

1. General Description

The Multi-material Moisture Meter is a universal electronic device for measuring moisture contents in wood, walls, building materials and also air humidity and temperature. The solution includes a BLE mobile app, a cloud-based data warehousing service with LoRa WAN and Wi-Fi connectivity, direct AP access with WEB based real time settings, monitoring and data logging.

The device is quite user friendly and provides high accuracy results thanks to a special microprocessor and high quality sensors. The measurement of moisture contents includes type of material and temperature compensation.



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2. Features and Benefits

■ System

- ◆ Xtensa® 32-bit LX6 microprocessor, up to 200 MIPS
- ◆ 448 kB ROM
- ◆ 520 kB SRAM
- ◆ 16 kB SRAM in RTC

■ Communication interfaces

◆ LoRaWAN™

- ◆ Type Sub-GHz
- ◆ Output Power 14.00(dBm)
- ◆ Frequency Range 868 MHz
- ◆ Input Sensitivity 148 (mVpp)
- ◆ Rx Input Sensitivity 48(dB)
- ◆ TX Current Consumption 40 mA (14dBm, 868MHz)
- ◆ RX Current Consumption 14.2 mA
- ◆ Environmentally friendly, RoHS compliant
- ◆ European R&TTE Directive Assessed Radio Module

◆ BLE

- ◆ Compliant with Bluetooth v4.2 BR/EDR and BLE specifications
- ◆ Class-1, class-2 and class-3 transmitter without external power amplifier
- ◆ Enhanced Power Control
- ◆ +12 dBm transmitting power
- ◆ NZIF receiver with -97 dBm BLE sensitivity
- ◆ Adaptive Frequency Hopping (AFH)
- ◆ Bluetooth 4.2 BR/EDR BLE dual mode controller
- ◆ Bluetooth Piconet and Scatternet
- ◆ Multi-connections in Classic BT and BLE
- ◆ Simultaneous advertising and scanning

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- ◆ Wi-Fi
 - ◆ 802.11 b/g/n
 - ◆ 802.11 n (2.4 GHz), up to 150 Mbps
 - ◆ TX/RX A-MPDU, RX A-MSDU
 - ◆ Automatic Beacon monitoring (hardware TSF)
 - ◆ 4 × virtual Wi-Fi interfaces Power control
 - ◆ Simultaneous support for Infrastructure Station, SoftAP, and Promiscuous modes
 - ◆ Antenna diversity
 - ◆ Integrated Power Management Unit (PMU) for versatile control of power consumption
 - ◆ Reduced power modes Sleep, Deep-sleep, Deep power-down
- Unique device serial number for identification

3. Applications

- Wood moisture contents measurements.
- Moisture contents in Walls
- Measurements of moisture contents in plywood (parquet) and concrete floors.
- Evaluation of moisture contents in buildings.
- Evaluation of atmospheric conditions (air humidity and temperature)

4. Technical Data

- Electric Conductivity (Impedance Sensor) Range: 0.0~60.0%;
- Temperature (Temperature Sensor) Range: -10.0~50.0°C

Materials Moisture Range:

◆ Material 1: Beech, Spruce, Larch, Birch, Cherry, Walnut	8.5~60.0 %
◆ Material 2: Oak, Cedar, Maple, Ash Tree, Citigroup, Tamarisk	6.8~53.4 %
◆ Material 3: Smoothing Cement, Concrete	0.9~24.5%
◆ Material 4: Anhydrite Screed	0.0~12.2%
◆ Material 5: Cement Mortar	0.7~ 9.2%
◆ Material 6: Lime Mortar	0.5~11.1%
◆ Material 7: Brick	0.0~17.8%

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- Resolution :
 - ◆ Material Moisture : 0.1%
 - ◆ Temperature : 0.1°C, 0.1°F
 - ◆ Humidity : 0.1%
- Accuracy (perform under temperature of 25°C) :
 - ◆ Temperature : ±2°C (-10°C~+50°C)
 - ◆ Humidity : ±5%(10...90%)
- Sample Interval :
 - ◆ Material Moisture Sample Speed : 240ms ;
 - ◆ Temperature Sample Speed : 240ms ;
 - ◆ Humidity Sample Speed : 240ms ;
- Operation Temperature : -10~50°C
- Storage Temperature : -40~60°C
- Power supply : NCR 18650 PF 3.7v/2.9A

5. Static Characteristics

$T_{amb} = 40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$, unless otherwise stated.

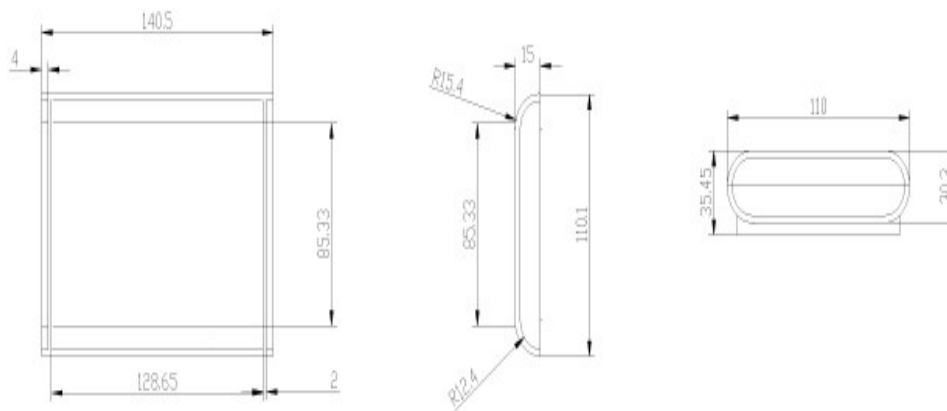
Mode	Temperature (°C)	Typical Current (mA)		
				VDD = 3.6V
Idle	-40 to +85			5.1
Operate	25			244.5
Sleep	-40			0.14
	25			0.16
	85			0.26

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5. Housing Dimensions [mm]



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