Waspmote - Datasheet

Waspmote

General data:

Microcontroller: ATmega1281
Frequency: 8MHz
SRAM: 8KB
EEPROM: 4KB
FLASH: 128KB
SD Card: 2GB
Weight: 20gr
Dimensions: 73.5 x 51 x 13 mm
Temperature Range: [-20ºC, +65ºC]
Clock: RTC (32KHz)

Consumption:

ON: 9mA
Sleep: 62μA
Deep Sleep: 62μA
Hibernate: 0.7μA

Operation without recharging: 1 year *

* Time obtained using the Hibernate mode as the energy saving mode

Inputs/Outputs:

7 Analog (I), 8 Digital (I/O), 1 PWM,
2 UART, 1 I2C, 1USB

Electrical data:

Battery voltage: 3.3 V - 4.2V
USB charging: 5 V - 100mA
Solar panel charging: 6 - 12 V - 240mA
Auxiliary battery voltage: 3V

Built-in sensors on the board:

Temperature (+/-): -40ºC , +85ºC. Accuracy: 0.25ºC
Accelerometer: ±2g (1024 LSb/g) / ±6g (340LSb/g)
40Hz/160Hz/640Hz/2560Hz
# 802.15.4/ZigBee

<table>
<thead>
<tr>
<th>Model</th>
<th>Protocol</th>
<th>Frequency</th>
<th>txPower</th>
<th>Sensitivity</th>
<th>Range *</th>
</tr>
</thead>
<tbody>
<tr>
<td>XBee-802.15.4</td>
<td>802.15.4</td>
<td>2.4GHz</td>
<td>1mW</td>
<td>-92dB</td>
<td>500m</td>
</tr>
<tr>
<td>XBee-802.15.4-Pro</td>
<td>802.15.4</td>
<td>2.4GHz</td>
<td>100mW</td>
<td>-100dBm</td>
<td>7000m</td>
</tr>
<tr>
<td>XBee-ZB</td>
<td>ZigBee-Pro</td>
<td>2.4GHz</td>
<td>2mW</td>
<td>-96dBm</td>
<td>500m</td>
</tr>
<tr>
<td>XBee-ZB-Pro</td>
<td>ZigBee-Pro</td>
<td>2.4GHz</td>
<td>50mW</td>
<td>-102dBm</td>
<td>7000m</td>
</tr>
<tr>
<td>XBee-868</td>
<td>RF</td>
<td>868MHz</td>
<td>315mW</td>
<td>-112dBm</td>
<td>40km</td>
</tr>
<tr>
<td>XBee-900</td>
<td>RF</td>
<td>900MHz</td>
<td>50mW</td>
<td>-100dBm</td>
<td>10km</td>
</tr>
<tr>
<td>XBee-XSC</td>
<td>RF</td>
<td>900MHz</td>
<td>100mW</td>
<td>-106dBm</td>
<td>24km</td>
</tr>
</tbody>
</table>

* Line of sight and 5dBi dipole antenna

**Antennas:**
- 2.4GHz: 2dBi / 5dBi
- 868/900MHz: 0dBi / 4.5dBi

**Connector:** RPSMA

**Encryption:** AES 128b

**Control Signal:** RSSI

**Standards:** XBee-802.15.4 - 802.15.4 Compliant / XBee-ZB - ZigBee-Pro v2007 Compliant

**Topologies:** p2p, tree, mesh

![Figure 3: XBee](image)

![Figure 4: p2p](image)

![Figure 5: tree](image)

![Figure 6: mesh](image)
Bluetooth

**Bluetooth Chip:** eUnistone 31308/2  
**Version:** Bluetooth 2.0 + EDR (Configurable BT 1.2)  
**TX Power:** 2.5dBm  
**RX Sensitivity:** -86dBm  
**Antenna:** 2dBi / 5dBi  
**Antenna Connector:** RPSMA  
**Outdoor Range:** 250m  
**Indoor Range:** 30m  

**Actions:**  
- Scanning of new devices  
- Security - PIN mode  
- Adaptive Frequency Hoping (AFH)  
- Serial Port Profile (SPP)  
- Trusted nodes management

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Sensor Boards

- **Gases Board:** Carbon Monoxide (CO), Carbon Dioxide (CO₂), Methane (CH₄), Oxygen (O₂), Hydrogen (H₂), Ammonia (NH₃), Isobutane (C₄H₁₀), Ethanol (CH₃CH₂OH), Toluene (C₆H₅CH₃), Hydrogen Sulphide (H₂S), Nitrogen Dioxide (NO₂), atmospheric pressure, humidity and temperature.

- **Event Detection Board:** pressure, weight, curvature, stretch, vibration, impact, inclination, temperature, liquid level, light, PIR, Hall effect and presence of liquid.

- **Prototyping Board:** ADC (16b), amplification stages, current to voltage converter, relay (10A).

- **Agriculture Board:** soil and air temperature, air humidity, soil moisture, trunk, stem and fruit diameter, solar radiation - PAR, ultraviolet radiation - UV, leaf wetness, wind speed and direction, rainfall and atmospheric pressure.
**GSM/GPRS**

**Model:** HiLo (Sagem)

**Quadband:** 850MHz/900MHz/1800MHz/1900MHz

**TX Power:** 2W(Class 4) 850MHz/900MHz, 1W(Class 1) 1800MHz/1900MHz

**Sensitivity:** -106dBm

**Antenna connector:** UFL

**External Antenna:** 0dBi

**Actions:**
- Making/Receiving calls
- Making 'x' tone missed calls
- Sending/Receiving SMS
- Internet connection through TCP/IP and UDP/IP Sockets
- SMTP Service (sending emails)
- POP3 Service (receiving emails)
- FTP Service (downloading and uploading files)

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**GPS**

**Model:** A1084 (Vincotech)

**Movement sensitivity:** -159dBm

**Acquisition sensitivity:** -142dBm

**Hot Start Time:** <1s

**Warm Start Time:** <32s

**Cold Start Time:** <35s

**Antenna connector:** UFL

**External antenna:** 26dBi

**Available information:** latitude, longitude, height, speed, direction, date/time and ephemerids management.

**Programmable interruptions:**

- **Asynchronous**
  - Sensors (programmable threshold)
  - Low Battery (programmable threshold)
  - Accelerometer: Free-fall, impact (programmable threshold)
  - Arrival of SMS, calls and data

- **Synchronous:**
  - Watchdog: programmable alarms: from 32ms to 8s
  - RTC: programmable alarms: from 1s to days

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**Power supplies**

- 1150mA/2300mA Lithium Battery
- Solar Panel: rigid (12V – 200mA) and flexible (7,2 V – 100mA)
- USB (220V-USB, car lighter USB)
USB-PC interface

Model: Waspmote Gateway *
Communication: 802.15.4/ZigBee - USB PC
Programmable buttons and leds
* Included in the developers Kit

Compiler:
- IDE-Waspmote (open source)
- Language: C++
- Versions Windows, Linux and Mac-OS

Certifications

- CE (Europe)
- FCC (USA)
- IC (Canada)