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# MODBUS ID READER YW-635MK

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User Manual V1.0



**YOWO RFID Technology Co., Ltd.**

***YOWO RFID***

**Version:**

Version	History	Date
V1.0	Initial	2020.3

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# 1. Summary

**YW-635MK RFID** card reader is a universal reader designed by 125K contactless RF technology. The reader is embedded with Cortex-M3 processor to ensure stable and reliable performance. The interface protocol of reader used common Modbus-RTU Protocol. It can be easily connected with the industrial devices. In order to facilitate the user's secondary development, we provide the Computer-side testing and setting software, PLC-side testing routines. The reader can automatically search for specified types of cards. And the users only need to read the card serial number register to get it easily. The reader register address is compatible with **YW-630MA** and **YW-631MA**.

## 2. Specification

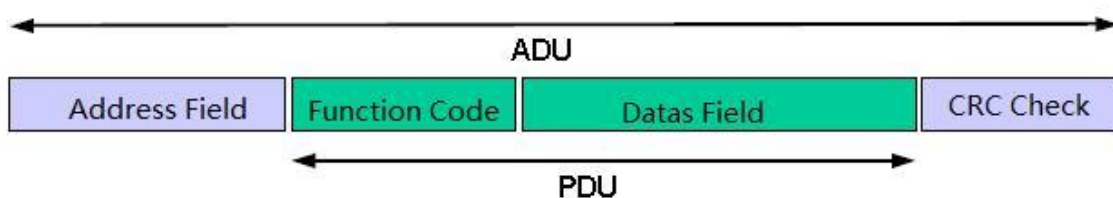
- ◆ Frequency : 125K
- ◆ MCU: Cortex M3 STM32F103
- ◆ Card Protocol : 125K
- ◆ Read distance : about 10cm
- ◆ Beep and LED : One beep and one Green LED, they can be controlled by users.
- ◆ Interface : RS-485, Modbus-RTU Protocol
- ◆ Power : DC9 ~ 24V
- ◆ Power dissipation : about 0.5W
- ◆ Working Temp : -20 ~ + 70°C
- ◆ Storage Temp : -40 ~ + 125°C
- ◆ Size : 115 \* 75 \* 15 (mm)
- ◆ Weight : about 150g
- ◆ Remote update : Supported

## 3. Wiring

Color	Symbol
RED	POWER VCC (+ 9 ~ + 24V)
BLACK	POWER GND
YELLOW	485 D+ (A)
GREEN	485 D- (B)

## 4. Modbus-RTU

The MODBUS protocol defines a simple protocol data unit (PDU), which is independent of the underlying communication layer. MODBUS protocol mapping on a particular bus or network can introduce some additional fields on the application data unit (ADU). General Modbus frame as shown below.



(Figure 1 Modbus Protocol package)

### 4.1 Modbus-RTU Protocol

The YW-635MK RFID reader supports many bauds, the default baud rate is *19200, N, 8,1*.

#### 4.1.1 PLC Send:

Device ID	Function	Data	CRC16
1 Byte	1 Byte	N Bytes	2 Bytes (LSB)

### 4.1.2 Reader Response:

Device ID	Function	Data	CRC16
1 Byte	1 Byte	N Bytes	2 Bytes (LSB)

## 4.2 Supported command for the Reader

The following command are displayed in HEX format.

### 4.2.1 Read Multi-Registers Command -0x03

#### PLC Send:

Device ID	FUN	Data				CRC16
		Started Register address High Byte	Started Register address Low Byte	Register Number High Byte	Register Number Low Byte	
1 Byte	0x03	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes (LSB)

#### Reader Response:

Device ID	FUN	Data		CRC16
		Byte Numbers of reading	Data of reading	
1 Byte	0x03	1 Byte	N Bytes	2 Bytes (LSB)

## 4.2.2 Read Single-Register Command-0x06

### PLC Send:

Device ID	FUN	Data				CRC16
		Register address High Byte	Register address Low Byte	Data High Byte	Data Low Byte	
1 Byte	0x06	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes (LSB)

### Reader Response:

Device ID	FUN	Data				CRC16
		Register address High Byte	Register address Low Byte	Data High Byte	Data Low Byte	
1 Byte	0x06	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes (LSB)

## 4.2.3 Write Multi-Registers Command-0x10

### PLC Send:

Device ID	FUN	Data						CRC16
		Started Register address High Byte	Started Register address Low Byte	Register Number High Byte	Register Number Low Byte	Data Len	Data	
1 Byte	0x10	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	N Bytes	2 Bytes (LSB)

### Reader Response:

Device ID	FUN	Data				CRC16
		Started Register address High Byte	Started Register address Low Byte	Register Number High Byte	Register Number Low Byte	
1 Byte	0x10	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes (LSB)



## 5. Register definition

### **Data Format:**

**0xAAAA, Hex Data AAAA**

**AAAAH, Hex Data AAAA**

**11000B, Binary Data 11000**

**Register Address is Dec Number**

### **Note:**

For **Siemens PLC**, we need add 1 for all registers address in PLC programming. If the register address is 40001 in reader, then it needs to be written as 40002 in PLC programming. Other PLC are based on the actual address in the manual (no need to add 1 for register's address).

Register Address Table :

NO	Register address	Details
<b>Saved Register in Power Off state</b>		
1-1	Reserved Register: 40000	
1-2	Parameter Register 1: 40001	Baud and Device ID
1-3	Parameter Register 2: 40002	
1-4	Parameter Register 3: 40100	
1-5	Reserved Register: 40101~40105	
1-6	Delay Time Register For Same Card: 40106	
<b>Not Saved Register in Power Off state</b>		
2-1	IO Control Register: 40003	
2-2	Card Serial Number Register: 40004~40007	
2-3	Reserved Register: 40008~40099	

## 5.1 Saved Register in power off state

All Power-Off Saved Registers will save the data after power off, so these registers only need be written once. You can write these config data by PC Demo and Config software.

### 5.1.1 Parameter Register 1: 40001

Parameter Register 1 is used to configure the device ID of the reader and the communication baud rate.

**Address 40001 (Default: 0x0301)**

Bit	Description
15~8	<b>Available baud:</b> 0x01->9600bps 0x02->14400bps 0x03->19200bps( <b>Default</b> ) 0x04->28800bps 0x05->38400bps 0x06->57600bps 0x07->115200bps <b>Others-&gt;19200bps</b>
7~0	<b>Device ID: (Default: 0x01)</b> ID Range (0x01~0xFE)

### 5.1.2 Parameter Register 2: 40002

**Address 40002 (Default: 0x0035)**

Bit	Description
15~6	Reserved
5	<b>Green LED action after getting card serial number.</b> 0->NO Action 1-> Green LED Turn ON for one time ( <b>Default</b> )
4	<b>Beep action after getting card serial number.</b> 0->NO Action 1->Beep Turn ON for one time ( <b>Default</b> )
3~0	<b>Card Type:</b> 0x05 -> 125K ID Card ( <b>Default</b> )

### 5.1.3 Parameter Register 3: 40100

Address 40100 (Default: 0x0010)

Bit	Description
11~15	Reserved
10~9	<b>Card serial number registers filling mode: Bit10~bit9 (Binary)</b> 00-> HEX filled mode (Default) eg: 00 1F 72 03 Card cover: no 01-> DEC filled mode for BCD eg: 00 02 06 08 03 Card cover: 0002060803 11-> weigand26 filled mode eg: 03 12 91 87 Card cover: 031,29187
8	<b>Is display ID Card factory byte?</b> <b>Factory Info(1 Byte), Card serial number (4Bytes).</b> 0-> Card serial number registers are filled only by card serial number bytes. (Default) 1-> Card serial number registers are filled by <b>factory info byte (1 byte) and card serial number (4Bytes).</b> <b>Note: The bit setting is valid when bit10~9 are set for 00(Hex filled mode).</b>

7	<p><b>Are Card Serial Number Registers cleared automatically?</b></p> <p>0-&gt; NO. Card Serial Number Registers are needed to clear by users (<b>Default</b>)</p> <p>But If the card serial number registers are not cleared, when the next ID card entered into the antenna area, the new card serial numbers are wrote into the card serial number registers.</p> <p>1-&gt; YES.</p> <p>Auto clear card number register condition:</p> <p>I: Firstly, PLC has read all card number registers (40004~40007).</p> <p>II: Secondly, when PLC reread the card serial number registers for second time, the card serial number registers are cleared.</p>
5~6	Reserved
4	<p><b>Card serial Register Display mode</b></p> <p>0-&gt; LSB Mode。</p> <p>1-&gt; MSB Mode。 (<b>Default</b>)</p>
0~3	Reserved

#### 5.1.4 Delay Time Register For Same Card: 40106

After the first card swiping, if the card read last time is found within the time set in the register, it is considered that no card is entered. If this time is exceeded, you can operate as a new read label again. This function is mainly used to prevent users from operating carelessly and Misreading many times. After the ID card is read, users must take away the card from antenna area, then the card can be reread.

**Default : 0x0014 ( 2 second)**

**unit: 100ms**

## 5.2 Not saved register in power off state

Not saved registers in power off state will be initialized for the default values after power on.

### 5.2.1 IO Control Register: 40003

The register is mainly used for controlling Beep and Green LED. After all IO operations are finished, the register value is cleared automatically.

**Address 40003: (Default: 0x0000)**

Bit	Description
15~10	Repeat times
9~8	IO device select: 0x01->Green LED 0x02->BEEP 0x03->Green LED and BEEP
7~4	The time for Beep or LED turning on Unit:100ms
3~0	The time for Beep or LED turning off Unit:100ms

#### Example:

1. The Green LED Twinkle 3 times, turn on for 500ms and Turn off for 500ms, then the register can be set for 0x0D55.
2. The BEEP ring 1 times, turn on 500ms and turn off for 0ms, then the register can be set for 0x0650.

## 5.2.2 Card Serial Number Register: 40004~40007

If LSB is selected in parameter register 3, then the register filled as:

Address	Bit:15~8(High Byte)	Bit:7~0(Low Byte)
40004	SN1	SN0
40005	SN3	SN2
40006	SN5	SN4
40007	SN7	SN6

If MSB is selected in parameter register 3, then the register filled as:

Address	Bit:15~8(High Byte)	Bit:7~0(Low Byte)
40004	SN0	SN1
40005	SN2	SN3
40006	SN4	SN5
40007	SN6	SN7

## 6. PLC Programming flow

YW-635MK reader fully complies with MODBUS-RTU protocol operation specification. The power-off saving registers can be permanently saved only once configured. It is not recommended that power-off saving registers be written frequently.

### 1. Configure the parameter registers

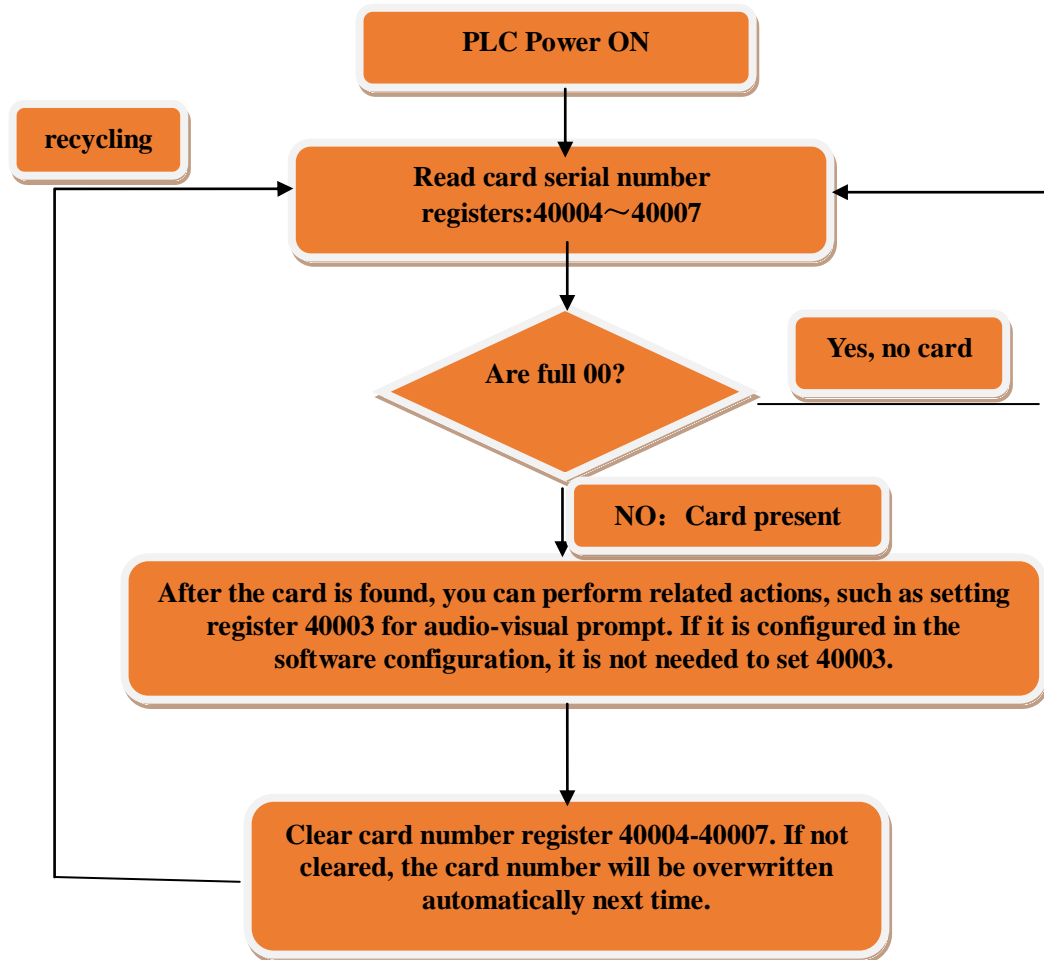
The configurations can be configured either by computer software or by PLC programming. It only needs to be written once and can be saved after power off. It is recommended to configure through computer software. The following parameters can be configured.

- I. **Register 40001**. Write the system baud and the slave address. If 0x0301 is written, the baud rate is 19200 and the slave address is 1. Note that if the baud rate changes, it needs to be configured from the new link software.
- II. **Register 40002**. If 0x0035 is written, the buzzer will ring once and the green LED will light once after the card is found. If 0x0005 is written, the GREEN and Beep needs to be controlled by IO control register.  
**Note:** the minimum 4 bits must be configured as 5 (ID card type), otherwise the card cannot be read.
- III. **Register 40100**. If 0x0010 is written, the 4-byte hex card number will be displayed, the factory's information will not be displayed, the card number will not be automatically cleared.



IV. **Register 40106.** If 0x0014 is written, the time delay of the same card is 2 seconds, so as to prevent wrong swiping, it can also be configured for a longer time.

## 1. PLC Program



(125K ID Flow chat)

## 7. How to order

Need to order or ask for code examples, please contact us through our website or by phone.

***YOWO RFID Technology Co.,Ltd***

**Web:** <http://www.yoworfid.com> <http://www.youwokeji.com.cn>

**Tel:** +86-10-59395668

**Phone:** +86-13671114914, +86-13691531038, +86-18910685939

**Email:** Coodor@126.com