**2 channel rs485 commamd**

**AT commands (ASCII characters)**

Note:

1 In the AT command mode slave ID is invalid

2 AT commands must be uppercase, lowercase invalid

3 DIP switch status: A5 must be OFF state, A0-A4 random state

9600 Band ,8 Data bits,None Parity,1 Stop Bit

Read Status:

Channel 1: AT+R1

Channel 2: AT+R2

Open :

Channel 1 : AT+O1

Channel 2 : AT+O2

Close:

Channel 1 : AT+C1

Channel 2 : AT+C2

Toggle (Self-locking)

Channel 1: AT+T1

Channel 2: AT+T2

Latch (Inter-locking)

Channel 1: AT+L1

Channel 2: AT+L2

Momentary (Non-locking)

Channel 1: AT+M1

Channel 2: AT+M2

Delay

Channel 1: AT+D1=XXXX

Channel 2: AT+D2=XXXX

XXXX refers to the 0000 to 9999 figures, Unit is seconds

Return command : OpenX, CloseX (X = 1 or 2)

Example 1:

Send command "AT+D1=0010", Channel 1 is "Open", after delay of 10 seconds, channel 1 is "Close"

Send command "AT+D2=0100", Channel 2 is "Open", after delay of 100 seconds, channel 2 is "Close"

Example 2:

Send command "AT+L1", Channel 1 is "Open", Channel 2 is "Close"

Send command "AT+L2", Channel 2 is "Open", Channel 1 is "Close"

Send command "AT+L3", Channel 1 is "Close", Channel 2 is "Close"

**MODBUS command (function code 06 is Control command,03 is Read status command)**

Note :

1 MODBUS command must be HEX

2 Slave ID (device address) must be consistent with the DIP switches (A0-A4)

3 A5 pin of DIP switch must be ON state



9600 Band ,8 Data bits,None Parity,1 Stop Bit。

**MODBUS** 06 Command (**Control command** ,HEX):

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bytes Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| MODBUS Definitions | Slave ID | Function |  Address |  Data | CRC Check |
| Function | Device Address | Function | Channel number | Command | Delay time | CRC Check |
| Open | 0x00-0x1F | 0x06 | 0x00010x0002 | 0x01 | 0x00 | 2Bytes CRC |
| Close | 0x00-0x1F | 0x06 | 0x00010x0002 | 0x02 | 0x00 | 2Bytes CRC |
| Toggle (Self-locking) | 0x00-0x1F | 0x06 | 0x00010x0002 | 0x03 | 0x00 | 2Bytes CRC |
| Latch Inter-locking) | 0x00-0x1F | 0x06 | 0x00010x0002 | 0x04 | 0x00 | 2Bytes CRC |
| Momentary (Non-locking) | 0x00-0x1F | 0x06 | 0x00010x0002 | 0x05 | 0x00 | 2Bytes CRC |
| Delay | 0x00-0x1F | 0x06 | 0x00010x0002 | 0x06 | 0x00-0xff | 2Bytes CRC |

Remarks:

1 Momentary mode, delay time is 0.5 seconds

2 Delay mode, delay time is 0-255 seconds

Return command：

Command is active, return to send commands; instruction is invalid no return.

**MODBUS** 03 Command (**Read status command** ,HEX):

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bytes Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| MODBUS Definitions | Slave ID | Function |  Address |  Data | CRC Check |
| Function | Device Address | Function | Starting register address | Register length | CRC Check |
| Read Channel 1 State | 0x00-0x1F | 0x03 | 0x0001 | 0x0001 |  |
| Read Channel 2 State | 0x00-0x1F | 0x03 | 0x0002 | 0x0001 |  |
| Read Channel 1And Channel 2 State | 0x00-0x1F | 0x03 | 0x0001 | 0x0002 |  |

Read status command returns (function code 03, HEX format):

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Bytes length | 1 | 1 | 1 |  | 2 |
| MODBUS Definitions | Slave ID | Function | data length |  data | CRC16 Check |
| Function | Device Address | Function | data length | Relay state0x0001 open0x0000 close | CRC16 Check |
| Channel 1open | 0x00-0x1F | 0x03 | 0x02 | 0x0001 |  |
| Channel 1close | 0x00-0x1F | 0x03 | 0x02 | 0x0000 |  |
| Channel 2open | 0x00-0x1F | 0x03 | 0x02 | 0x0001 |  |
| Channel 2close | 0x00-0x1F | 0x03 | 0x02 | 0x0000 |  |
| Channel 1 openChannel 2 open | 0x00-0x1F | 0x03 | 0x04 | 0x0001 0x0001 |  |
| Channel 1 openChannel 2 close | 0x00-0x1F | 0x03 | 0x04 | 0x0001 0x0000 |  |
| Channel 1 closeChannel 2 open | 0x00-0x1F | 0x03 | 0x04 | 0x0000 0x0001 |  |
| Channel 1 closeChannel 2 close | 0x00-0x1F | 0x03 | 0x04 | 0x0000 0x0000 |  |

MODBUS commands you can use "Modbus Poll" input, as shown below

（CRC check generated automatically）



You can also use HyperTerminal serial input, as shown below

（Manually add CRC check）



Examples (Slave ID is 1,DIP switch state)

Channel 1 Open ：01 06 00 01 01 00 D9 9A

Channel 1 Close ：01 06 00 01 02 00 D9 6A

Channel 1 Toggle：01 06 00 01 03 00 D8 FA

Channel 1 Latch：01 06 00 01 04 00 DA CA

Channel 1 Momentary: 01 06 00 01 05 00 DB 5A

Channel 1 Delay 10 seconds : 01 06 00 01 06 0A 5B AD

Channel 1 Delay 100 seconds: 01 06 00 01 06 64 DA 41

Channel 2 Open ：01 06 00 02 01 00 29 9A

Channel 2 Close ：01 06 00 02 02 00 29 6A

Channel 2 Toggle ：01 06 00 02 03 00 28 FA

Channel 2 Latch ：01 06 00 02 04 00 2A CA

Channel 2 Momentary : 01 06 00 02 05 00 2B 5A

Channel 2 Delay 10 seconds : 01 06 00 02 06 0A AB AD

Channel 2 Delay 100 seconds : 01 06 00 02 06 64 2A 41

Read state (assuming that the channel 1 is open, the channel 2 is close).

Read channel 1 state ：01 03 00 01 00 01 D5 CA

Return open：01 03 02 00 01 79 84

Read channel 2 state ：01 03 00 02 00 01 25 CA

Return close：01 03 02 00 00 B8 44

Read channel 1 and channel 2 state ：01 03 00 01 00 02 95 CB

Return channel open and channel 2 close ：01 03 04 00 01 00 00 AB F3

**CRC check code(C51 MCU)：**

const unsigned char code auchCRCHi[256] = {

0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,

0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,

0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,

0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,

0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,

0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,

0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,

0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,

0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,

0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,

0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,

0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,

0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,

0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,

0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,

0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40

} ;

const unsigned char code auchCRCLo[256] = {

0x00, 0xC0, 0xC1, 0x01, 0xC3, 0x03, 0x02, 0xC2, 0xC6, 0x06, 0x07, 0xC7, 0x05, 0xC5, 0xC4,0x04,

0xCC, 0x0C, 0x0D, 0xCD, 0x0F, 0xCF, 0xCE, 0x0E, 0x0A, 0xCA, 0xCB, 0x0B, 0xC9, 0x09, 0x08, 0xC8,

0xD8, 0x18, 0x19, 0xD9, 0x1B, 0xDB, 0xDA, 0x1A, 0x1E, 0xDE, 0xDF, 0x1F, 0xDD, 0x1D, 0x1C, 0xDC,

0x14, 0xD4, 0xD5, 0x15, 0xD7, 0x17, 0x16, 0xD6, 0xD2, 0x12, 0x13, 0xD3, 0x11, 0xD1, 0xD0, 0x10,

0xF0, 0x30, 0x31, 0xF1, 0x33, 0xF3, 0xF2, 0x32, 0x36, 0xF6, 0xF7, 0x37, 0xF5, 0x35, 0x34, 0xF4,

0x3C, 0xFC, 0xFD, 0x3D, 0xFF, 0x3F, 0x3E, 0xFE, 0xFA, 0x3A, 0x3B, 0xFB, 0x39, 0xF9, 0xF8, 0x38,

0x28, 0xE8, 0xE9, 0x29, 0xEB, 0x2B, 0x2A, 0xEA, 0xEE, 0x2E, 0x2F, 0xEF, 0x2D, 0xED, 0xEC, 0x2C,

0xE4, 0x24, 0x25, 0xE5, 0x27, 0xE7, 0xE6, 0x26, 0x22, 0xE2, 0xE3, 0x23, 0xE1, 0x21, 0x20, 0xE0,

0xA0, 0x60, 0x61, 0xA1, 0x63, 0xA3, 0xA2, 0x62, 0x66, 0xA6, 0xA7, 0x67, 0xA5, 0x65, 0x64, 0xA4,

0x6C, 0xAC, 0xAD, 0x6D, 0xAF, 0x6F, 0x6E, 0xAE, 0xAA, 0x6A, 0x6B, 0xAB, 0x69, 0xA9, 0xA8, 0x68,

0x78, 0xB8, 0xB9, 0x79, 0xBB, 0x7B, 0x7A, 0xBA, 0xBE, 0x7E, 0x7F, 0xBF, 0x7D, 0xBD, 0xBC, 0x7C,

0xB4, 0x74, 0x75, 0xB5, 0x77, 0xB7, 0xB6, 0x76, 0x72, 0xB2, 0xB3, 0x73, 0xB1, 0x71, 0x70, 0xB0,

0x50, 0x90, 0x91, 0x51, 0x93, 0x53, 0x52, 0x92, 0x96, 0x56, 0x57, 0x97, 0x55, 0x95, 0x94, 0x54,

0x9C, 0x5C, 0x5D, 0x9D, 0x5F, 0x9F, 0x9E, 0x5E, 0x5A, 0x9A, 0x9B, 0x5B, 0x99, 0x59, 0x58, 0x98,

0x88, 0x48, 0x49, 0x89, 0x4B, 0x8B, 0x8A, 0x4A, 0x4E, 0x8E, 0x8F, 0x4F, 0x8D, 0x4D, 0x4C, 0x8C,

0x44, 0x84, 0x85, 0x45, 0x87, 0x47, 0x46, 0x86, 0x82, 0x42, 0x43, 0x83, 0x41, 0x81, 0x80,0x40

} ;

unsigned int CRC\_16(unsigned char \*str,unsigned int usDataLen)

{

 unsigned char uchCRCHi = 0xFF ; /\* high byte of CRC initialized \*/

 unsigned char uchCRCLo = 0xFF ; /\* low byte of CRC initialized \*/

 unsigned uIndex ; /\* will index into CRC lookup table \*/

 while (usDataLen--)/\* pass through message buffer \*/

 {

 uIndex = uchCRCHi ^ \*str++ ; /\* calculate the CRC \*/

 uchCRCHi = uchCRCLo ^ auchCRCHi[uIndex];

 uchCRCLo = auchCRCLo[uIndex] ;

 }

 return (uchCRCHi << 8 | uchCRCLo) ;

}