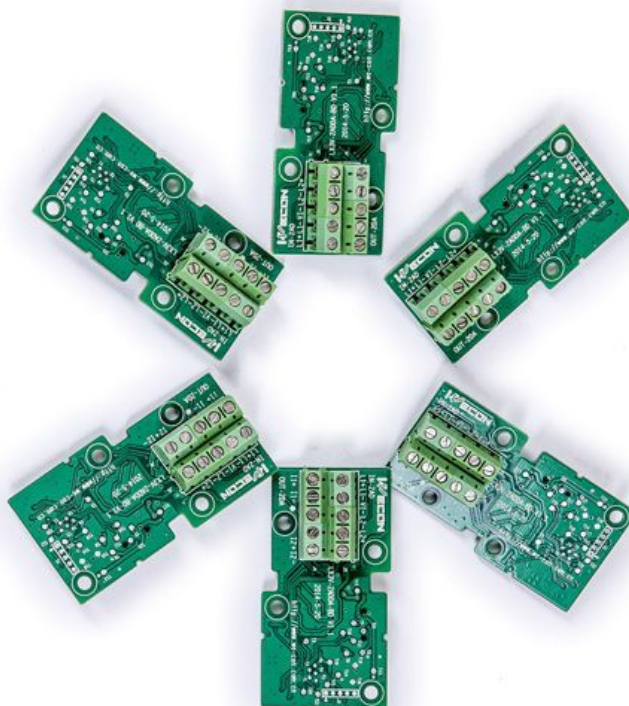


WECON

LX3V-RS458-BD

Board



WECON Technology Co., Ltd.

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Skype: fcwkkj

Phone: 86-591-87868869

Technical forum: <http://wecon.freeforums.net/>

WECON Technology Co., Ltd.

I . Mounting instruction

Make sure to power off the PLC before mounting the 2PT2DA module and remove the top cover of PLC, screwed to the PLC.

Caution: when output current, make sure that the load resistance should be less than 500Ω, otherwise the output will be lower.

Warring: make sure to power off the PLC before mounting or removing the BD module.

II . The features of LX3V-RS485-BD

LX3V-RS485-BD is used for communication via RS485, it can be installed on PLC, it has the following purposes.

1. Data transmission by no-protocol

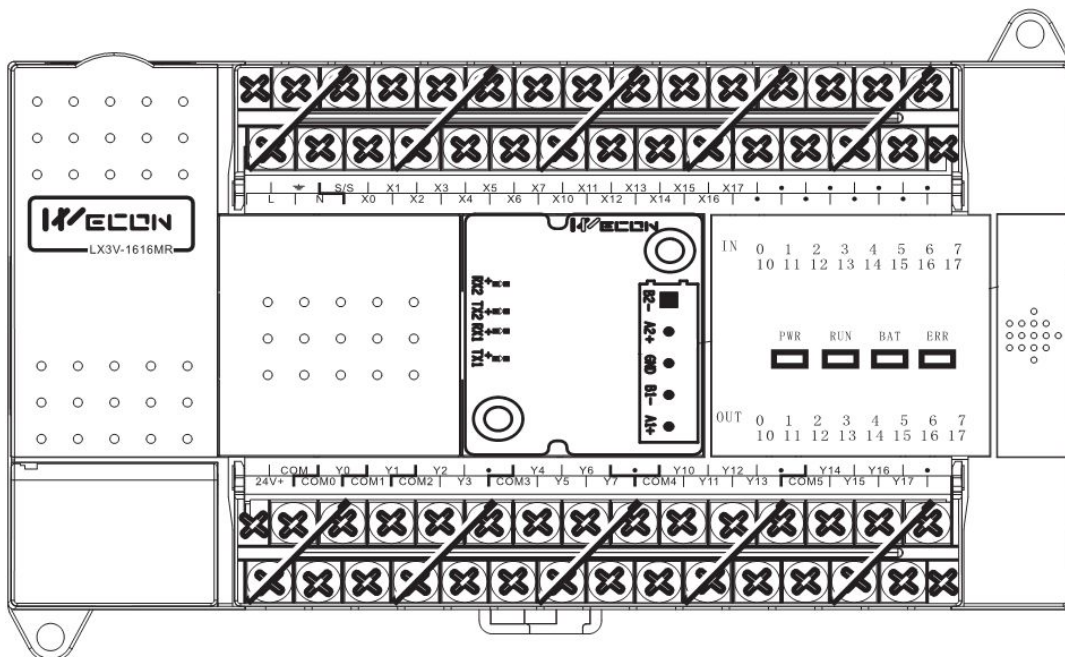
Data transmit to designation register's address by RS command.

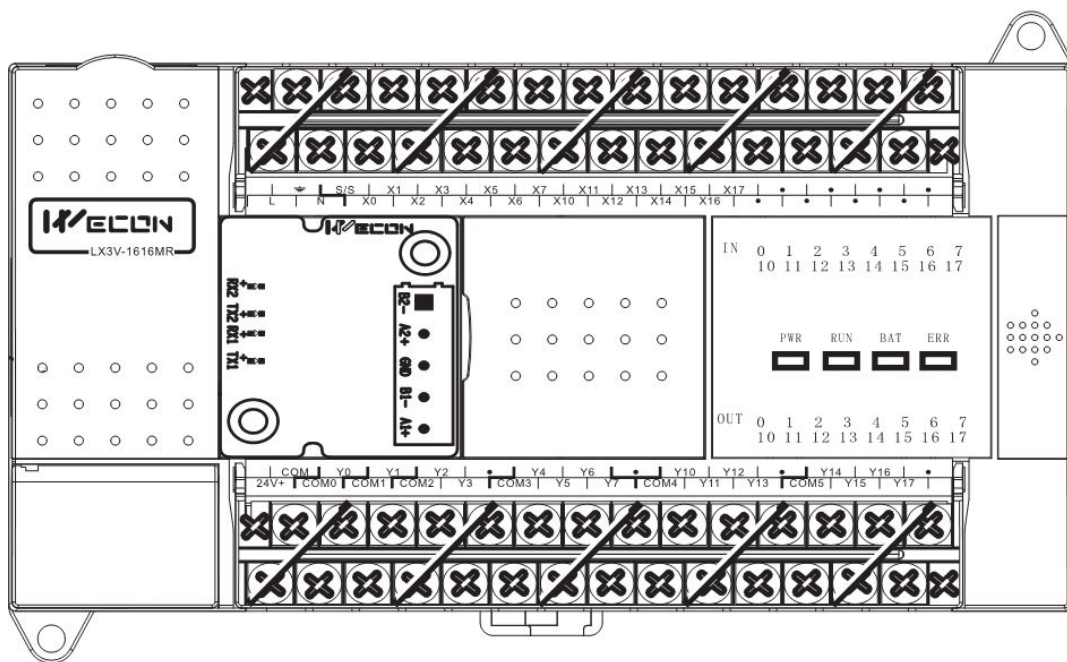
2. Data transmission by proprietary protocol

Data transimission is in based on 1: N via RS485.

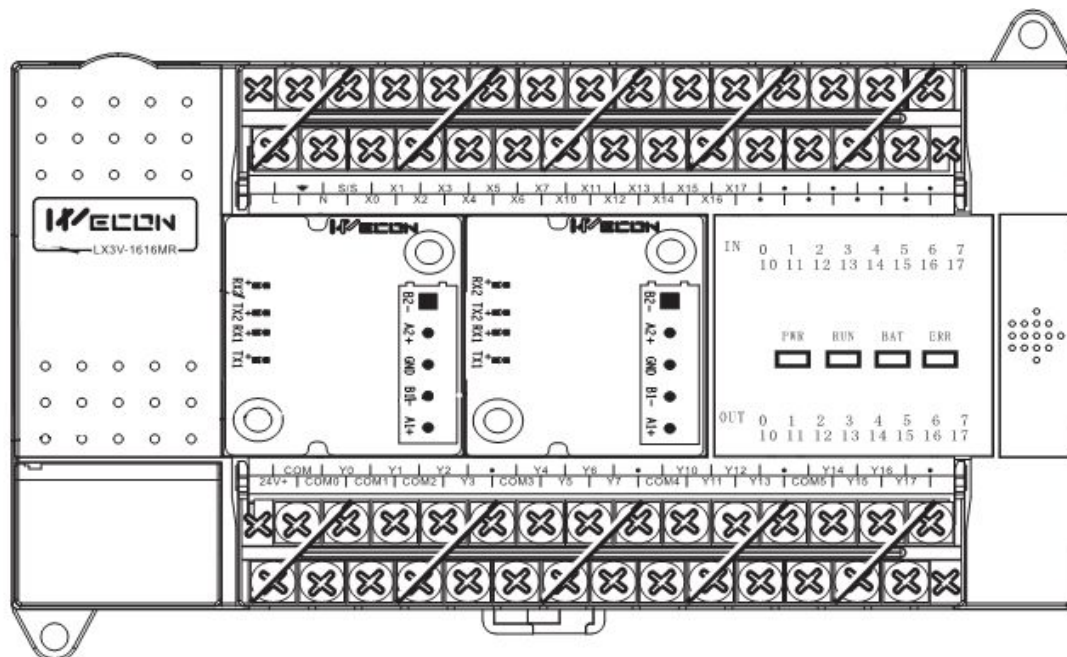
III. Terminal Description and shape

1. Only installed one BD board





2. Installed two BD board



IV. Function of serial communication

Serial Num	Protocol
COM 1	It supports download and HMI monitoring protocols, supports RS422 and RS485 .
COM 2	It supports HMI monitoring protocol, MODBUS RTU protocol, RS command, only supports RS485.

COM 3	It supports MODBUS RTU protocol, RS command, N:N protocol, only supports RS485.
COM 4	It supports MODBUS RTU protocol, RS command, N:N protocol, only supports RS485.
COM 5	It supports MODBUS RTU protocol, RS command, N:N protocol, only supports RS485.
COM 6	It supports MODBUS RTU protocol, RS command, N:N protocol, only supports RS485.

V. New commands

This BD board uses 2 need commands

1. RS2 command

Name	Function	16 bit	Pulsed	Instruction format	Steps
RS2	Transfer serial data	√	No	RS2 (S) (m) (D) (n) (n1)	11

Operand	Bit device				Word device									
	X	Y	M	S	K	H	KnY	KnM	KnS	T	C	D	V	Z
S												√		
m					√	√						√		
D												√		
n					√	√						√		
n1					√	√						√		

S: Starting address of transmitted data.

m: Length of transmitted data.

D: Starting address for storage data.

n: Length of received data.

n1: Serial port Number, 0 means using COM0, 1 means using COM1



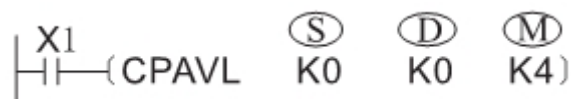
2. CPAVL command

Name	Function				16 bit		Pulsed	Instruction format					Steps	
CPAVL	Communication port parameters				√		No	CPAVL Ⓢ Ⓣ Ⓜ					11	
Operand	Bit device				Word device									
	X	Y	M	S	K	H	KnY	KnM	KnS	T	C	D	V	Z
S					√	√								
D					√	√								
M					√	√								

S: The starting address of “D” device.

D: The starting address of “M” device.

M: Communication serial port parameters.



Setting the parameters of COM4 are in 40 consecutive addresses beginning of D0 and M0.

Bit	Content	Word	Content
D0	Retention	M0	Communication format, defined is 0
D1	Sending(RS2)	M1	Station number, defined is 0
D2	Sending flag (RS2) Instruction state (MODBUS)	M2	Remaining amount of data transmission(RS2) Interval of sending(MODBUS)
D3	Receiving flag(RS2) Communication error flag(MODBUS)	M3	The number of receiving data(RS2)
D4	Receiving (RS2)	M4	Starting code STX(RS2)
D5	Retention	M5	Ending code ETX(RS2)
D6	Retention	M6	Communication protocol
D7	Retention	M7	Retention
D8	Retention	M8	Retention
D9	Timeout flag	M9	Timeout, defined is 10
D10-D19	Retention	M10-M19	Retention

Communication Serial Parameter Settings

Item	Parameters	b15(RS2)	b14-b8	b7	b6	b5	b4	b3	b2	b1	b0
Bit mode	8 bit	0	Retention	-	-	-	-	-	-	-	-
	16 bit	1		-	-	-	-	-	-	-	-
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

VI. Communications protocol

1. Serial communication protocols

Protocol	Value
Modbus RTU slave	02H
Modbus ASCII slave	03H
RS command	10H
Modbus RTU master	20H
Modbus ASCII master	30H

2. Communication Settings

2.1 Communication setting of MODBUS slave

1) CPAVL is a command for communication,



“S” means starting address of “D” registers, “D” means starting address of “M” registers.

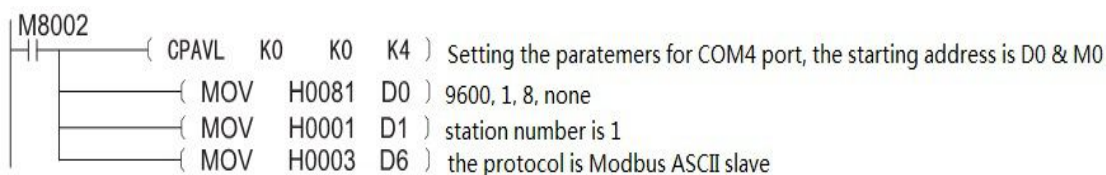
Bit	Content	Word	Content
S+0	Retention	D+0	Communication format, defined is 0
S+1	Sending(RS2)	D+1	Station number, defined is 0
S+2	Sending flag (RS2) Instruction state (MODBUS)	D+2	Remaining amount of data transmission(RS2) Interval of sending(MODBUS)
S+3	Receiving flag(RS2) Communication error flag(MODBUS)	D+3	The number of receiving data(RS2)
S+4	Receiving(RS2)	D+4	Starting code STX(RS2)
S+5	Retention	D+5	Ending code ETX(RS2)
S+6	Retention	D+6	Communication protocol
S+7	Retention	D+7	Retention
S+8	Retention	D+8	Retention
S+9	Timeout flag	D+9	Timeout, defined is 10
S+10-S+19	Retention	D+10-D+19	Retention

2) Setting serial communications parameters;

3) Setting the station number of MODBUS slave;

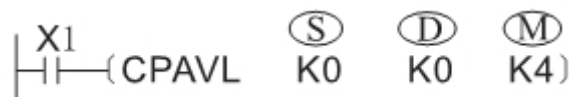
4) Setting Modbus protocol (H03 means Modbus ASCII slave, H02 means Modbus RTU slave)

Example



2.2 Communication setting of MODBUS master

1) CPAVL is a command for communication,



“S” means starting address of “D” registers, “D” means starting address of “M” registers.

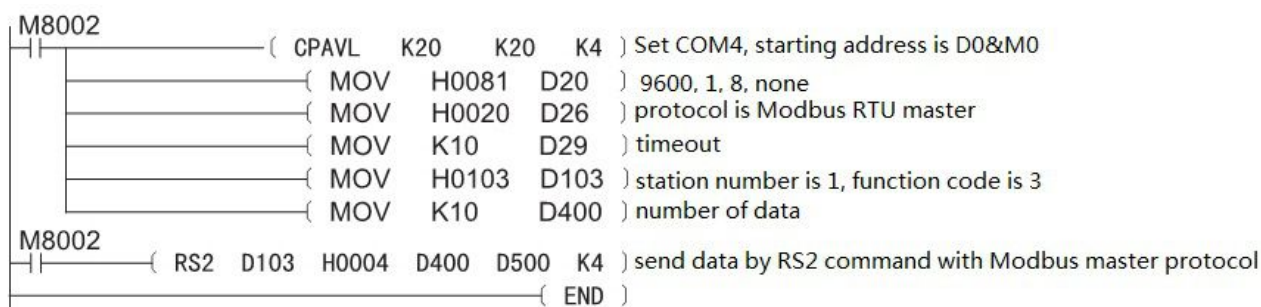
Bit	Content	Word	Content
S+0	Retention	D+0	Communication format, defined is 0
S+1	Sending(RS2)	D+1	Station number, defined is 0
S+2	Sending flag (RS2) Instruction state (MODBUS)	D+2	Remaining amount of data transmission(RS2) Interval of sending(MODBUS)
S+3	Receiving flag(RS2) Communication error flag(MODBUS)	D+3	The number of receiving data(RS2)
S+4	Receiving(RS2)	D+4	Starting code STX(RS2)
S+5	Retention	D+5	Ending code ETX(RS2)
S+6	Retention	D+6	Communication protocol
S+7	Retention	D+7	Retention
S+8	Retention	D+8	Retention
S+9	Timeout flag	D+9	Timeout, defined is 10
S+10-S+19	Retention	D+10-D+19	Retention

2) Setting serial communications parameters;

3) Setting the station number of MODBUS slave;

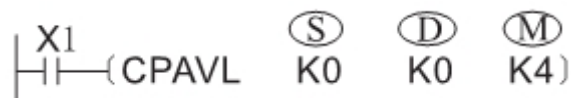
4) Setting Modbus protocol (H03 means Modbus ASCII slave, H02 means Modbus RTU slave)

Example



2.3 communication setting of RS non-protocol

1) CPAVL is a command for communication,



“S” means starting address of “D” registers, “D” means starting address of “M” registers.

Bit	Content	Word	Content
S+0	Retention	D+0	Communication format, defined is 0
S+1	Sending(RS2)	D+1	Station number, defined is 0

S+2	Sending flag (RS2) Instruction state (MODBUS)	D+2	Remaining amount of data transmission(RS2) Interval of sending(MODBUS)
S+3	Receiving flag(RS2) Communication error flag(MODBUS)	D+3	The number of receiving data(RS2)
S+4	Receiving(RS2)	D+4	Starting code STX(RS2)
S+5	Retention	D+5	Ending code ETX(RS2)
S+6	Retention	D+6	Communication protocol
S+7	Retention	D+7	Retention
S+8	Retention	D+8	Retention
S+9	Timeout flag	D+9	Timeout, defined is 10
S+10-S+19	Retention	D+10-D+19	Retention

2) Setting serial communications parameters: bit mode

Example:

H81 means 9600, 1, 8, none, 16 bit

H8081 means 9600, 1, 8, none 8 bit

3) RS protocol setting(H20);

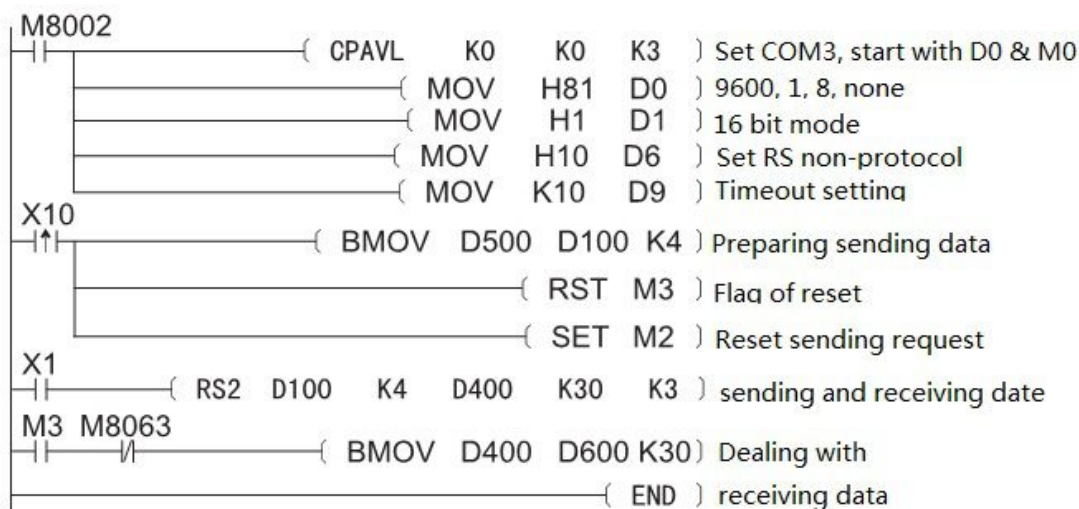
4) Timeout setting;

5) Start and end setting;

6) RS2 command

In the program, there is a need to set up the serial communications, such as setting data starting mode, baud rate, digits, and inspection, etc.

Example:



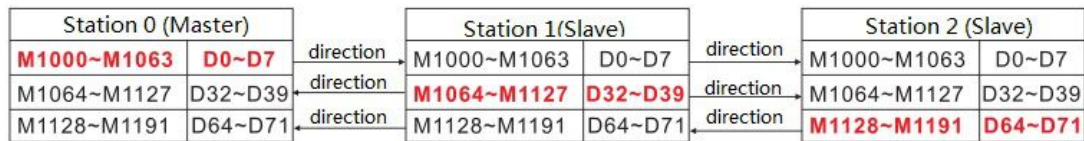
VII N:N network

1. Functional specifications

N:N network function, connecting 8 PLC by RS485 non-protocol, this protocol can be used in COM3, COM4, COM5, COM6, but it requires BD board.

1) There are 5 modes, according connect points.

- 2) It makes 8 PLC together.
- 3) Data transmission is shown in the following figure



2. Connection pattern

Station Number		Mode 0		Mode 1		Mode 2	
		Bit (M)	Word(D)	Bit (M)	Word(D)	Bit (M)	Word(D)
		0	4	32	4	64	8
Master	NO. 0	--	0-3	1000-1031	0-3	1000-1063	0-7
	NO. 1	--	32-35	1064-1095	32-35	1064-1127	32-39
	NO. 2	--	64-67	1128-1159	64-67	1128-1191	64-71
	NO. 3	--	96-99	1192-1223	96-99	1192-1255	96-103
	NO. 4	--	128-131	1256-1287	128-131	1256-1319	128-135
	NO. 5	--	160-163	1320-1351	160-163	1320-1383	160-167
	NO. 6	--	192-195	1384-1415	192-195	1384-1447	192-199
	NO. 7	--	224-227	1448-1479	224-227	1448-1511	224-231
Station Number		Mode 3		Mode 4			
		Bit (M)	Word(D)	Bit (M)	Word(D)		
		64	16	64	32		
Master	NO. 0	1000-1063	0-15	1000-1063	0-31		
	NO. 1	1064-1127	32-47	1064-1127	32-63		
	NO. 2	1128-1191	64-79	1128-1191	64-95		
	NO. 3	1192-1255	96-111	1192-1255	96-127		
	NO. 4	1256-1319	128-143	1256-1319	128-159		
	NO. 5	1320-1383	160-175	1320-1383	160-191		
	NO. 6	1384-1447	192-207	1384-1447	192-223		
	NO. 7	1448-1511	224-239	1448-1511	224-255		

3. N:N network communication parameters

Items	Numbers	Cable	Protocol	Methods	Baud rate
Parameters	8 psc	RS485	N:N net	Half-duplex	38400
Items	Format	Start	End	Sum check	
Parameters	1,7,EVEN	Fixed	Fixed	Fixed	

4. The special devices in N:N network

Device for N:N network communication			
Device	Name	Content	Value
M8179	Chanel	M8179=0, COM3 available	0 or 1

		M8179=1, COM4 available	
D8176	Station No.	0 is for master, 1-7 for slave	0-7
D8177	Quantity of slaves	Set how many slave will be connected to master. (defined value is 7)	1-7
D8178	Refresh range	Select points mode	0-2
D8179	Retry	When communication is fail, try to connect.	0-10
D8180	Timeout	It used to judge the abnormal communication (50ms-2250ms), in 10 ms unit.	
D8201	Current link scan time	Current value of network cycle time	
D8202	Maximum link scan time	Maximum value of network cycle time	
D8203	Error number of master	The number of master's sequence errors	
D8204-D8210	Error number of slave	The number of each slaves' sequence errors.	
D8211	Error code of master	It used to storage error code of master.	
D8212-D8218	Error code of slaves	It used to storage error code of each slaves.	
M8183	Flag of master error	M8183=1, when there is error in master transferring data	
M8184-M8190	Flag of slave error	When slaves have error in transferring data, they will be on.	
M8191	Sending	N:N network is working	
D8063	Error code of communication	It used to save the error code of serial communication. Format: 7xyy, x-serial port No., yy-error code.	
M8063	Flag of communication	M8063=1, when serial communication error.	

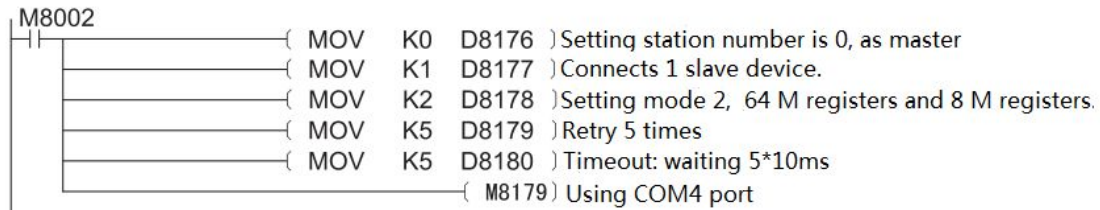
5. Communication setting of N:N network

In N:N network protocol, the only one for the master, the other for the slave. Please view the following content for detailed information.

5.1 Master setting in N:N protocol

- 1) Station number (D8176): it must be 0, if it was 1 means slave.
- 2) Number of slave (D8177): setting range is 1-7.
- 3) Mode (D8178): setting range is 0-2.
- 4) The number of retry (D8179): setting range is 0-10, defined is 3.
- 5) Timeout (D8120): setting range is 0-255(unit: 10ms), defined is 10.
- 6) Serial port number (M8179): 0 means COM3, others mean COM4.

Example:



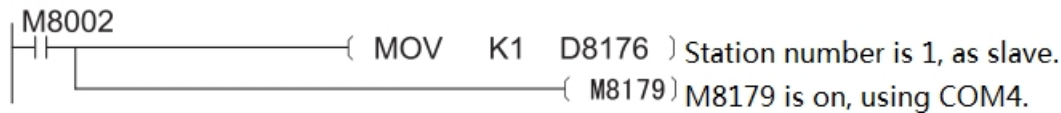
Note:

- 1) Setting master in N:N protocol, the D8176 must be 0, otherwise communication will be fail, and M8063 turn on, D8063 shows 7348 or 7448.
- 2) If there was anything fault in parameters setting, M8063 turn on, D8063 shows 7348 or 7448.

5.2 Slave setting in N:N protocol

- 1) Station number (D8176): Set to non-zero, as slave.
- 2) Serial port number (M8179): 0 means COM3, others mean COM4.

Example:



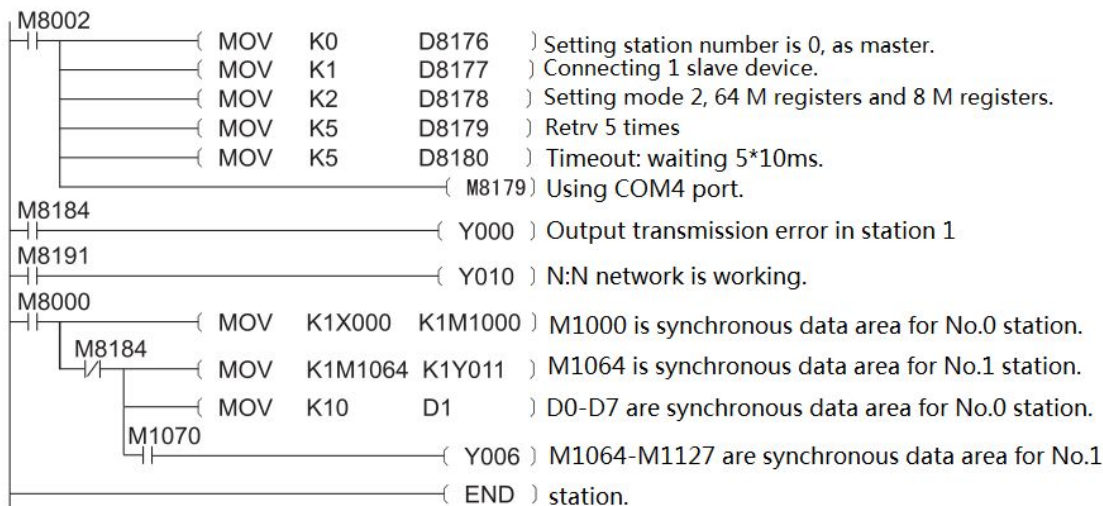
Note:

When setting slave in N:N protocol, D8176 must be non-zero. No other parameters.

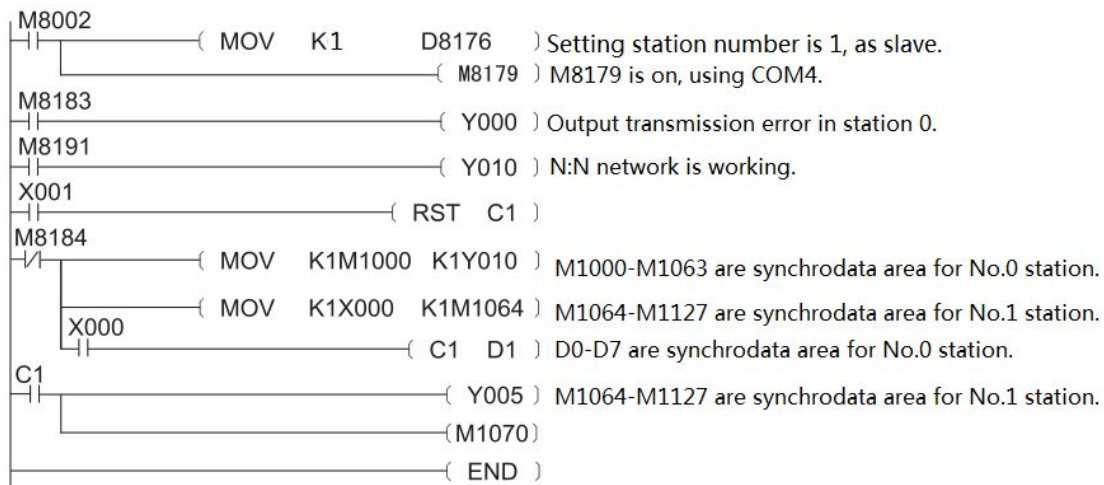
If there was anything wrong in parameters, M8063 turn on, D8063 shows 7348 or 7448.

6. Example of N:N network

6.1 PLC as master



6.2 PLC as slave



VIII. Error codes

If there was anything wrong in communication, M8063 will turn on, and D8063 will display detailed information about error.

Device address	Instructions of showed value	
D8063	COM3	73+Error Code
	COM4	73+Error Code
	COM5	73+Error Code
	COM6	73+Error Code

	Val ue	Error information	Val ue	Expl ain	Val ue	Explain
E R R O R C O D E	0	Error in Modbus slave address.	10	Error in data trans missi on betw een PLC and BD board	40	Error in data transmission between PLC and BD board
	1	Error in length of the data frame.	11		41	
	2	Error in address	12		42	
	3	Error in CRC check.	13		43	
	4	Error in instruction code.	14		44	
	5	Error when receiving.	15		45	
	6	Error in data	16		46	
	7	Error in buffer overflow	17		47	
	8	Error in frame	18		48	
	9	Timeout	19	49	Error in N:N network parameters-BD board	