General description:

Near Field communication (NFC) is a popular technology in recent years. We often hear it mentioned when technology companies launch their latest products. More and more mobile phones and iot devices on the market are starting to support NFC.

Near field communication (NFC) is a set of standards for smartphones and similar devices to establish radio communication with each other by touching them together or bringing them into close proximity, usually no more than a few centimeters.

For electronics geeks, we also want to use NFC technology to make our own things. So we build this NFC RFID module. This module is built around DP1332E. DP1332E is very popular in NFC area. And the company offers much technology document to help developers. We developed this module based on the official document.

We almost breakout all the IO pins of DP1332E on this module. Users could easily connect and play. It is very easy to plug and play. However, if users want to use other interface such as UART or SPI, this module also makes it easy to connect those pins.

Features and benefits:

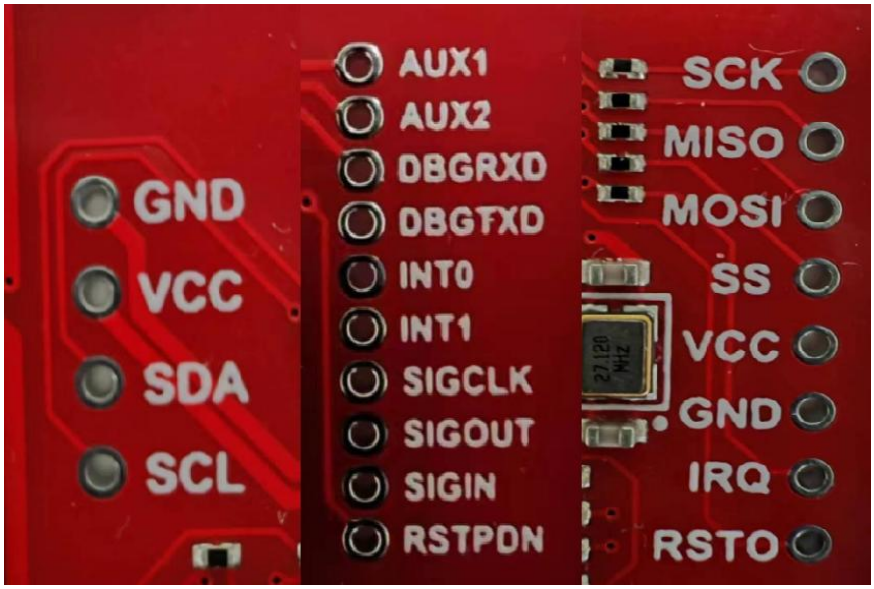
- Support I2C, SPI and HSU (High Speed UART);
- RFID reader/writer mode support
  - M1 card, Ultralight and DesFire cards
  - ISO/IEC 14443 cards such as CD97BX, CD light, DesFire, P5CN072 (SMX)
  - Innovision Jewel cards such as IRT5001 card

- FeliCa cards such as RCS_860 and RCS_854

- Plug and play, Arduino compatible
- Built in PCB Antenna, with 5cm~7cm communication distance
- On-board level shifter, Standard 5V TTL for I2C and UART, 3.3V TTL SPI
- Work as RFID reader/writer
- Work as 14443-A card or a virtual card
- Support NFC with Android phone
- Small size: 43mm*41mm*4mm
- Easy to change mode: with a small SMD toggle Switch, it becomes very easy to change among I2C, SPI and HSU modes ;

目录

1. Introduce

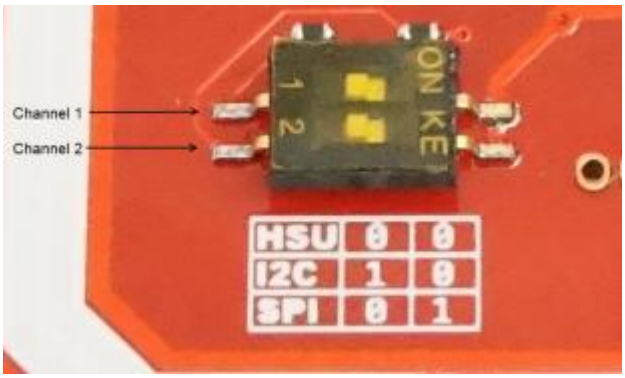


VCC: 3.3V~5V

I2C/UART: 3.3V~24V TTL

SPI: 3.3V TTL with 100 ohm resistors in series. It could be connected directly to 5V interface of microcontroller such as Arduino.

The I2C and HSU shares the same pins. The definition of IIC pins is printed at front and the HSU's is printed at the back. The HSU mode is configured as the default mode. But you could change the interface by setting the toggle switch.



The switch setting is shown as follows:

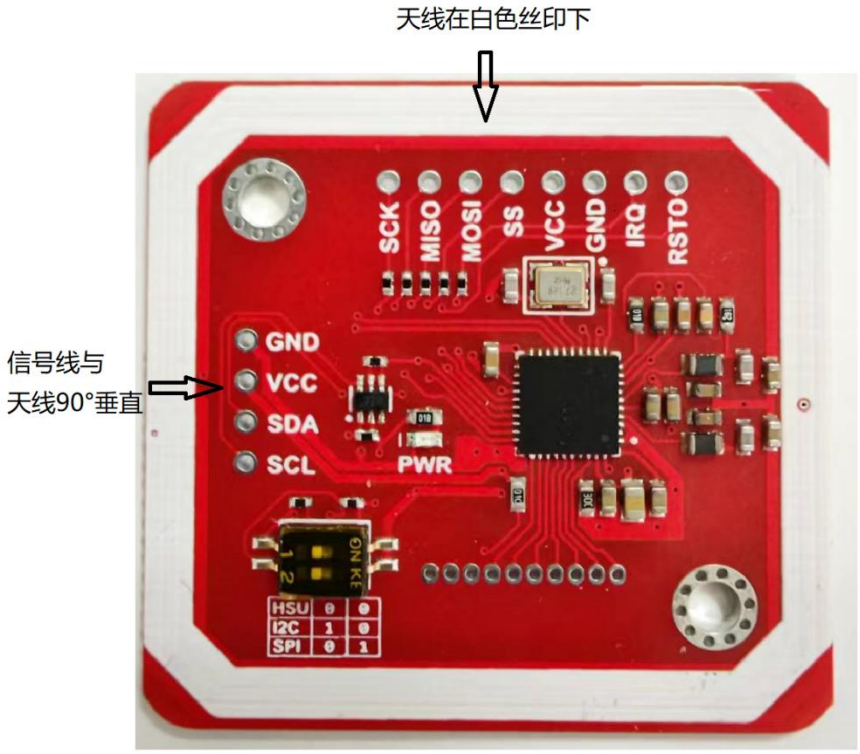
Working Interface	Channel 1	Channel 2
HSU	OFF	OFF
I2C	ON	OFF
SPI	OFF	ON

2. Hardware Installation

2.1 Solder the connector

The bended male pins come with the NFC board.

Some users might need soldering other types of connectors or directly solder wires on it. Make sure the wires go across the antenna lines in 90 degree.



2.2 Connect with Arduino

If without the sensor shield, please connect as following:

Mode	TC13QM2	Arduino UNO	Arduino Leonardo	Arduino Mega (2560)	Arduino Due
Power	VCC	5V	5V	5V	5V
	GND	GND	GND	GND	GND
IIC/I2C Mode	SDA	A4/SDA	Pin 2 /SDA	Pin 20 /SDA	Pin 20 /SDA
	SCL	A5/SCL	Pin 3/SCL	Pin 21/SCL	Pin 21/SCL
HSU Mode	TXD	Pin 0	Pin 0	Pin 19	Pin 19
	RXD	Pin 1	Pin 1	Pin 18	Pin 18
SPI Mode	SCK	Pin 13 or ICSP-3	ICSP-3	Pin 52 or ICSP-3	ICSP-3
	MISO	*Pin 12 or ICSP-1*	*ICSP-1*	*Pin 50 or ICSP-1*	*ICSP-1*
	MOSI	*Pin 11 or ICSP-4*	*ICSP-4*	*Pin 51 or ICSP-4*	*ICSP-4*
	SS	*Pin 10*	*Pin 10*	*Pin 10*	*Pin 10*

Could not present message in Serial Monitor on PC

Note: SPI on Due is still in developing

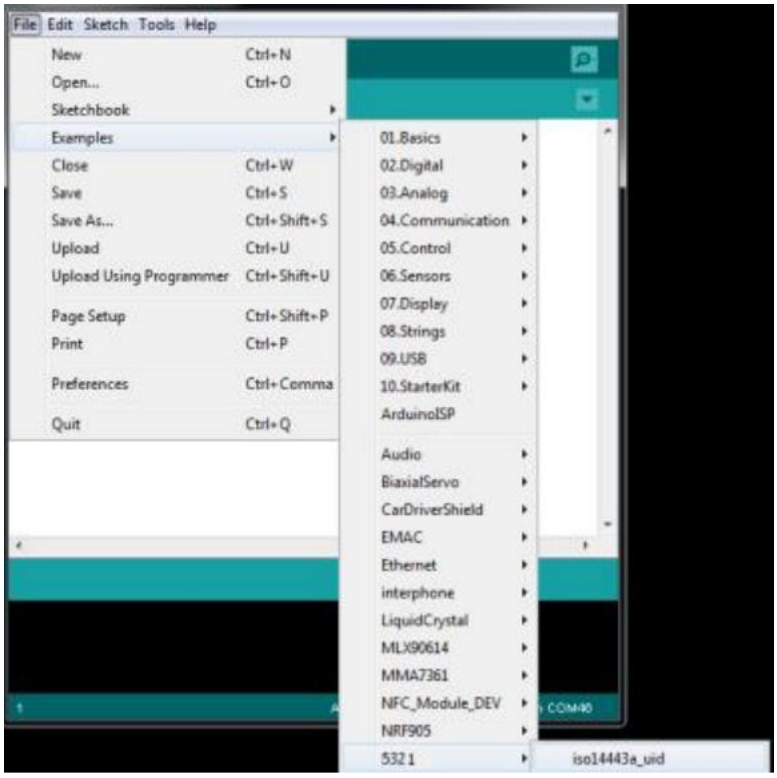
Arduino UNO only has one serial interface which is also connected to USB port to PC. In HSU mode, the serial monitor could not be used as message displaying windows.

3. Function Test

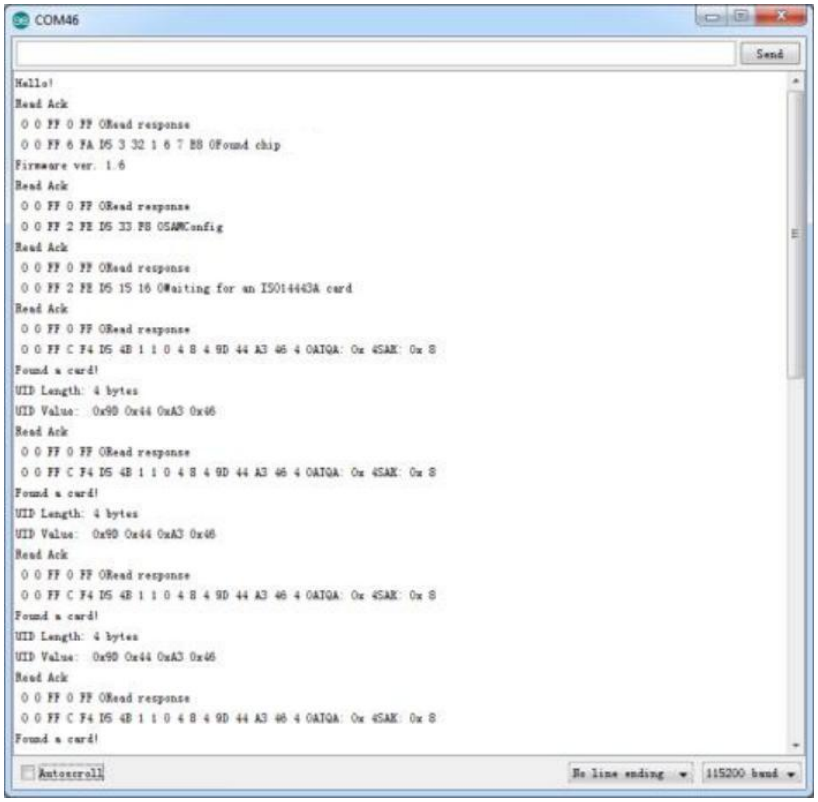
3.1 RFID Reader/Writer

Here we show how to read and write RFID card with this module.

Start Arduino IDE and choose the example



Upload the code to Arduino and open Serial monitor. Put a card on it:



You could also try other reading/writing example code in the library.

It also supports reading flexible tag. We tested flexible tags of Mifare 1 S50 and Ultralight. The reading distance is up to 5cm.

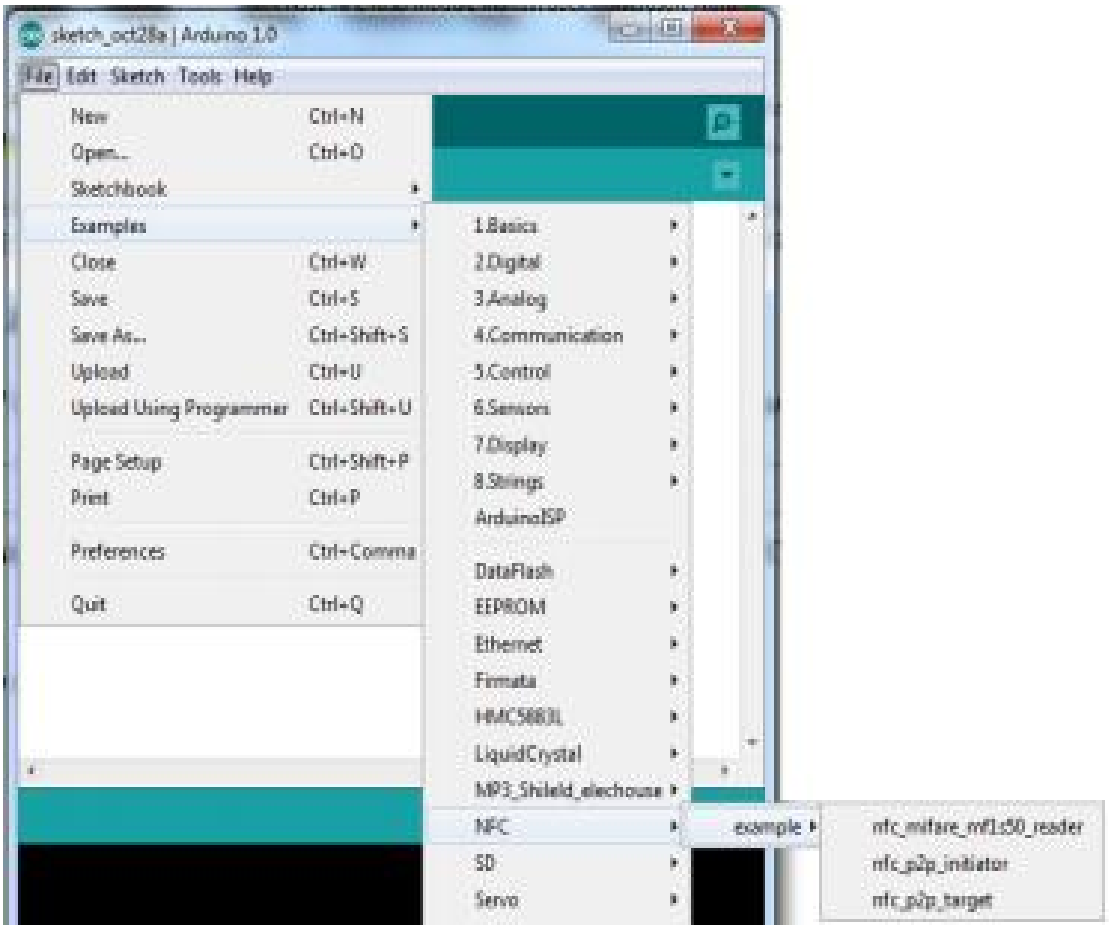
3.2 P2P NFC

Currently we are still developing the software. The P2P NFC communication between two TC13QM2 modules is only supported by I2C mode.

Here we need two Arduino boards to test this function. Basically we will program one NFC module as Initiator, and the other as Target.

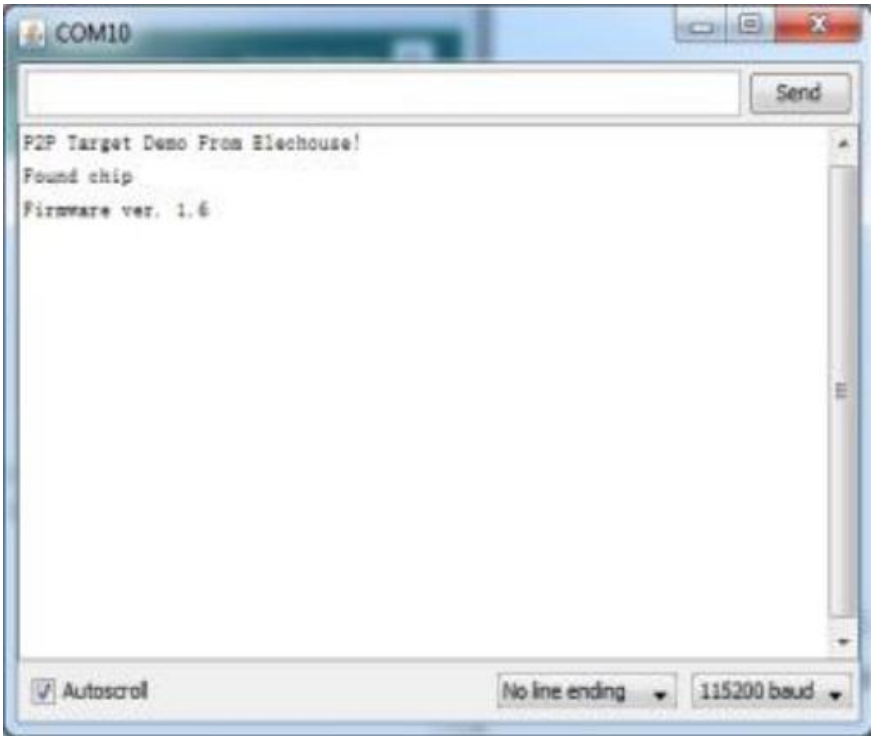
Please upload the following two examples to the two Arduino board:

- NFC_p2p_initiator
- NFC_p2p_target

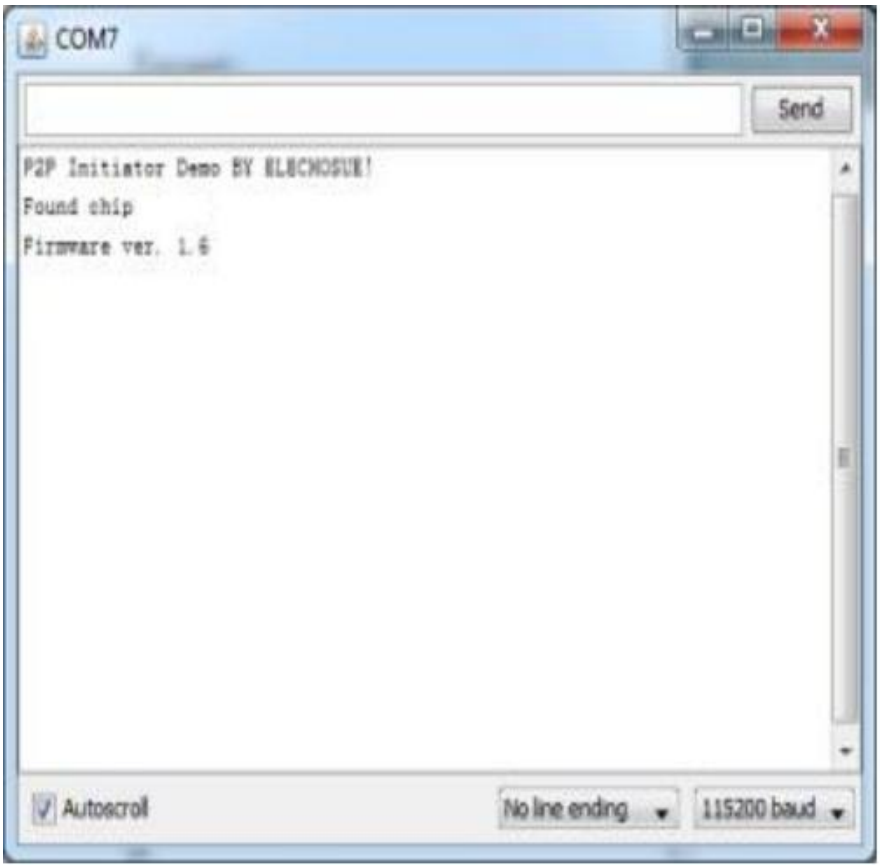


After uploading the sketches, open the Serial Monitor. Please note that Arduino IDE doesn'tsupport opening 2 Serial Monitors. So
you need another Serial Tool. Here we have 2 versions of Arduino IDE installed in my PC: Arduino 0022 andArduino 1.0. We open the two and could have two Serial Monitor working. Note the baud rate is 115200.

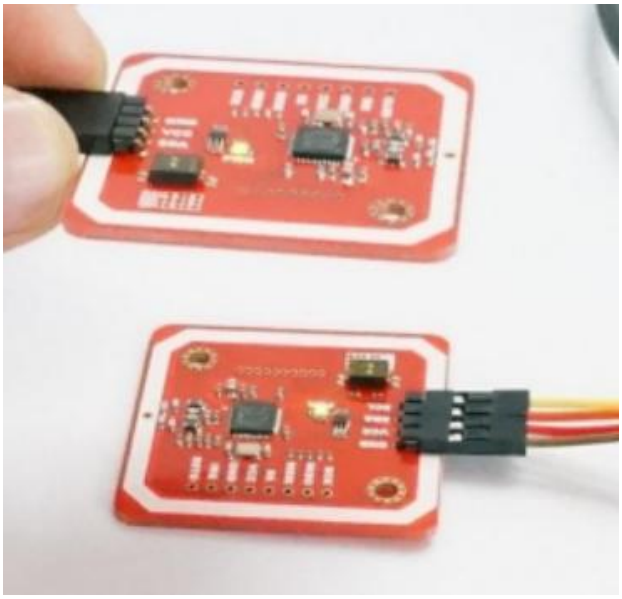
Target:



Initiator:

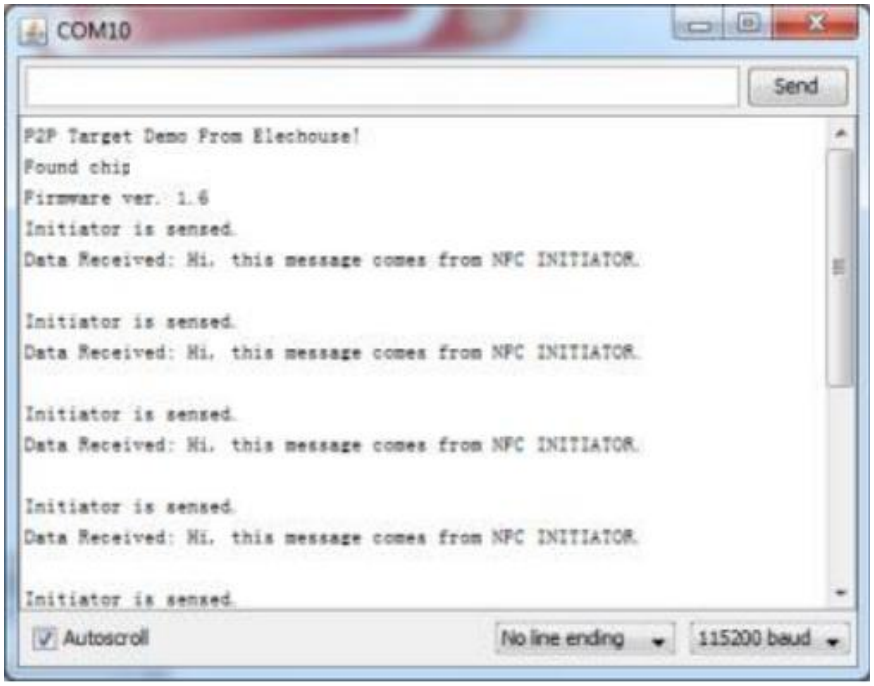


Then put one module above the other:

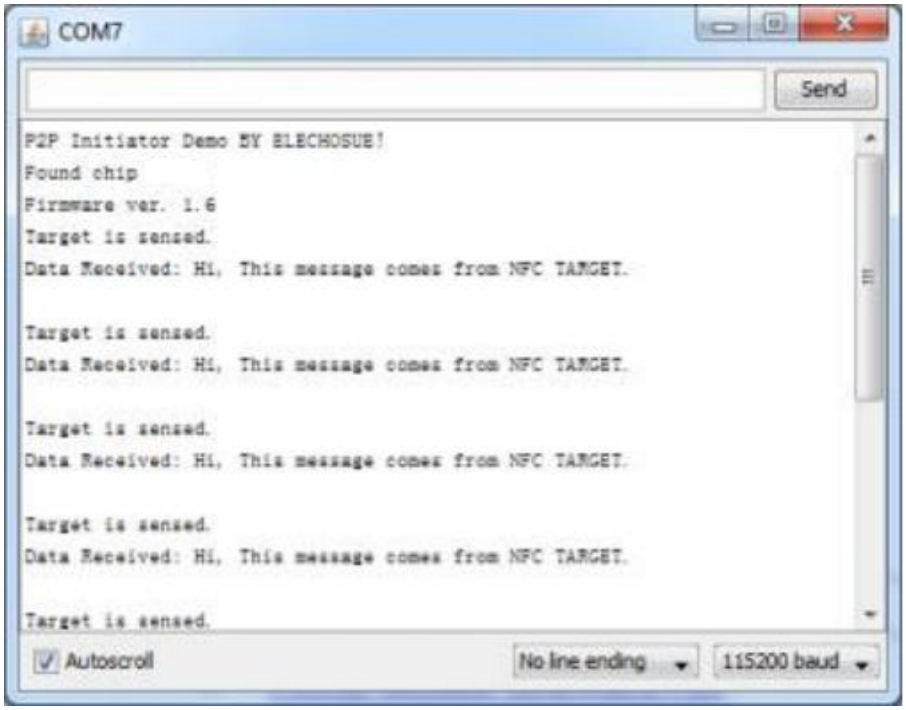


Finally we get：

Target:



Initiator:

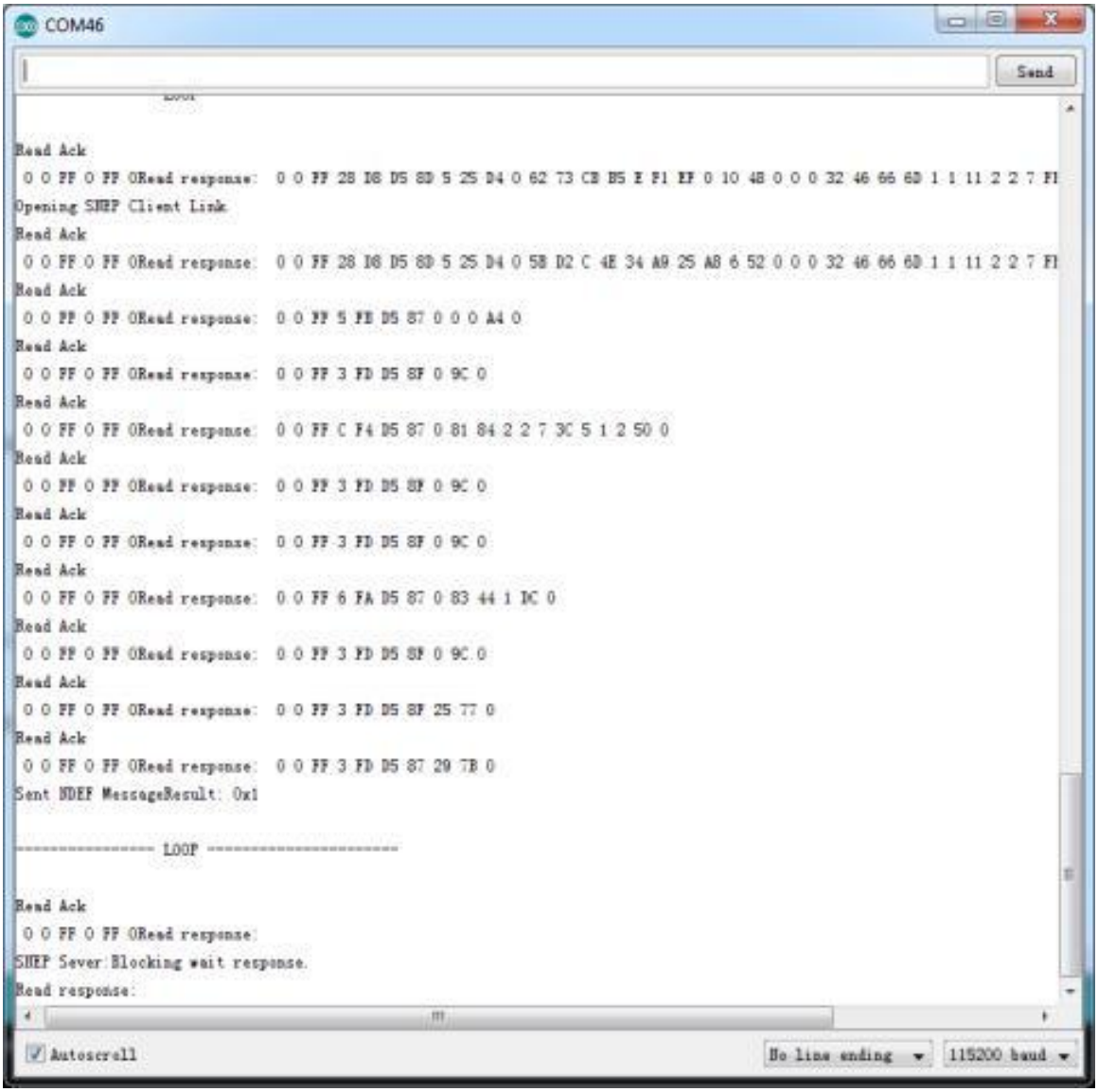


3.3 NFC with Android phone

Upload the code to Arduino, and open Serial Monitor:
Put a NFC-support phone on the module:

On Android phones, if you set the default browser, it will launch the browser and access the preset website

On Serial Monitor you could get the following result:


COM46
Send
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF 28 D6 D5 8D 5 25 D4 0 62 73 CB B5 E F1 EF 0 10 48 0 0 0 32 46 66 6D 1 1 11 2 2 7 F1
Opening SNEP Client Link
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF 28 D6 D5 8D 5 25 D4 0 5B D2 C 4E 34 A9 25 A8 6 52 0 0 0 32 46 66 6D 1 1 11 2 2 7 F1
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF 5 FE D5 87 0 0 0 A4 0
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF 3 FD D5 8F 0 9C 0
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF C F4 D5 87 0 81 84 2 2 7 3C 5 1 2 50 0
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF 3 FD D5 8F 0 9C 0
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF 3 FD D5 8F 0 9C 0
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF 6 FA D5 87 0 83 44 1 DC 0
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF 3 FD D5 8F 0 9C 0
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF 3 FD D5 8F 25 77 0
Read Ack
0 0 FF 0 FF 0Read response: 0 0 FF 3 FD D5 87 29 7B 0
Sent NDEF MessageResult: 0x1
---------- LOOP ----------
Read Ack
0 0 FF 0 FF 0Read response:
SNEP Sever Blocking wait response.
Read response:
Autoscroll
No line ending
115200 baud

4. Contact us

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