

WECON

Programming



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RS Instructions

1. Instruction Description

Name	Function	Bits(bits)	Pulse type	Instruction format	Step
RS	Serial data transfer	16	No	RS (S) (m) (D) (n)	9

Operand	Bit component				Word component										
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	V	Z
(S)													✓		
(m)					✓	✓							✓		
(D)													✓		
(n)					✓	✓							✓		

This instruction is a communication transceiver instruction. It sends the data in specified register to the serial ports automatically, and store the data to the designated area. This is equivalent to that the user program accesses the communication buffer directly, deals with the communication receiving and sending buffer with the user program, and achieves a custom communication protocol. Among:

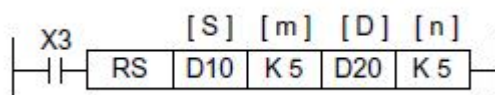
(S) is the initial address of the register area where the data to be sent will be stored;

(m) is the length of the data to be sent (bytes), ranges (0~256);

(D) is the initial address of the storage register which receives communication data;

(n) is the length of the communication data received (bytes), ranges (0~256).

2.Operation:



This instruction performs the direct control of communications over LX series PLC communication.COM1 can not support the RS instruction.COM2 support RS instruction.

Points to note:

a) This instruction has many automatically defined devices. These are listed in the boxed column to the right of this page.

b) The RS instruction has two parts, send (or transmission) and receive. The first elements of the RS instruction specify the transmission data buffer (S) as a head address, which contains m number of elements in a sequential stack.

The specification of the receive data area is contained in the last two parameters of the RS instruction. The destination (D) for received messages has a buffer or stack length of n data elements. The size of the send and receive buffers dictates how large a single message can be. Buffer sizes may be updated at the following times:

- 1) Transmit buffer - before transmission occurs, i.e. before M8122 is set ON

2) Receive buffer - after a message has been received and before M8123 is reset.

c) Data cannot be sent while a message is being received, the transmission will be delayed - see M8121.

d) More than one RS instruction can be programmed but only one may be active at any one time.

Assigned devices

Data devices:

D8120 - Contains the configuration parameters for communication, i.e. Baud rate, Stop bits etc. Full details over the page

D8122 - Contains the current count of the number of remaining bytes to be sent in the currently transmitting message.

D8123 - Contains the current count of the number of received bytes in the 'incoming' message.

D8124 - Contains the ASCII code of the character used to signify a message header - default is 'STX', 02 HEX.

D8125 - Contains the ASCII code of the character used to signify a message terminator - default is 'ETX', 03 HEX.

Operational flags:

M8121 - This flag is ON to indicate a transmission is being delayed until the current receive operation is completed.

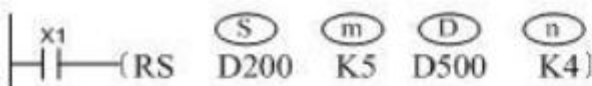
M8122 - This flag is used to trigger the transmission of data when it is set ON.

M8123 - This flag is used to identify (when ON) that a complete message has been received.

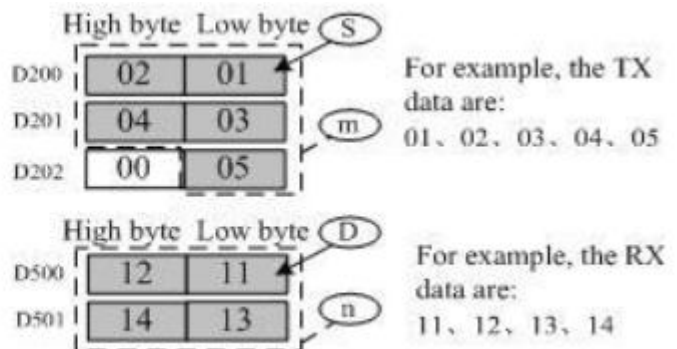
M8124 - Carrier detect flag. This flag is for use with FX and FX2C Main Processing Units. It is typically useful in modem communications

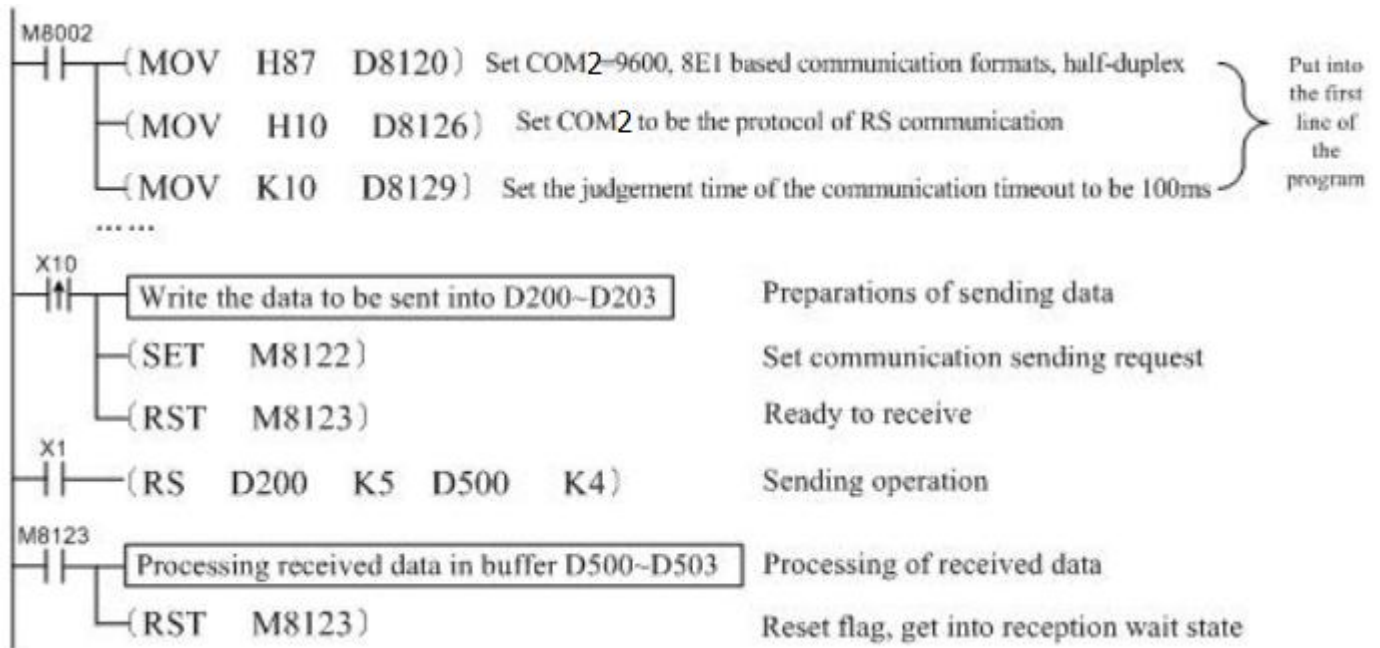
M8161 - 8 or 16 bit operation mode ON = 8 bit mode where only the lower 8 bits in each source or destination device are used, i.e. only one ASCII character is stored in one data register OFF = 16bit mode where all of the available source/ destination register is used, i.e. two ASCII characters are stored in each data register.

3. Programming example



In the case of LX series PLC, RS instruction can only be used for COM2 communication port; COM2 communication port does not support RS instruction. When X1=ON, the RX and TX data after instruction execution are saved as show in the right diagram.



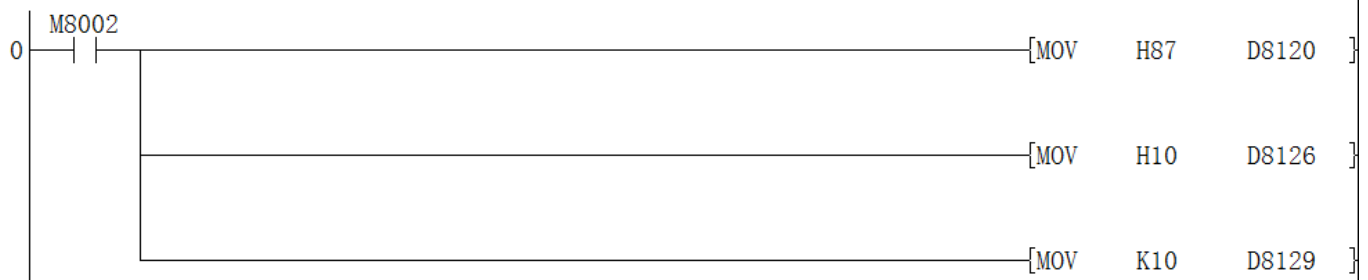


4. PLC monitor

```

/*
 * RS instruction
 */
/*
 * D8120 set the communication parameters
 */
/*
 * D8126: protecol setting
 */
/*
 * D8129 time out setting
 */

```



```

/*
 * If M8122=1, means RS ready to send data
 */
/*
 * If M8123=0, means RS ready to receive data
 */

```



M8120 and M8126 setting

Communication Format (D8120)

Item	parameter	Bit value of D8120							
		b7	b6	b5	b4	b3	b2	b1	b0
Baud rate (Bps)	115200	1	1	0	0	-	-	-	-
	57600	1	0	1	1	-	-	-	-
	38400	1	0	1	0	-	-	-	-
	19200	1	0	0	1	-	-	-	-
	9600	1	0	0	0	-	-	-	-
	4800	0	1	1	1	-	-	-	-
Stop bit	1 bit	-	-	-	-	0	-	-	-
	2 bit	-	-	-	-	1	-	-	-
Parity	None	-	-	-	-	-	0	0	-
	Odd	-	-	-	-	-	0	1	-
	Even	-	-	-	-	-	1	1	-
Data bit	7 bit	-	-	-	-	-	-	-	0
	8 bit	-	-	-	-	-	-	-	1
Example: the communication format is 9600.1.8.None, b7b6b5b4=1000, b3=0, b2b1=00, b0=1. D8120=81H ((10000001) ₂ =81H, 81H means hexadecimal number)									

Protocol Setting (D8126)

Protocol	Description	Value of D8126
WECON PLC Protocol	Using WECON PLC Protocol	01H
MODBUS RTU Master	PLC is slave device	02H
MODBUS ASCII Master	PLC is slave device	03H
MODBUS RTU Slave	PLC is master device	20H
MODBUS ASCII Slave	PLC is master device	30H

(If D8126=10H,it means Protocol of RS communication)

WECON PLC - MODBUS (Slave) addresses rules

PLC Bit Address		
PLC Address	MODBUS Address	
	Hex	Decimal
M0 ~ M3071	0 ~ 0xBFF	0 ~ 3071
M8000 ~ M8256	0x1F40 ~ 0x2040	8000 ~ 8256
S0 ~ S999	0xE000 ~ 0xE3E7	57344 ~ 58343
T0 ~ T256	0xF000 ~ 0xF100	61440 ~ 61696
C0 ~ C255	0xF400 ~ 0xF4FF	62464 ~ 62719
X0 ~ X255	0xF800 ~ 0xF9FE	63488 ~ 63998
Y0 ~ Y255	0xFC00 ~ 0xFDFE	64512 ~ 65022
PLC Word Address		
PLC Address	MODBUS Address	
	Hex	Decimal
D0 ~ D8255	0 ~ 0x203F	0 ~ 8255
T0 ~ T255	0xF000 ~ 0xF0FF	61440 ~ 61695
C0 ~ C199	0xF400 ~ 0xF4C7	62464 ~ 62663
C200 ~ C255	0xF700 ~ 0xF7FF	63232 ~ 63487

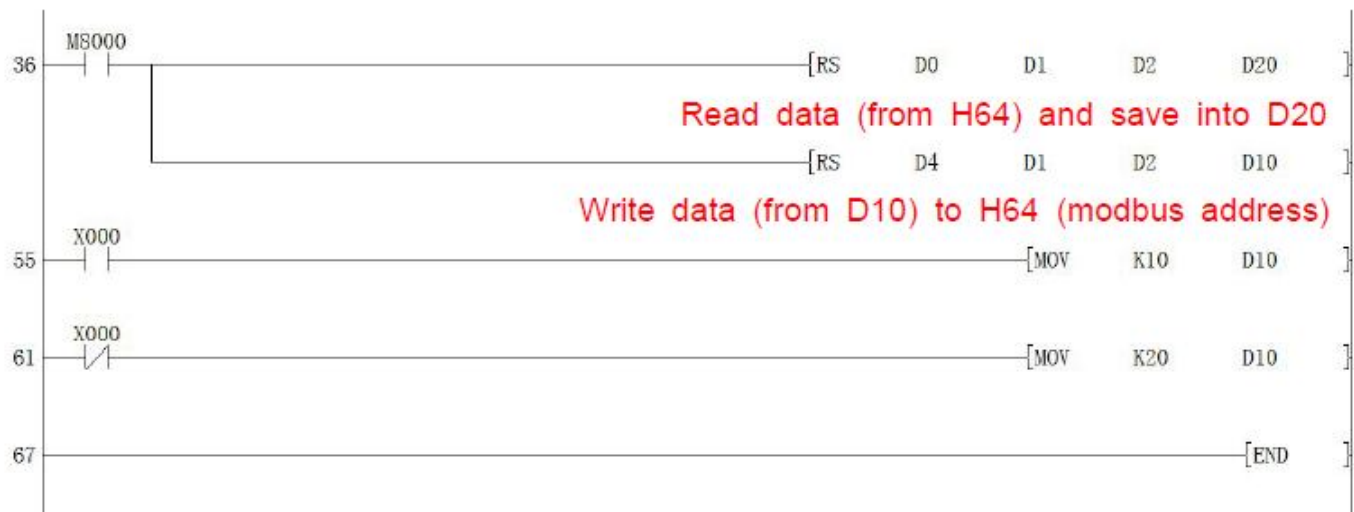
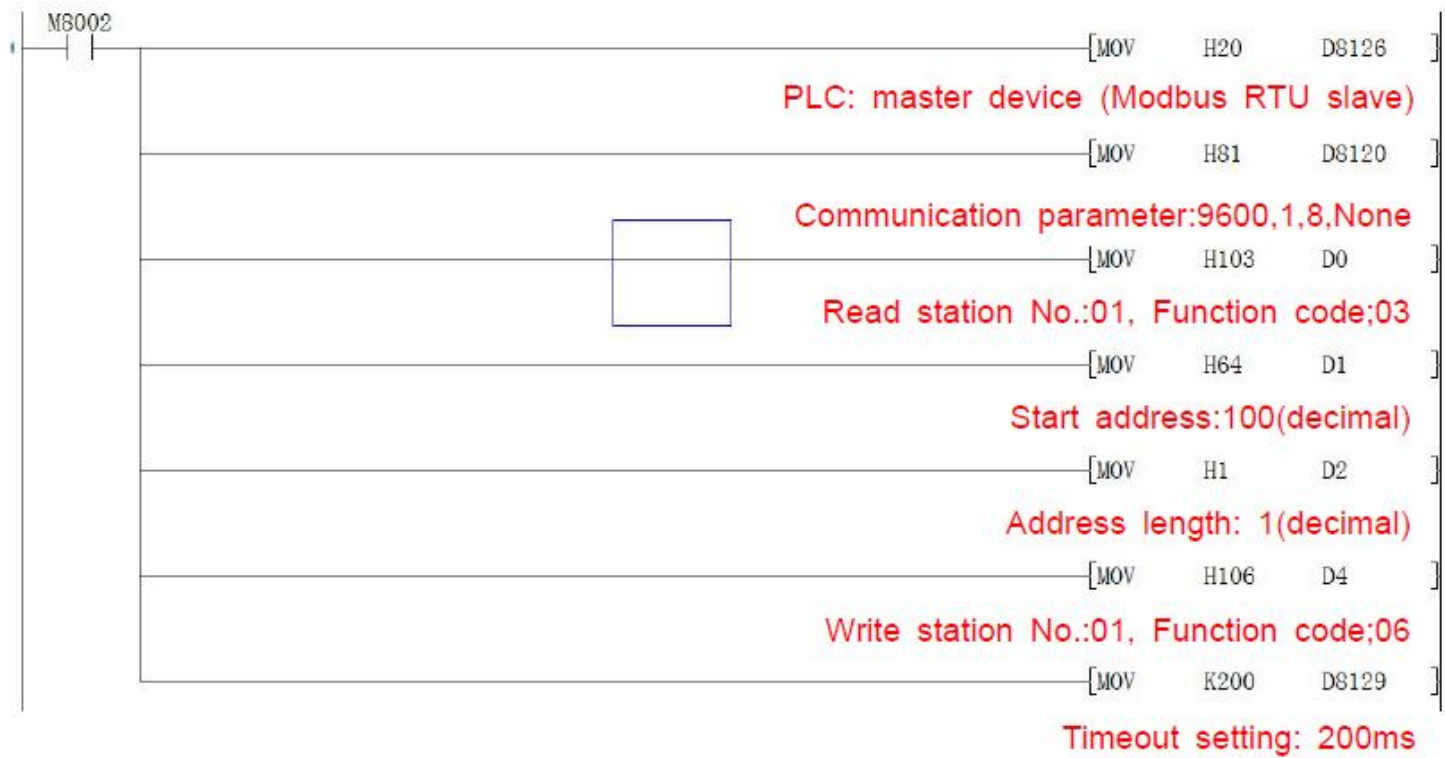
MODBUS Function Code Introduction (word)

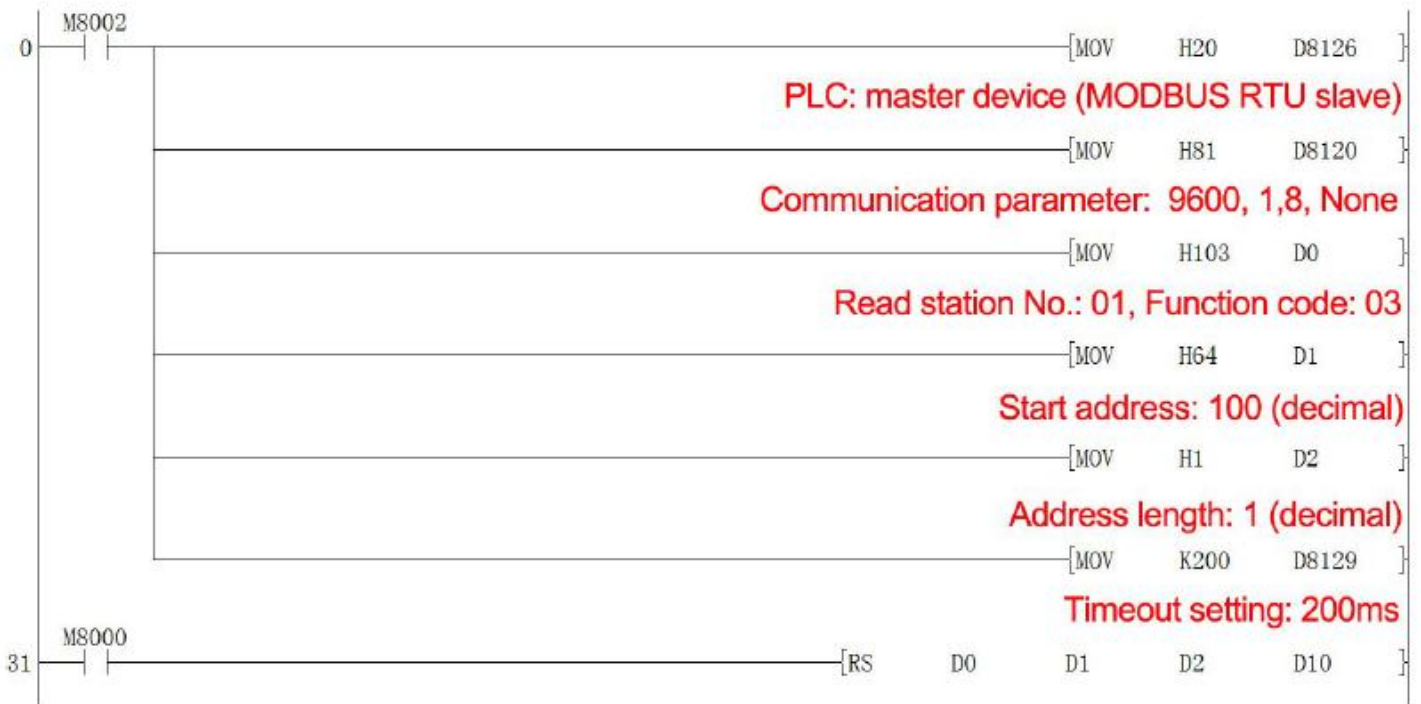
Function Code - Word			
Address Type	Function Code (Hex)	Length	Read / Write
3	04 (Read)	16 bits	√
	06 (Write single address)		
	10 (Write continued addresses)		
4	03 (Read)	16 bits	√
	06 (Write single address)		
	10 (Write continued addresses)		
W6	03 (Read)	16 bits	√
	06 (Write single address)		
	10 (Write continued addresses)		

W16	03 (Read)	16 bits	√
	0F (Write continued addresses)		

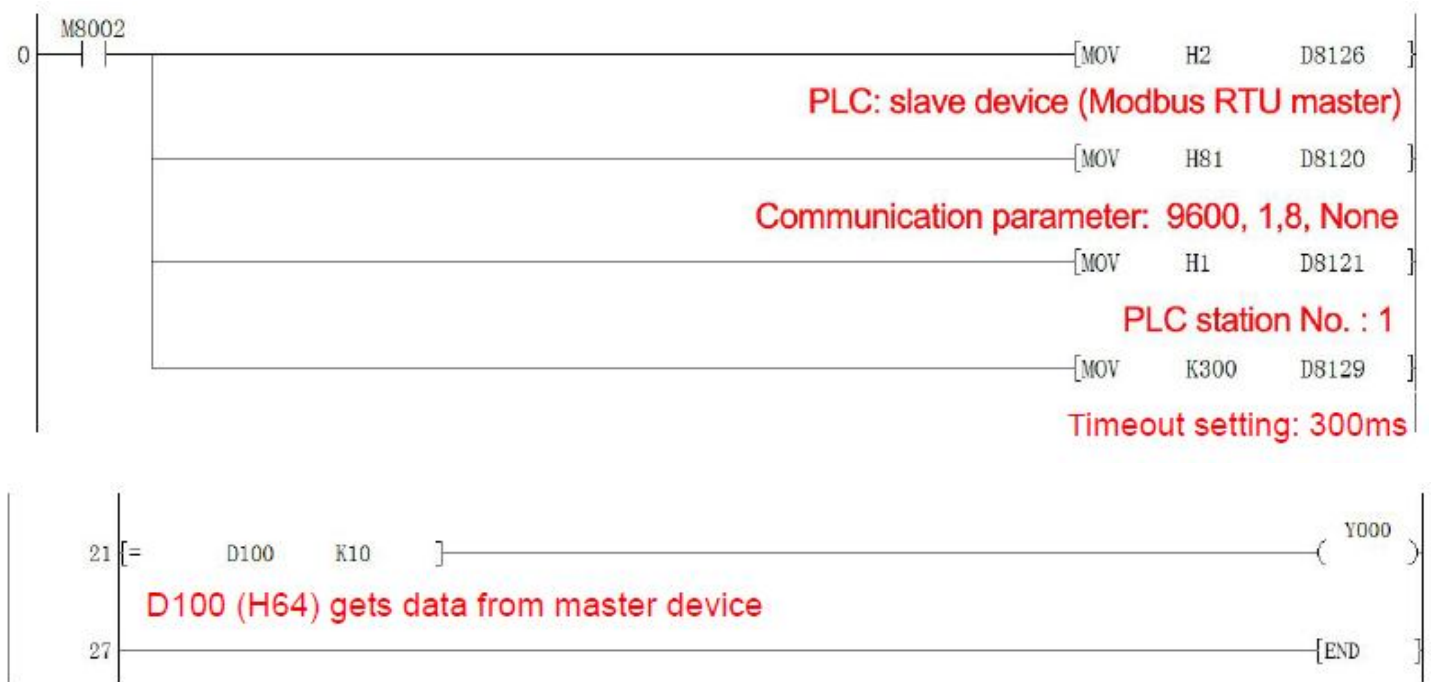
Function Code - Bit			
Address Type	Function Code (Hex)	Length	Read / Write
0	01 (Read)	bit	√
	05 (Write single address)		
	0F (Write continued addresses)		
1	02 (Read)	bit	√
	05 (Write single address)		
	0F (Write continued addresses)		
W5	01(Read)	bit	√
	05 (Write single address)		
	0F (Write continued addresses)		
W15	01(Read)	bit	√
	0F (Write continued addresses)		

EXAMPLE 1 : PLC is master device





EXAMPLE 2 : PLC is slave device



EXAMPLE 3 : WECON PLC Protocol (COM2)

