Moduino series

Energy-efficient ESP32-based Industrial Automation Controller

Moduino is a lightweight, but powerful energy-efficient and fully capable automation controller series - an industrial computer for remote data control and management, equipped with latest ESP32 compute module, wide range of serial, digital and analog inputs/outputs and wireless communication interfaces.

This cost effective solution is perfect for end-point devices. Moduino is powered by ultra-low power Dual-Core Tensilica LX6 240 MHz processor with up to 8MB pSRAM* and up to 16MB SPI** flash memory on-board. Integrated Wi-Fi/BLE modem and extra wireline/wireless interfaces make the Moduino micro-computer a versatile addition to Industrial IoT solutions offered by TECHBASE company.

Moduino devices can easily work remotely with existing ModBerry gateway for data accumulation and monitoring, to perform specific actions before sending the data to cloud services. The Moduino-ModBerry installation can work as standalone Ecosystem (for example via MQTT), providing fog-computing to any installation.

END-POINT SENSORS

The Moduino device is a comprehensive end-point controller for variety of sensors located throughout any installation. It fully supports temperature and humidity sensors and new ones are currently developed, e.g. accelerometer, gyroscope, magnetometer, etc.

SOFTWARE & OS

Use of ESP32-WROVER compute module adds the support for real-time operating systems (compared to most Raspberry Pi based Linux and Windows OS versions), and openness of the Espressif’s platform to Moduino industrial automation controller. Thanks to enormous community of ESP32 and Arduino users and developers, the Moduino can now adapt existing software solutions, tools and programming environments, for example:

/ MicroPython  
/ Arduino (C++)  
/ ESP-IDF (Espressif IoT Development Framework)  
/ Zephyr Project (scalable RTOS)  
/ Mongoose OS  
/ etc.

END-POINT SENSORS

Full support of temperature, humidity, pressure, accelerometer & light sensors with new ones in development, e.g. gyroscope, magnetometer, etc.

SMALL SIZE

Dimensions of the device allows the use in limited space and difficult industrial environments.
Specifications is subject to change without notice. Some of the features are optional. Technical parameters should be confirmed in the order details.
## SPECIFICATION

### COST-EFFECTIVE & WIRELESS INDUSTRIAL IoT

### ModuinoX1

**Chipset:**
- ESP32*

**Processor:**
- Dual-Core Tensilica LX6 240 MHz, RTC

**RAM:**
- 4 / 8 MB pSRAM**

**Flash:**
- 4 / 8 / 16 MB SPI***

**SD card:**
- -

**RS-232/485:**
- 1x RS-232/485

**Digital I/O:**
- 4x DIO
  - incl. DI: 2x DI (optional 4x DI), Protection: Over-Voltage 30VDC
  - incl. DO: 2x DO, Open Collector, Protection: Over-Voltage 30VDC
    - max. Current 500mA, peak min. 600W

**Analog Input:**
- 2x AI (0 ~ 10VDC) (optional)

**Analog Output:**
- -

**Ethernet:**
- 1x Ethernet 10/100 Mbps (optional)

**CAN:**
- -

**Wi-Fi:**
- 802.11b/g/n 16mbps

**Bluetooth:**
- Bluetooth v4.2 BR/EDR and Bluetooth Low Energy (BLE)

**WMBus (optional):**
- Wireless M-Bus 868 MHz and 169MHz band

**LoRa (optional):**
- Semtech LoRa transceiver SX1272, LoRaWAN stack, Class A and C devices

**Sigfox (optional):**
- TI CC1125 Narrowband Transceiver, Class 0 devices, Sigfox pre-certified (January 2017)

**LTE (optional):**
- Narrowband LTE UE categories M1/NB1, 34 bands supported from 699MHz to 2690MHz (Total worldwide support)

**ZigBee (optional):**
- Compatible with IEEE 802.15.4, ZigBee 2007 / PRO

**Ext. antenna:**
- SMA female antenna connectors (optional)

**Ext. modules:**
- + ExCard / mBus module support

**Battery:**
- Battery power support (optional)

**Power supply:**
- 6~30 V DC (depending on configuration)

**Casing:**
- ABS (default) or Aluminum (optional), DIN rail mount

**Working cond.:**
- -40 ~ 70°C, humidity 5 ~ 95% RH (no condensation)

**Dimensions:**
- ABS: 90 x 36 x 32 mm (LxWxH)
  - Aluminum: 95 x 35 x 41 mm (LxWxH)

### ModuinoX2

**Chipset:**
- ESP32*

**Processor:**
- Dual-Core Tensilica LX6 240 MHz, RTC

**RAM:**
- 4 / 8 MB pSRAM**

**Flash:**
- 4 / 8 / 16 MB SPI***

**SD card:**
- + microSD slot (optional)

**RS-232/485:**
- 1x RS-232/485 (default)

**Digital I/O:**
- 8x DIO
  - incl. DI: 4x DI (optional 8x DI), Protection: Over-Voltage 30VDC
  - incl. DO: 2x DO, Open Collector, Protection: Over-Voltage 30VDC
    - max. Current 500mA, peak min. 600W

**Analog Input:**
- 4x AI (0 ~ 10VDC) (optional)

**Analog Output:**
- 2x AO 10bit (optional)

**Ethernet:**
- 1x Ethernet 10/100 Mbps (optional)

**CAN:**
- 1x CAN (optional)

**Wi-Fi:**
- 802.11b/g/n 16mbps

**Bluetooth:**
- Bluetooth v4.2 BR/EDR and Bluetooth Low Energy (BLE)

**WMBus (optional):**
- Wireless M-Bus 868 MHz and 169MHz band

**LoRa (optional):**
- Semtech LoRa transceiver SX1272, LoRaWAN stack, Class A and C devices

**Sigfox (optional):**
- TI CC1125 Narrowband Transceiver, Class 0 devices, Sigfox pre-certified (January 2017)

**LTE (optional):**
- Narrowband LTE UE categories M1/NB1, 34 bands supported from 699MHz to 2690MHz (Total worldwide support)

**ZigBee (optional):**
- Compatible with IEEE 802.15.4, ZigBee 2007 / PRO

**Ext. antenna:**
- SMA female antenna connectors (optional)

**Ext. modules:**
- + ExCard / mBus module support

**Battery:**
- Battery power support (optional)

**Power supply:**
- 6~30 V DC (depending on configuration)

**Casing:**
- ABS (default) or Aluminum (optional), DIN rail mount

**Working cond.:**
- -40 ~ 70°C, humidity 5 ~ 95% RH (no condensation)

**Dimensions:**
- ABS: 90 x 71 x 32 mm (LxWxH)
  - Aluminum: 95 x 71 x 41 mm (LxWxH)

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Specifications is subject to change without notice. Some of the features are optional. Technical parameters should be confirmed in the order details.

* also available with ESP32-WROVER/WROVER-I/WROVER-B/WROVER-IB

** 4MB / 8MB RAM options available

*** 4MB / 8MB / 16MB Flash options available

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