DW-SK24-LY-S lock control board

User manual

Version number 2.1

SUZHOU DEWO SMART SYSTEM CO., LTD

Preface

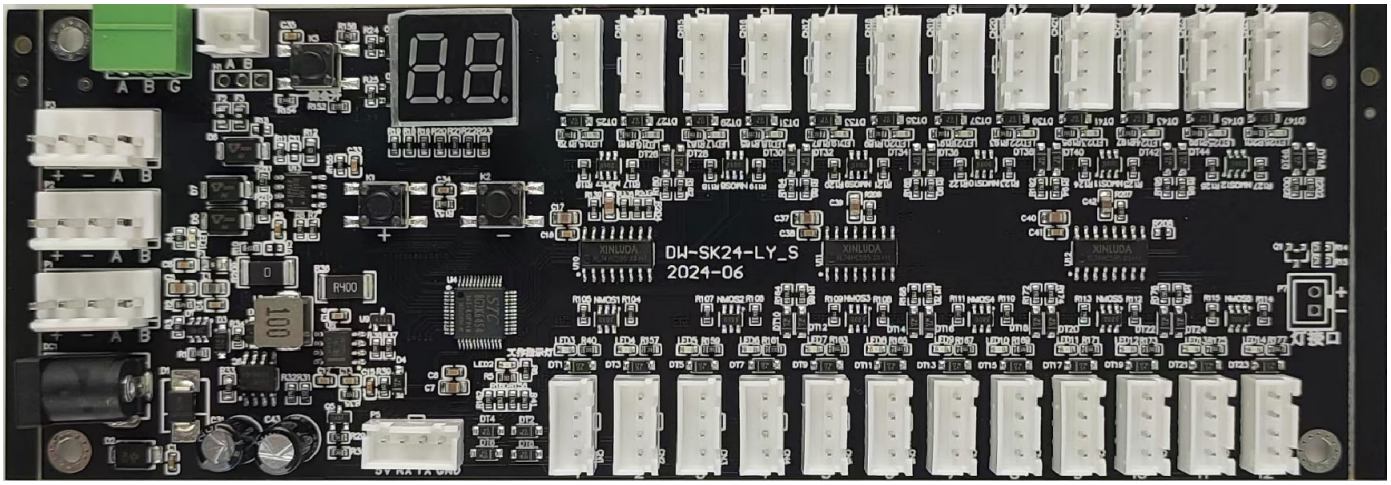
Thank you for purchasing the DW-SK24-LY series lock control panel product from Suzhou Dewo Intelligent System Co., Ltd. (hereinafter referred to as DEWO SMART).

Mainly includes the following contents:

DW-SK24-LY lock control board user manual

1 Product Overview

1.1 Features



The DW-SK24-LY series lock control board is an electromagnetic lock control board independently developed by our company for cabinet application industries such as smart express cabinets and smart storage cabinets. This product has the following features:

1. **Wide voltage range:** compatible with 12V and 24V application scenarios

2. **High reliability:** TVS protection and self-recovery fuse design are added to the main circuit

3. **Online upgrade:** The lock control board program can be upgraded online through the RS485 interface

4. **Test program:** Free Windows version test software is provided to facilitate development and debugging

5. **Software customization:** According to different application scenarios, software protocols and software functions can be customized according to customer needs

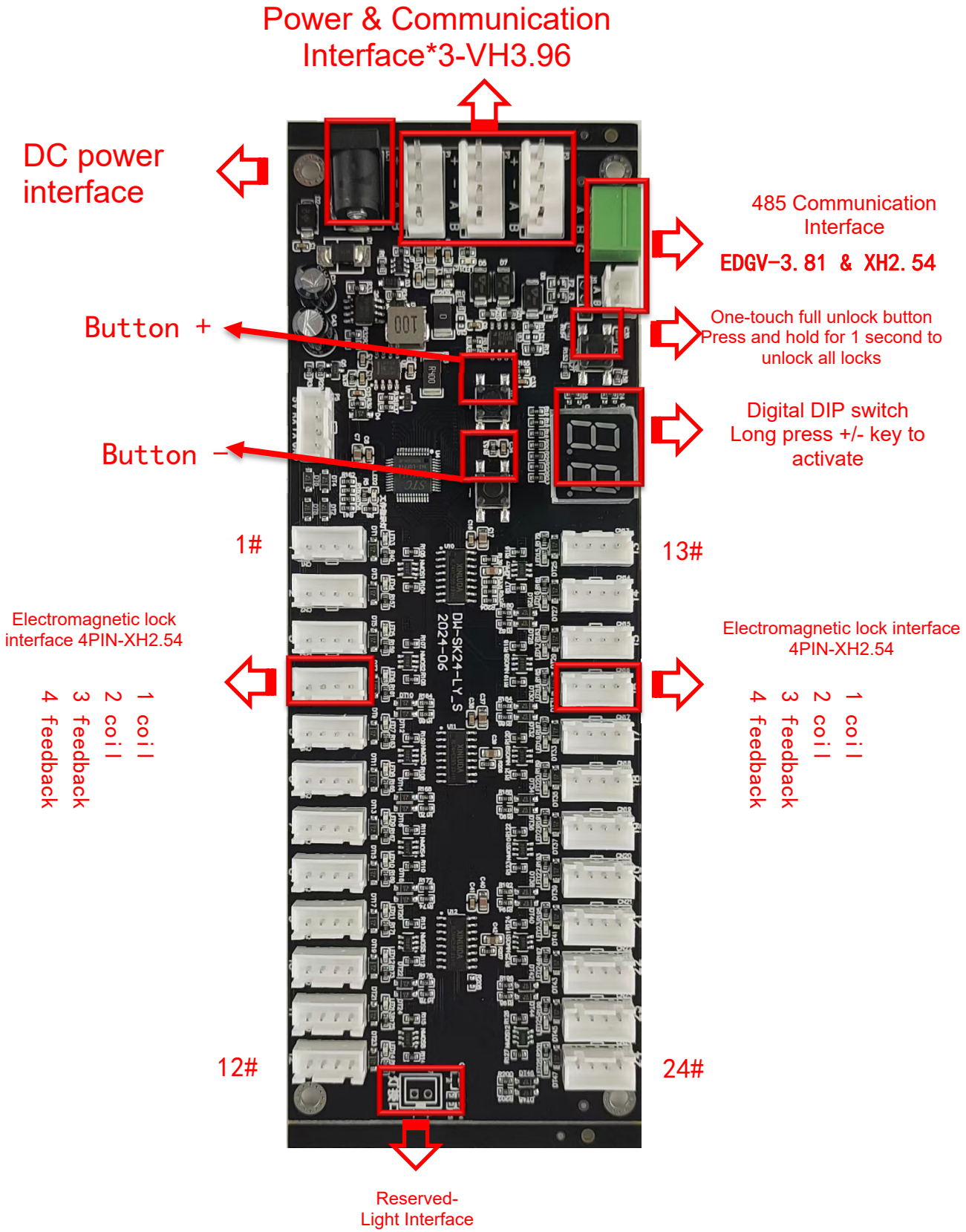
1.2 Product Specifications

Table 1- 1 Product specifications

Item	Specifications (24 channels)
CPU	STC industrial-grade microcontroller
Operating voltage	DC9V~DC30V
Communication interface	RS485
Electromagnetic lock interface	24 channels
Relay control	1 channel (optional)
Unlocking time	About 300ms
DIP switch	7 bits
Product size	202mm*72mm

2 Hardware Interface

2.1 DW-SK24-LY Interface Definition



2.3 Hardware Description

1. Power communication interface

The two power communication interfaces on the control board are completely equivalent, one is used to connect to the host computer, and the other is used to cascade the next lock control board

2. Board address dial

The dial uses a 7-bit dial switch. The numbers "1" to "7" represent bit0~bit7 respectively. The switch is turned to the ON side for 1 and to the digital side for 0.

1) If bit0 is turned to the ON side and the others are turned to the digital side, the board address is 1.

2) If bit1 is turned to the ON side and the others are turned to the digital side, the board address is 2.

3) If bit0 and bit1 are turned to the ON side and the others are turned to the digital side, the board address is 3

And so on...

3. Electromagnetic lock control interface

1) When controlling the electromagnetic lock, the time to open a single electromagnetic lock is about 300ms.

2) The electromagnetic lock control interface can also be controlled by command to be normally open or normally closed, which is used to control long-powered peripherals such as LED lights. For details on electromagnetic lock control commands, normally open and normally closed commands, please refer to the communication protocol section in Chapter 4 of this document.

3 Test Procedure Description

In order to facilitate users to develop application layer software and test the lock board, we provide a free Windows version of the lock control board test program.

Instructions:

1) Connect the lock board and computer correctly, power on the lock control board, and open the test software

2) Select the correct serial port, the serial port will automatically open according to the configuration of "9600, N, 8, 1"

3) According to the lock board dial address, set the "lock control board dial address" on the software, and then click "Connect lock control board" After the lock control board is successfully connected, the basic configuration information of the lock control board will be displayed

4) After the connection is successful, you can test it.

Note: a) The "Channel Normally Open" function is to make the lock channel always powered. This function can be used when a device that requires long-term power supply is connected to the lock socket.

b) The "(Command-HEX) Send" function can send the command entered by the user to the lock board, and the test program will automatically add the CRC8 check value at the end of the sent data, without the need for the user to calculate and input.

4 Communication Protocol

4.1 Protocol Description

The protocol consists of 2 bytes of data header, 1 byte of data length, 1 byte of lower machine address, 1 byte of instruction word, N bytes of data, and 1 byte of check value.

Communication electrical standard: RS485

Communication status standard:

Baud rate: 9600

Start bit: 1

Data bit: 8

Stop bit: 1

Parity bit: None

Communication command format: (sending and receiving data are hexadecimal data), the command and command response format are the same

Data header 1	Data header 2	Data length	Board address	Command word	Data	Check
0xaa	0x55	1 byte	1 byte	1 byte	N byte	crc8

Data length: Length = 1 byte (board address) + 1 byte (instruction) + N bytes (data)

Check: crc8 formula CRC = x8 + x5 + x4 + 1 From the data header 1 to the last byte of the data part, Appendix 1 is a C language version of the CRC8 algorithm example.

4.2 Detailed protocol

The temperature and humidity values involved in the protocol need to be calculated using the corresponding formula (actual temperature/humidity value = (data 1 x 256 + data 2-500)/10).

1）Unlock command

The command format sent by the host computer is:

Frame header 1	Frame header 2	Data length	Board address	Command	Lock adderss	Check
0xaa	0x55	0x03	0xXX	0x50	0xXX	Crc8

Note: The lock address starts from 0, 0 represents lock number 1

The lock control panel reply command format:

Frame header 1	Frame header 2	Data length	Board address	Com mand	Lock adderss	Check
0xaa	0x55	0x08	0xXX	0x50	(6 字节)	Crc8

Data: 6 bytes of data, a total of 48 bits, each bit corresponds to the state of a lock, 0 means the electromagnetic lock micro switch is disconnected, 1 means the micro switch is closed, the state of the corresponding door depends on the design of the lock. When a socket is not connected to an electromagnetic lock, the lock state is the micro switch disconnected.

e bit0~bit7: corresponds to locks 1~8

The second byte bit0~bit7: corresponds to locks 9~16

The third byte bit0~bit7: corresponds to locks 17~24

And so on.

The DW-SK24-LY lock control panel does not have a lock status detection function, so just ignore the status feedback data.

2）Asset Encoding Settings

The command format sent by the host computer is:

Frame header 1	Frame header 2	Data length	Board address	Com mand	Lock adderss (N byte)	Check
0xaa	0x55	N+2	0xXX	0x5F	Max length: 31 bytes	Crc8

The asset code length does not exceed 31 bytes, and the excess will be discarded

The lock control panel reply command format:

Frame header 1	Frame header 2	Data length	Board address	Comma nd	Lock adderss (1 byte)	Check
0xaa	0x55	0x03	0xXX	0x5F	1: Write successful Other: Write failed	Crc8

3）Asset Code Query

The command format sent by the host computer is:

Frame header 1	Frame header 2	Data length	Board address	Comma nd	Lock adderss (1 byte)	Check
0xaa	0x55	0x03	0xXX	0x60		Crc8

Data: The length of the asset code to read

The lock control panel reply command format:

Frame header 1	Frame header 2	Data length	Board address	Comma nd	Lock adderss (1 byte)	Check
0xaa	0x55	N+2	0xXX	0x60		Crc8

Data: N bytes of asset encoding data

4）Version number query

The command format sent by the host computer is:

Frame header 1	Frame header 2	Data length	Board address	Command	Check
0xaa	0x55	0x02	0xXX	0x7B	Crc8

The lock control panel reply command format:

Frame header 1	Frame header 2	Data length	Board address	Command	Lock adderss (N byte)	Check
0xaa	0x55	N+2	0xXX	0x7B	Version No.	Crc8

Data: Version number, example: "DW-SK-HW-V1.00"

5）Open all locks

The command format sent by the host computer is:

Frame header 1	Frame header 2	Data length	Board address	Command	Check
0xaa	0x55	0x02	0xXX	0xF0	Crc8

Note: The lock board does not respond to this instruction, and the time to open a single lock is about 500ms.

6）Lock channel normally open/normally closed control

The command format sent by the host computer is:

Frame header 1	Frame header 2	Data length	Board address	Command	Lock address	Data	Check
0xaa	0x55	0x04	0xXX	0x41	0xXX	0: Normally closed 1: Normally open	Crc8

Note: 1) This command is applicable to the case where the channel is always open to power peripherals that require long-term power supply, such as LED lights. 2) If a channel is connected to an electromagnetic lock, the electromagnetic lock and lock board may be burned out after the channel is always open. Please use it with caution.

Lock control board reply command format:

Frame header 1	Frame header 2	Data length	Board address	Command	Lock address	Data	Check
0xaa	0x55	0x04	0xXX	0x41	0xXX	0：常闭 1：常开	Crc8

5 Appendix 1

/*

Function name: u8 Get_CRC8(u8 *MsgRxBuff, u8 len)

Function: Calculate the check value //Check: crc8 formula CRC = x8 + x5 + x4 + 1 Starting from the data header

Input parameters:

MsgRxBuff: Pointer to the buffer where the data to be checked is stored

len: Data length (bytes)

Return value: None

Change time: 2019-04-11

*/

```
u8crc8_chkvalue(u8 *MsgRxBuff,u8 len)
{
    u8crc=0;
    u8 i;
    crc=0;

    while(len--!=0)
    {
        crc^=*MsgRxBuff++;
        for(i=0;i<8;i++)
        {
            if(crc&0x01)
            {
                crc=(crc>>1)^0x8c;
            }
            elsecrc>>=1;
        }
    }
    returncrc;
}
```