

# Flash Microcontrollers with Integrated USB Interface

REDUCE YOUR TIME-TO-MARKET  
WITH ATMEL'S USB PRODUCTS



*AT8xC5132 is not USB certified yet.*

Atmel® offer Flash microcontrollers with an integrated 2.0 Full-Speed compatible Universal Serial Bus (USB) controller and advanced on-chip peripherals.

AT89C5132 combines in a single chip interfaces for almost any consumer mass storage device and provides a full range of Man-Machine Interface capabilities.

AT89C5131 is a general-purpose USB microcontroller for PCs and the industrial equipment market.



Today, most new computers and peripherals are equipped with a USB connectivity.

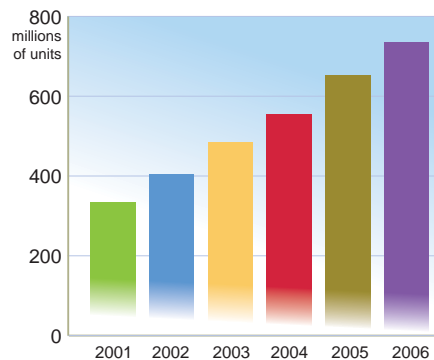
The overwhelming success of this simple universal serial PC interface is due to its plug-and-play and hot plugging capabilities.

A single USB port can be used to connect up to 127 peripherals devices, without having to add an adapter or even turning off the computer.

For seeable future, USB is expected to completely replace other serial, parallel and game interfaces in PC and peripherals markets.

USB connectivity can be found in a wide range of devices and markets nowadays.

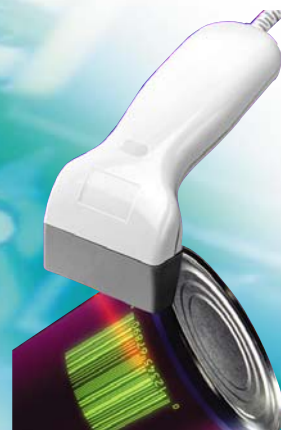
- Industrial Equipment & Data Acqquisition (bar code reader...)
- Security Applications (fingerprint reader, ID mouse, smart card reader...)
- Consumer Electronics (Flash disk...)
- Communication Equipment (mobile phone...)
- PC and Peripheral (multimedia keyboard, audio and game peripheral...)



Forecast for USB-enabled Devices  
Source: In-Stat/MDR 2002



Fingerprint Reader



Bar Code Reader

### Small Packages

- Micro Lead Frame Chip Scale MLF48 (7 x 7 mm)
- Low-Pin Count SO28

### In-sytem Programming Flexibility with USB

- Flash Code/Flash Boot/EEPROM
- Remote Programming/Field Upgrade
- Standard Bootloader Code: Device Firmware Update (DFU) Class



Flash Reader Writer

### Consumer Mass Storage Device Interfaces

- IDE/ATAPI for HDD, CD/DVD, CompactFlash™
- MultiMediaCard®



Game Peripherals

### Man-Machine Interface Capabilities

- Key Interface
- LED Drive
- LCD Interface
- System Reconfiguration without Disconnecting the USB Cable



USB Keyboard

### USB Controller with Isochronous & Bulk Modes

- 2.0 Full-Speed Compatible (12 Mbps)
- Easy High Speed Transfer
- Higher Data Transfer Rate

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		<b>AT89C5131</b>	<b>AT89C5132</b>	<b>AT83C5132</b>
<b>Memory</b>	Flash Code	32 KB	64 KB	–
	ROMCode	–	–	64 KB
	Flash Boot	3 KB	4 KB	–
	EEPROM	1 KB	–	–
	RAM	1.25 KB	2.3 KB	2.3 KB
<b>USB Controller</b>	Endpoints	7 (3 with double buffering)	4	4
	DPRAM	1.5 KB	168 Bytes	168 Bytes
<b>Self-programming Capability</b>	Supported Interfaces	USB, UART SPI	USB, UART SPI, IDE	USB, UART SPI, IDE
	<b>On-chip Peripherals</b>	16-bit Timers	3	2
PCA Channels		5	–	–
10-bit ADC		–	2 channels	2 channels
I2S		–	Yes	Yes
MMC, IDE		–	Yes	Yes
Max. Frequency		40 MHz @ 3V	30 MHz @ 3V	30 MHz @ 3V
Power Supply (V)		2.7 - 3.6	2.7 - 3.6	2.7 - 3.6
<b>Available Versions</b>	Temperature (°C)	-40 to +85	-40 to +85	-40 to +85
	Packages	PLCC52, MLF48 VQFP64, SO28	VQFP80 VQFP64	VQFP80 VQFP64

**Development Tools & Support**

<b>Starter Kits</b>	Atmel
<b>Compilers</b>	Keil™, IAR™, Raisonance, Tasking®, Crossware®, Hi-Tech™
<b>Emulators</b>	Ceibo, Hitex, Nohau, Phytex, Signum
<b>In-System Programming</b>	Atmel: PC-based FLIP
<b>Flash Device Programmers</b>	Advantech®, BP Microsystems, Data I/O®, Dataman, Hi-Lo Systems®, ICE Technology™, Elneq®, etc.



Ordering Information  
**For AT89C5131 Starter Kit**  
Part Number: AT89STK-05



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Part Number: AT89STK-04

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