



Relevant Device

This application note applies to the following device:

[BUONO UNO R3](#) , [BUONO UNO R3 Lite](#) , [BUONO UNO LC](#) , [BUONO UNO LC LITE](#)

[BUONO UNO CORE](#) , [BUONO RF UNO CORE](#) , [BUONO RF PA UNO CORE](#)

[Mega2560-CORE](#) , [Mega2560-CORE-Enthernet](#) , [DUE-CORE](#) , [DUE-CORE-Delux](#)

[MassDuino UNO LC](#) , [MassDuino UNO LC LITE](#) , [MassDuino UNO CORE](#) , [MassDuino RF UNO CORE](#) , [MassDuino RF PA UNO CORE](#)

[USB2Serial Light](#) , [UC-2102](#) , [UC-340G](#)

1 About INHAOS development boards series

INHAOS development board series are innovative and improved based on the Arduino development board, after a long period of market validation, INHAOS development boards is very stable , high quality and low price .

BUONO positioned as high-end products, native Arduino compatible design, improved power supply with a load capacity, and added some easy-to-use development features. Every BUONO product has it's Lite version , the Lite version is cancel the USB to UART circuit and us a 6pin UART interface for UART communication and uploading sketch. For example the BUO UNO R3 Lite is the lite version of BUONO UNO R3. The USB to UART interface are using same pinout as the Arduino USB2Serial Light cable , to fit difference board size, the 6pin connector has two size are 2.54mm and 2.0mm , INHAOS have rich choice for the USB to UART convertor, they are USB2Serial Light cable / UC-2102 and UC-340G.

MassDuino is a INHAOS self-developed products which compatible with Arduino IDE, MD-328D is a MCU which highly compatible with ATMega328P, Most MassDuino series development board is based on MCU, It is rich in resources, convenient development, chip prices are low and other advantages, Engineers to use the Arduino IDE for prototype verification, then can directly purchase IC to mass production, you can get a very high price and market competitiveness.

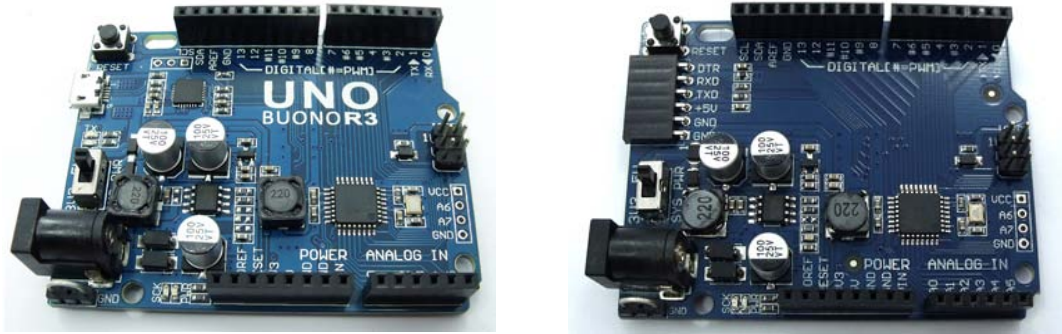
CORE series is compact series of high-density Arduino , such as Mega2560 and DUE , Because these Arduino board has very rich of hardware resources, development board size is relatively large, it's not easy to use , therefore the Arduino Mega2560 and DUE is not good sell in the market, So we developed the CORE series, mainly to reduce the board size, while increasing the number of commonly used peripherals such as we adds EEPROM for DUE-CORE, we adds 512KB SRAM and 8Mb SPI Flash for Mega2560-CORE-Enthernet , to fit in more high-end market applications.

2 Detailed information about INHAOS Development series

Now we briefly explain the feature of INHAOS development board series.



2.1 BUONO UNO R3 / BUONO UNO R3 Lite



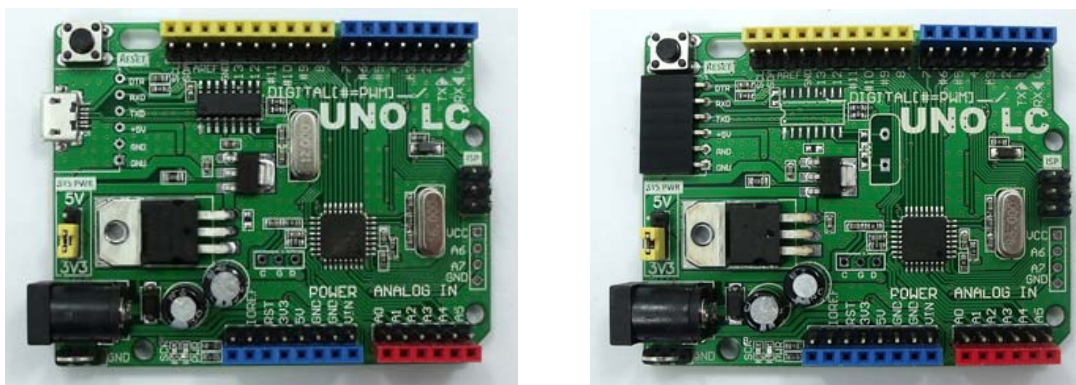
BUONO UNO R3: http://www.inhaos.com/product_info.php?products_id=66

BUONO UNO R3 LITE: http://www.inhaos.com/product_info.php?products_id=68

Based on the Arduino UNO R3, and the main difference is :

- MCU: ATmega328P TQFP-32
- Use C8051F321 to replace the ATmega16U2, We rewrite the USB to UART firmware and also use Arduino CDC driver.
- Use a 23V 2A DC2DC convertor to replace the 5V linear regulator, it can be load much bigger current loading , expand input range and reduce heat .
- Add LC Low pass filter for AVCC , to reduce analog nosie.
- 3.3V and 5V System power selectable
- Ground terminal for easy measurement

2.2 BUONO UNO LC , BUONO UNO LC LIT



BUONO UNO LC: http://www.inhaos.com/product_info.php?products_id=130

BUONO UNO LC LITE: http://www.inhaos.com/product_info.php?products_id=129

Based on the Arduino UNO R3, and the main difference is :

- MCU: ATmega328P TQFP-32
- Use CH340G to replace the ATmega16U2, it reduce about 1USD of cost.
- Use a LM7085 5V linear regulator
- 3.3V and 5V System power selectable
- Colorful connector
- Ground terminal for easy measurement



2.3 BUONO UNO CORE



BUONO UNO CORE: http://www.inhaos.com/product_info.php?products_id=143

Based on the Arduino UNO R3, and the main difference is :

- MCU: ATmega328P TQFP-32
- Onboard 3.3V regulator , system voltage 3.3V
- Vertical mounting design, saving PCB space, suitable for use in compact spaces application
- Can add LC-2000 / LC-3000 RF module , can remote uploading sketch if RF Module installed

2.4 Mega2560-CORE



Mega2560-CORE: http://www.inhaos.com/product_info.php?products_id=118

Based on the Arduino Mega2560, and the main difference is :

- MCU: ATmega2560
- Working with 3.3V to 5V
- All IO sinck to 2.54mm DIP connector
- Use USB2Serial Light or UC-2102 or UC-340G to upload sketch
- Compact size design, standard 2.54mm pin pitch, easy to install in any place



2.5 DUE-CORE

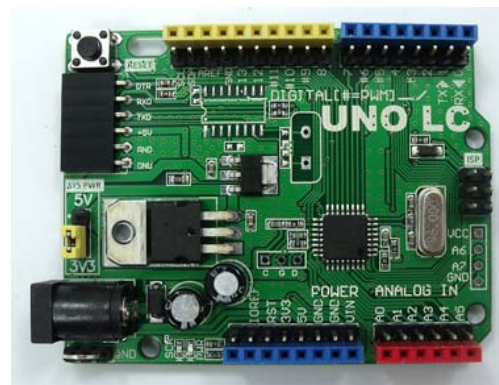
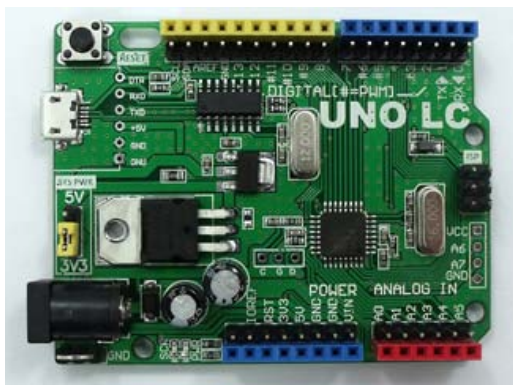


DUE-CORE: http://www.inhaos.com/product_info.php?products_id=164

Based on the Arduino DUE, and the main difference is :

- MCU: AT91SAM3X8E
- Working with 3.3V , Module supply voltage: 5V
- All IO sink to 2.54mm DIP connector
- Use USB2Serial Light or UC-2102 or UC-340G to upload sketch
- Compact size design, standard 2.54mm pin pitch, easy to install in any place

2.6 MassDuino UNO LC , MassDuino UNO LC LITE



MassDuino UNO LC: http://www.inhaos.com/product_info.php?products_id=156

MassDuino UNO LC LITE: http://www.inhaos.com/product_info.php?products_id=157

New MassDuino series, based on [MD-328D](#) MCU.

- MCU: MD-328D
- Use CH340G to replace the ATmega16U2, it reduce about 1USD of cost.
- Use a LM7085 5V linear regulator
- 3.3V and 5V System power selectable
- Colorful connector
- Ground terminal for easy measurement

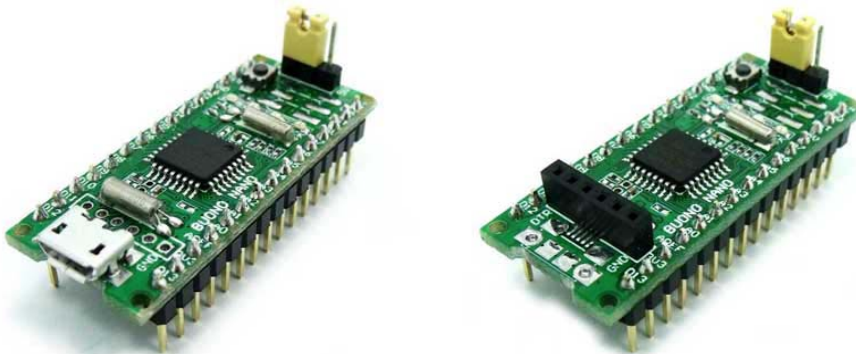


2.7 MassDuino UNO CORE



- Massduino UNO CORE: http://www.inhaos.com/product_info.php?products_id=158
- New MassDuino series, based on [MD-328D](#) MCU.
- MCU: A MD-328D
- Onboard 3.3V regulator , system voltage 3.3V
- Vertical mounting design, saving PCB space, suitable for use in compact spaces application
- Can add LC-2000 / LC-3000 RF module , can remote uploading sketch if RF Module installed

2.8 MassDuino Nano / Nano Lite



MassDuino Nano / Nano Lite: http://www.inhaos.com/product_info.php?products_id=161

- New MassDuino series, based on [MD-328D](#) MCU.
- MCU: A MD-328D
- Onboard 3.3V regulator , system voltage 3.3V
- Vertical mounting design, saving PCB space, suitable for use in compact spaces application
- Can add LC-2000 / LC-3000 RF module , can remote uploading sketch if RF Module installed



Product Map:

No.	BUONO UNO Series	MassDino Series	CORE Series
1	BUONO UNO R3: http://www.inhaos.com/product_info.php?products_id=66		BUONO UNO CORE: http://www.inhaos.com/product_info.php?products_id=143
2	BUONO UNO R3 LITE: http://www.inhaos.com/product_info.php?products_id=68		BUONO UNO CORE: http://www.inhaos.com/product_info.php?products_id=158
3	BUONO UNO LC: http://www.inhaos.com/product_info.php?products_id=130	MassDuino UNO LC: http://www.inhaos.com/product_info.php?products_id=156	Mega2560-CORE: http://www.inhaos.com/product_info.php?products_id=118
4	BUONO UNO LC LITE: http://www.inhaos.com/product_info.php?products_id=129	MassDuino UNO LC LITE: http://www.inhaos.com/product_info.php?products_id=157	
5		Massduino Nano / Nano Lite: http://www.inhaos.com/product_info.php?products_id=161	
6			DUE-CORE: http://www.inhaos.com/product_info.php?products_id=164



USB to UART Cable selection:

1, UC-2102: http://www.inhaos.com/product_info.php?products_id=120

2, UC-340G: http://www.inhaos.com/product_info.php?products_id=159

No.	Item	BUONO USB2Serial Light	UC-2102	UC-340G
1	USB Chip	C8051F321	CP2102	CH340G
2	UART Voltage Level	TTL-3.3V	TTL-3.3V	TTL-5V
3	Pinout	Same	Same	Same
4	5 times DTR toggled after power up (The will lead the Arduino MCU reset 5times , delay the power up speed)	NO (Good)	YES	YES
5	Driver	Arduino Native driver	Form Silabs	Form WCH
6	Cost	High	Mid	Low
7	Known issue	No	No	Can not used with Arduino IDE 1.6.8 , it will cause the MCU reset repeatedly