	na	na	315, 433, 868, 915 MHz
Prescaler/ 8-bit Timer Watchdog/ Battery Low High I_{out} Serial I/O	1/1 Yes/Yes 8 x 20 mA 8-bit Sync.	1/1 Yes/Yes 8 x 20 mA 8-bit Sync.	1/2 Yes/Yes 8 x 20 mA 8-bit Sync.	2/2 Yes/– 8 x 20 mA –	1/2 Yes/Yes 8 x 20 mA 8-bit Sync.
Interrupt (Int./Ext.)	3/4	3/4	4/6	4/10	4/6
V_{DD} (V) I_{DD} Active (mA) I_{DD} Sleep (µA)	1.8 - 6.5 0.25 0.1	1.8 - 6.5 0.35 0.1	1.8 - 6.5 0.4 0.1	2.4 - 6.2 0.4 1	2.0 - 4.0 9.3* 0.45*
Package (plus Die)	SSO20	SSO20	SSO20	SSO44	SSO24
MTP (Flash)	ATAM893	ATAM893	ATAM893	ATAM510	ATAM862

* Note: Including RF