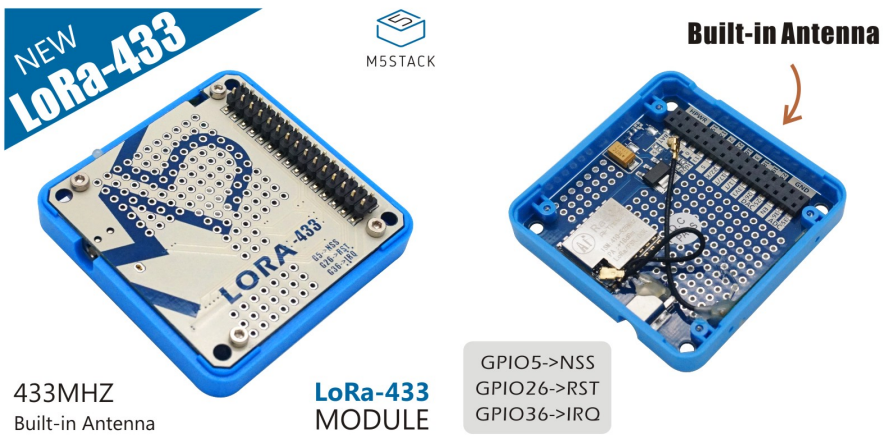
Module LoRa (433MHz)



Description

LoRa (433MHz) integrated LoRa (433MHz) Module Ra-02, designed and produced by Ai-Thinker. On the board has some extra space left over, so we give you a prototyping area, it's great for adding on your customized circuit working with the LoRa (433MHz) Module.

LoRa (433MHz) enables long-range transmissions (more than 10 km in rural areas) with low power consumption， The technology is presented in two parts: LoRa (433MHz), the physical layer and LoRaWAN (Long Range Wide Area Network), the upper layers.

LoRa (433MHz) and LoRaWAN permit long-range connectivity for Internet of Things (IoT) devices in different types of industries.

Product Features

- LoRa (433MHz) Module: Ra-02 (by Ai-Thinker)
- Series Communication Protocol: SPI
- Universal Perboard
- Working Frequency: 433 MHz
- Supports FSK, GFSK, MSK, GMSK, LoRa ™ and OOK modulation modes
- Receive sensitivity: lowest to -141 dBm
- Programmable bit rate up to 300Kbps
- Build-in PCB Antenna
- External Antenna port
- Program platform: Arduino, Micropython, UIFlow(Blockly)
- Product Size：54.2mm x 54.2mm x 12.8mm
- Product weight：14.5g

Include

- 1x M5Stack LoRa Module

Applications

- Automatic meter reading
- Home building automation
- Remote irrigation system

EasyLoader

EasyLoader is a simple and fast program burner. Every product page in EasyLoader provides a product-related case program. It can be burned to the master through simple steps, and a series of function verification can be performed.(**Currently EasyLoader is only available for Windows OS**)

2.After downloading the software, double-click to run the application, connect the M5 device to the computer via the data cable, select the port parameters, and click **"Burn"** to start burning.

3.The CP210X (USB driver) needs to be installed before the EasyLoader is burned.

Example

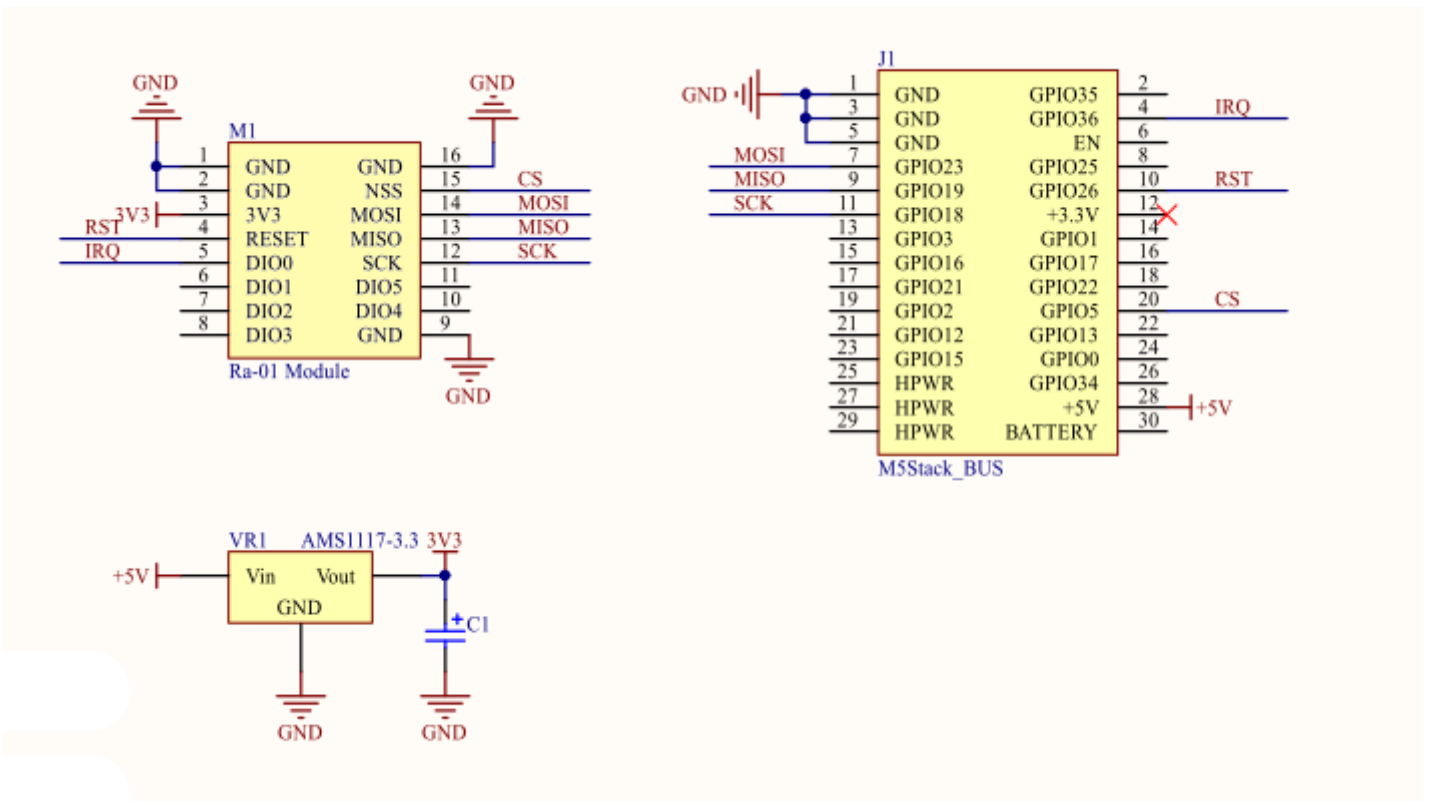
Arduino IDE

These are the point-to-point communication examples between two LORA modules. The LoRa nodes send and receive messages.

- Blue string indicates sending succeed.
- Yellow string display the received messages.
- Red string indicates initialization failed.

```
#include <M5Stack.h>
#include <M5LoRa.h>

//declaration
String outgoing;                    // outgoing message
byte msgCount = 0;                  // count of outgoing messages
byte localAddress = 0xBB;           // address of this device
byte destination = 0xFF;            // destination to send to

//initialization
M5.begin();
LoRa.setPins();                     // set CS, reset, IRQ pin
LoRa.begin(433E6);                  // initialize ratio at 915 MHz

//send message
void sendMessage(String outgoing) {
  LoRa.beginPacket();               // start packet
  LoRa.write(destination);          // add destination address
  LoRa.write(localAddress);         // add sender address
  LoRa.write(msgCount);             // add message ID
  LoRa.write(outgoing.length());    // add payload length
  LoRa.print(outgoing);             // add payload
  LoRa.endPacket();                 // finish packet and send it
  msgCount++;                       // increment message ID


//receive message
void onReceive(int packetSize) {
  if (packetSize == 0) return;      // if there's no packet, return
  int recipient = LoRa.read();      // recipient address
  byte sender = LoRa.read();        // sender address
  byte incomingMsgId = LoRa.read();  // incoming msg ID
  byte incomingLength = LoRa.read(); // incoming msg length

  String incoming = "";

  while (LoRa.available()) {
    incoming += (char)LoRa.read();
  }
}

onReceive(LoRa.parsePacket());
```

Schematic


GND
GND
M1
1
2
3
4
5
6
7
8
GND
GND
3V3
RESET
DIO0
DIO1
DIO2
DIO3
16
15
14
13
12
11
10
9
GND
NSS
MOSI
MISO
SCK
DIO5
DIO4
GND
CS
MOSI
MISO
SCK
3V3
RST
IRQ
Ra-01 Module
GND
J1
GND
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
GND
GND
GND
GPIO23
GPIO19
GPIO18
GPIO3
GPIO16
GPIO21
GPIO2
GPIO12
GPIO15
HPWR
HPWR
HPWR
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
GPIO35
GPIO36
EN
GPIO25
GPIO26
+3.3V
GPIO1
GPIO17
GPIO22
GPIO5
GPIO13
GPIO0
GPIO34
+5V
BATTERY
IRQ
RST
CS
+5V
MOSI
MISO
SCK
M5Stack_BUS
VR1
AMS1117-3.3
3V3
+5V
Vin
Vout
GND
C1
GND
GND