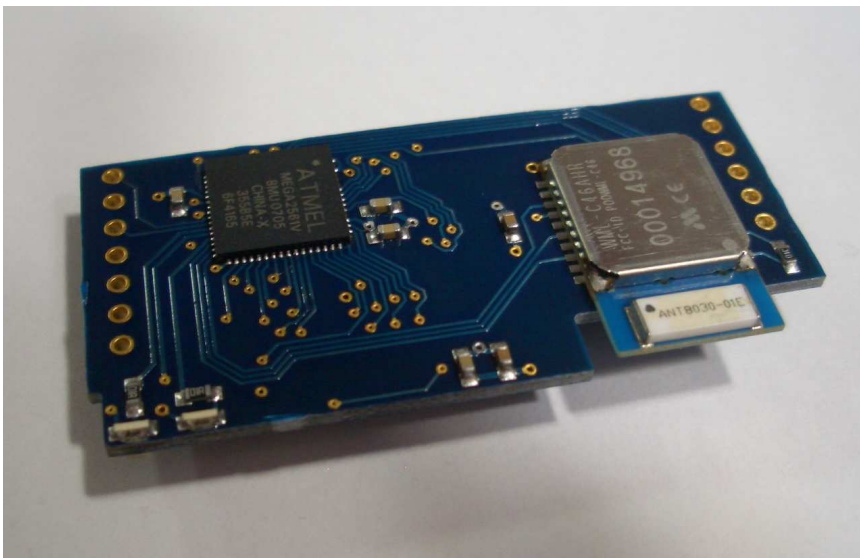


# AmbiComp

## Bluetooth Sandwich Module



The Bluetooth\* Sandwich Module is a component of the AmbiComp project and provides a Bluetooth interface. This allows short-range communication with other modules and devices (mobile phones, PDAs, etc.). On the microcontroller residing on the Bluetooth Sandwich Module runs the AmbiComp Virtual Machine (ACVM), which is capable of connecting with other components in order to set up a scalable AmbiComp network. Based on this network, small and medium-sized enterprises can develop their applications.



### Features

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- Class 2 Bluetooth module with integrated antenna
- Powerful RISC microcontroller
- Additional memory
- Power supply via the backplane
- Green and yellow LEDs to display module status
- AICU Bus interface for direct communication with other modules
- Java Virtual Machine

\* Bluetooth is registered trademark of Bluetooth SIG, Inc., Bellevue, Washington.

## Specification

### Microcontroller:

The *Bluetooth Sandwich Module* hosts an 8-bit RISC microcontroller, type AVR\* ATmega2561 from Atmel\* with a clock rate of 7,3728 MHz.

### Software:

On the microcontroller, a compact hardware abstraction layer (BIOS) enables easy and efficient access to all interfaces of the sandwich module. With the help of this BIOS, the AmbiComp-specific Java Virtual Machine (ACVM) may run programs across all modules of a sandwich stack. Several of these stacks, which are dislocated, are connected by the ACVM through the use of a powerful routing procedure (SSR). (More information on the ACVM and the program development for a

sandwich stack in Java using an Eclipse plug-in can be found in the relevant data sheets.)

### Memory:

The microcontroller hosts 256 KiB flash for BIOS, ACVM und Java program, 8 KiB SRAM and 4 KiB EEPROM. Additional 512 KiB SRAM are available through a separate integrated circuit.

### Bluetooth:

A Bluetooth module from Mitsumi provides a Bluetooth-2.0-Interface of Class 2.

The firmware for the BT module is available in two versions:

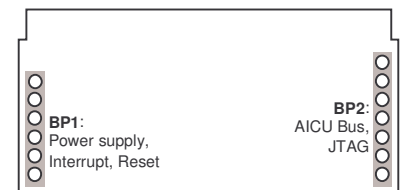
**HCI-FW:** All components of the BT stack are running on the microcontroller. In Java, an L2CAP interface is provided.

**SPP-FW:** Bluetooth is completely handled by the BT mod-

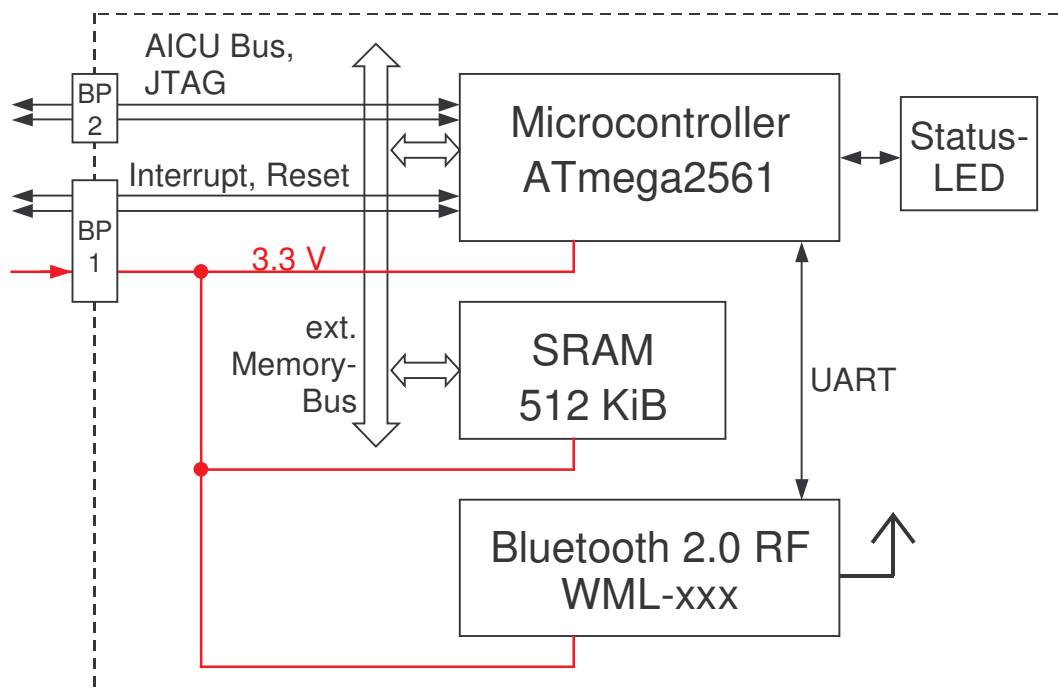
ule. In the microcontroller, only a UART-like interface is available (transparent cable replacement). This version is BT-conformant and is permitted to carry the BT logo.

### Backplane:

Via an AmbiComp-specific interconnection scheme ("backplane"), the *Bluetooth Sandwich Module* can be connected with other AmbiComp modules.



Detailed dimensioning and pin layout are contained in the data sheet "Sandwich Modules - General Information".



\* Atmel and AVR are registered trademarks of Atmel Corporation, San Jose, California, or its subsidiaries.

## Power Supply

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The power is provided by other modules via the backplane, which has a primary power supply.

The current consumption (at 3.3 V) depends on the Bluetooth activity:

Operating Mode	Current Consumption	
	typical	max.
Bluetooth not active	50 mA	70 mA
Bluetooth receiving	100 mA	140 mA
Bluetooth transmitting	90 mA	130 mA

The three status LEDs are not considered. Each of them consumes additional 10 mA.

## Mechanical Data

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The module measures 49.8 mm x 24 mm. The height is 4 mm.

## Environmental Conditions

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The *Bluetooth Sandwich Module* is designed for indoor use. The operating temperature range is -10 to +70°C.

The storage temperature range is -40 to +85°C.

The module conforms to the RoHS requirements.

## Order Codes

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Version with HCI-FW:  
100 001 19

Version with SPP-FW:  
100 000 11