WHAT IS CLAIMED IS:

~~1. A RFID card learning apparatus, reading a RFID card, and simulating the~~ RFID card and transmit the RFID card's serial number and data, the RFID card learning apparatus comprising:

a microcontroller; and

a coil, coupled to the microcontroller, and sensing an electromagnetic signal to form an electromagnetic load or antenna, wherein the RFID card learning apparatus does not contain a RFID card chip nor RFID reader chip.

2. The RFID card learning apparatus as claimed in claim 1, wherein the RFID card learning apparatus further reads a RFID key fob, a RFID tag or RFID accessible device card, simulates the RFID key fob, the RFID tag or the RFID accessible device card, and transmits the serial number and the data from the RFID key fob, the RFID tag or the RFID accessible device card.

3. The RFID card learning apparatus as claimed in claim 1, wherein the RFID card learning apparatus further reads a proximity card, a vicinity card or NFC card, simulates the proximity card, the vicinity card or the NFC card, and transmits the serial number and the data from the proximity card, the vicinity card or the NFC card, wherein the proximity card, the vicinity card or the NFC card is used under a communication carrier frequency above 150kHz and below 40MHz.

4. The RFID card learning apparatus as claimed in claim 1, wherein the RFID card learning apparatus is made as a wearable product or a watch.

5. A RFID card learning apparatus, simulating a RFID card and transmit ~~RFID card serial number and data, the RFID card learning apparatus comprising:~~

~~a microcontroller; and~~

a coil, coupled to the microcontroller, and sensing an electromagnetic signal to form an electromagnetic load or antenna, wherein the RFID card learning apparatus does not contain a RFID card chip.

6. A RFID card learning apparatus, reading or simulating an ID number and data of a low frequency RFID card and mutually exchange the ID number and the data with a high frequency RFID card, the RFID card learning apparatus comprising:

an IC chip ; and

a coil, coupled to the IC chip, and sensing an electromagnetic signal to form an electromagnetic load or antenna.

7. The RFID card learning apparatus as claimed in claim 6, wherein when the RFID card learning apparatus approaches a low frequency RFID reading device or a high frequency RFID read-write device, the RFID card learning apparatus automatically performs determination according to a received carrier frequency, and transmits the low frequency RFID card's ID number and the data when approaching the low frequency RFID reading device, and mutually exchanges the high frequency RFID card's ID number and the data with the high frequency RFID read-write device when approaching the high frequency RFID read-write device.

8. The RFID card learning apparatus as claimed in claim 7, wherein when the RFID card learning apparatus approaches a RFID card reading device, the RFID card learning apparatus automatically performs determining according to a received carrier frequency, and switches different ID number and data for transmitting to the low ~~frequency RFID reading device at regular time intervals in case of the low frequency~~

~~RFID reading device, and mutually exchanges different ID number and data with the~~ high frequency RFID read-write device at regular time intervals in case of the high frequency RFID read-write device.

9. A RFID card learning apparatus, comprising:

a microcontroller; and

a coil, coupled to the microcontroller, and sensing an electromagnetic signal to form an electromagnetic load or antenna, wherein

when the RFID card learning apparatus approaches a low frequency reading device or a high frequency read-write device of an external device, the microcontroller is waken up due to a level variation of a carrier signal received from the low frequency reading device or the high frequency read-write device

10. A RFID card learning apparatus, comprising:

a microcontroller; and

a coil, coupled to the microcontroller, and receiving a first signal, wherein the first signal comprises a RFID card number;

wherein the microcontroller receives the first signal through the coil, and stores the RFID card number,

when the microcontroller receives a read request, the microcontroller transmits the RFID card number through the coil.

11. An operating method of a RFID card learning apparatus, comprising:

configuring a microcontroller and a coil, wherein the microcontroller receives a first signal through the coil, the first signal comprises a RFID card number, ~~and the microcontroller stores the RFID card number; and~~

transmitting the RFID card number through the coil by the microcontroller when the microcontroller receives a read request.

12. A RFID card learning apparatus, reading or simulating a low frequency RFID card and transmit an ID number and data, and reading or simulating a high frequency RFID card and mutually exchange the ID number and the data with a high frequency RFID read-write device, the RFID card learning apparatus comprising:

a microcontroller; and

a coil, coupled to the microcontroller, and sensing an electromagnetic signal to form an electromagnetic load or antenna.

13. The RFID card learning apparatus as claimed in claim 12, wherein the microcontroller is an 8-bits microcontroller or a 4-bits microcontroller.

14. A RFID card learning apparatus, adapted to simulate a low frequency RFID card and transmit an ID number and data, and adapted to simulate a high frequency RFID card and mutually exchange the ID number and the data with a high frequency RFID read-write device, the RFID card learning apparatus being packaged in a single chip, wherein the single chip comprises a microcontroller and an induction element, and the induction element is one of a coil, an antenna or a circuit trace on a circuit board.

WHAT IS CLAIMED IS:

1. A RFID card learning apparatus, adaptive to simulating a card reader for reading at a serial number and data of at least one of a plurality of RFID cards, and simulating the at least one of the plurality of RFID cards to transmit the corresponding serial number and data of the simulated one of the plurality of RFID cards, the RFID card learning apparatus comprising:

a microcontroller, comprising at least one I/O port and one ADC input port; and

a coil, having one end connected to the I/O port of the microcontroller and another end connected to the ADC input port, the coil sensing an electromagnetic signal and forming an electromagnetic load or antenna,

when the RFID card learning apparatus operates in a learning mode for simulating the card reader to read one of the plurality of RFID cards,

the microcontroller outputs a voltage signal with a frequency through the I/O port to the coil for charging the one of the plurality of RFID cards for simulation,

the microcontroller receiving a sensing electromagnetic signal in response to the voltage signal from the coil through the ADC input port, detecting a current variation or a voltage variation of the sensed electromagnetic signal to determine a load variation, using the load variation to obtain a digital signal as the ID number and data corresponding to the one of the plurality of RFID cards card, and storing the ID number and data corresponding to the one of the plurality of RFID cards as one of the plurality of different ID numbers and data,

when the RFID card learning apparatus operates in a normal mode for

simulating the at least one of the plurality of RFID cards,

the microcontroller being triggered to simulate one of the plurality of RFID cards by sequentially transmitting the plurality of ID numbers and data corresponding to the plurality of RFID cards.

2. The RFID card learning apparatus as claimed in claim 1, wherein the RFID card learning apparatus further reads a RFID key fob, a RFID tag or RFID accessible device card, simulates the RFID key fob, the RFID tag or the RFID accessible device card, and transmits the serial number and the data from the RFID key fob, the RFID tag or the RFID accessible device card.

3. The RFID card learning apparatus as claimed in claim 1, wherein the RFID card learning apparatus further reads a proximity card, a vicinity card or NFC card, simulates the proximity card, the vicinity card or the NFC card, and transmits the serial number and the data from the proximity card, the vicinity card or the NFC card, wherein the proximity card, the vicinity card or the NFC card is used under a communication carrier frequency above 150kHz and below 40MHz.

4. The RFID card learning apparatus as claimed in claim 1, wherein the RFID card learning apparatus is made as a wearable product or a watch.

5. The RFID card learning apparatus as claimed in claim 1, wherein

the microcontroller further comprising another I/O port, a PWM Output Port, the microcontroller outputting a pulse-width-modulation (PWM) signal through the PWM Output Port, the PWM Output Port being connected to the one end of the coil which is connected to the I/O port of the microcontroller, wherein

when the RFID card learning apparatus operates in the learning mode, the I/O port of the microcontroller is set to be floating, the another I/O port of the microcontroller is set to be a high potential, and the PWM signal is transmitted to the coil for reading the one of the plurality of RFID cards.

6. The RFID card learning apparatus as claimed in claim 1, further comprising an input stage circuit, wherein

the microcontroller further comprises a positive OP input port, a negative OP input port, an OP output port and an operation amplifier, inputs of the positive OP input port and the negative OP input port are used as two inputs of the operation amplifier, and output of the operation amplifier is coupled to the OP output port, wherein

an input terminal of the input stage circuit being connected to the another end of the coil, the ADC input port,

a first output terminal of the input stage circuit being connected to the positive OP input port of the microcontroller, and

a second output terminal of the input stage circuit being connected to the negative OP input port of the microcontroller, wherein

the input stage circuit being capable of adjusting a frequency of the electromagnetic signals sensed by the coil by using a capacitor coupling to the coil, and the input stage circuit being capable of low-pass filtering before the electromagnetic signals sensed by the coil being transmitted to the positive OP input port of the microcontroller or to the negative OP input port of the microcontroller.

7. A wearable product, integrated with a microcontroller and a coil, wherein the microcontroller comprising a first I/O port, a second I/O port and a ADC input port; and

a coil having one end connected to the first I/O port of the microcontroller and another end connected to the second I/O port and the ADC input port, the coil forming as an electromagnetic load or antenna,

wherein the microcontroller outputs a voltage signal with a frequency through the first I/O port to the coil for charging the one of the plurality of RFID cards for simulation,

the microcontroller receives a first signal through the coil without demodulation, wherein the first signal comprises a RFID card number and data,

the microcontroller stores the RFID card number and data by detecting a current variation or a voltage variation of the undemodulated first signal to determine a load variation, using the load variation to obtain the RFID card number,

when the microcontroller receives a read request, the microcontroller transmits the RFID card number through the coil.

8. An operating method of a wearable product, comprising:

configuring a microcontroller and a coil, wherein the microcontroller outputs a voltage signal with a frequency to the coil for charging the one of the plurality of RFID cards for simulation, receives a first signal in response to the voltage signal through the coil, the first signal comprises a RFID card number, and detects a current variation or a voltage variation of the first signal to determine a load variation, using the load variation to obtain the RFID card number, and stores the RFID card number; and

transmitting the RFID card number through the coil by the microcontroller when the microcontroller receives a read request.