

Table 1: Hardware Comparison of WSN Nodes

Sensor Node	iCube	Isense	Micaz	BTnode
Developer	TUC Telecom Lab	Coalesenses	Crossbow	ETH
		MCU		
IC	Silabs C8051F321	Jennic JN5148	ATmega128L	ATmega128L
Speed (MHz)	1.5 - 24	4 - 32	up to 8	up to 8
Architecture	8-bit 8051	32-bit RISC	8-bit RISC	8-bit RISC
Flash/ROM (KB)	16	128	128 + 4(EEPROM)	128 + 4(EEPROM)
RAM (KB)	2.304	128	4	4
Consumption Active (mA)	0.41/MHz	0.28/MHz + 1.6	5 @ 4MHz	5 @ 4MHz
		Radio		
IC	CC2500	Jennic JN5148	CC2420	CC1000
Interface	SPI	(Single IC)	SPI	SPI
Max Data-rate (Kb/s)	500	250	250	76.8
Modulation	OOK, FSK, MSK	O-QPSK (802.15.4)	O-QPSK, MSK	FSK
Frequency Band (GHz)	2.4	2.4	2.4	0.868
RSSI/LQI	yes	yes	yes	yes
Consumption TX (mA)	10 @-22dBm, 21.2 @0dBm	15 @0.5dBm	8.5 @-25dBm, 17 @0dBm	8.6 @-20dBm, 16 @0dBm
Consumption RX (mA)	13.3@250Kb/s	17.5@250Kb/s	18.8@250Kb/s	11.8@76.8Kb/s
Consumption Idle (mA)	1.5	-	0.42	0.096
Max Transmit Power (dBm)	+1	+2.5	+0	+10
Max Sensitivity (dBm)	-104@2.4Kb/s	-95@250Kb/s	-95@250Kb/s	-110@0.6Kb/s
Sensitivity@250Kb/s (dBm)	-89	-95	-95	-96@76.8Kb/s (max rate)
		Node Capabilities		
ADC	14 channels	4 channels	8 channels	8 channels
Recommended RTOS	Keil RTXtiny	custom	TinyOs	TinyOs
OTAP	yes (custom bootloader)	yes	yes	yes
RTOS-independent OTAP	yes (custom bootloader)	no	no	no
Batteries	2xAA	2xAA	2xAA	2xAA
		MCU+Radio Current		
CPU Sleep/Radio Off (μA)	0.1	0.1	15	15
CPU Idle/Radio Off (mA)	0.285	0.0012	4	4
Cpu@8MHz/Radio Off (mA)	3.28	3.84	10	10
Cpu@8MHz/Radio TX@250kbps (mA)	24.5 @0dBm	18.84 @0.5dBm	27 @0dBm	26 @0dBm
Cpu@8MHz/Radio RX@250kbps (mA)	16.58	21.34	28.8	21.8

Table 2: Humidity Sensors Comparison

Manufacturer	TUC Telecom Lab	Honeywell	Honeywell	Sensirion	Sensirion	Sensirion
Model	Custom-with HCH1000	HIH3610	HIH4000	SHT1x	SHT7x	SHT21
Range (%RH)	0-100	0-100	20-95	0-100	0-100	0-100
Supply Voltage (V)	2-18	4-5.8	4-5.8	5	5	2.1-3.6
Current Consumption (μA)	300	200	500	550	550	270
Accuracy (%RH)	± 3	± 0.2	± 3.5	$\pm 2 - 3$	$\pm 1.8 - 3$	± 2
Response Time (sec)	15	15	15	4	4	8
Output Type	Voltage Pulses (var. freq.)	Voltage	Voltage	Data (2-wire)	Data (2-wire)	Data (2-wire)
Cost (Euro)	6	30	24	19 - 22	22 - 25.5	15