

# Supplementary Manual for F96 and F112 Series with RS-485 Port

0WRX.466.760

## Connectors of control board:

A) The connectors of control board of F112C3 (93640), F112C1 (93540) are shown as Figure 1:

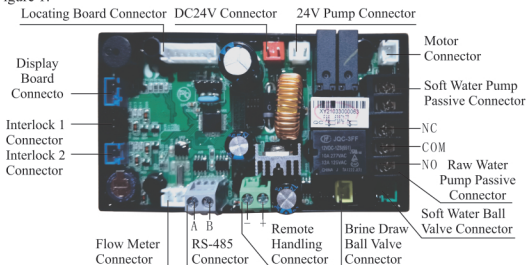


Figure 1

B) The connectors of control board of F96A3 (63650), F96A1 (63550), F96B3 (53650), F96B1 (53550), F112A3 (63640), F112A1 (63540), F112B3 (53640), F112B1 (53540) are shown as Figure 2:

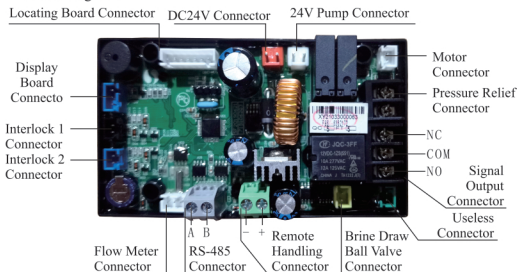


















































Figure 2

## Parameter setting: (take 63650/63640 A-01 control mode for example)

In program display mode, press  and enter program set mode, press  or  to adjust the value.

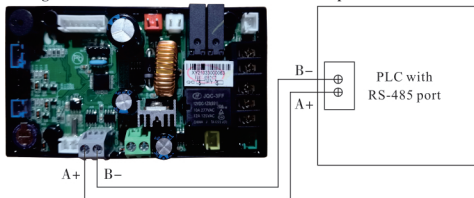
# Parameter setting steps:

Items	Process steps	Symbols
Time of Day	<p>When time of day "12:12" continuously flashes, it reminds to reset. Under unlock status:</p> <ol style="list-style-type: none"> <li>1. Press  to enter into program display mode; both  and  symbol light on, ":" flashes; Press , both  and hour value flash, press  or  to adjust the hour value;</li> <li>2. Press  again, both  and minute value flash, press  or  to adjust the minute value;</li> <li>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</li> </ol>	
Control Mode	<ol style="list-style-type: none"> <li>1. In control mode display status, it displays A-01. Press  and enter into program set mode,  and 01 value flash;</li> <li>2. Press  or , set the value to be A-01 or A-02 control mode;</li> <li>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</li> </ol>	
Regeneration Time	<ol style="list-style-type: none"> <li>1. In regeneration time display status, it displays "02:00". Press  and enter into program set mode.  and 02 flash.</li> <li>2. Press  or  to adjust the hour value;</li> <li>3. Press ,  and 00 flash, press  or  to adjust the minute value;</li> <li>4. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</li> </ol>	
Water Treatment Capacity	<ol style="list-style-type: none"> <li>1. In water treatment capacity display status, it shows  and 400.0. Press  and enter into program set mode.  and 400 flash;</li> <li>2. Press  or  to adjust integral number;</li> <li>3. Press , press  or  to adjust the decimal value;</li> <li>4. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</li> </ol>	
Backwash Time	<ol style="list-style-type: none"> <li>1. In backwash time display status, it shows  and 2-10. Press  and enter into program set mode.  and 10 flash;</li> <li>2. Press  or  to adjust the backwash minute value;</li> <li>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</li> </ol>	
Brine Draw Time	<ol style="list-style-type: none"> <li>1. In brine draw time display status, it shows  and 3-60. Press  and enter into program set mode.  and 60 flash;</li> <li>2. Press  or  to adjust the brine draw minute value;</li> <li>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</li> </ol>	

Slow Rinse Time	<p>1. In slow rinse time display status, it shows  and 4-45. Press  and enter into program set mode.  and 45 flash;</p> <p>2. Press  or  to adjust the slow rinse time minute value;</p> <p>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</p>	
Fast Rinse Time	<p>1. In fast rinse time display status, it shows  and 5-10. Press  and enter into program set mode.  and 10 flash;</p> <p>2. Press  or  to adjust the fast rinse minute value;</p> <p>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</p>	
Brine Refill Time	<p>1. In brine refill time display status, it shows  and 6-05. Press  and enter into program set mode.  and 05 flash;</p> <p>2. Press  or  to adjust the brine refill minute value;</p> <p>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back</p>	
Maximum Interval Regeneration Days	<p>1. In maximum interval regeneration days display status, it shows H-30. Press  and enter into program set mode.  and 30 flash;</p> <p>2. Press  or  to adjust the interval regeneration days;</p> <p>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</p>	
Signal Output Mode	<p>1. In signal output mode display status, it shows b-01. Press  and enter into program set mode.  and 01 flash;</p> <p>2. Press  or  to adjust the mode;</p> <p>3. Press  to finish adjustment, press  to turn back.</p>	
Valve Address	<p>1. In valve address display status, it shows 1. Press  and enter into program set mode.  and 1 flash;</p> <p>2. Press  or  to set the valve address;</p> <p>3. Press  to finish adjustment, press  to turn back.</p>	

## RS-485 Port Introduction:

### •The wiring of a valve connected with PLC with RS-485 port



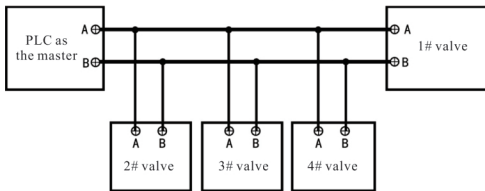
A) Control valve's RS-485 port A and B are respectively connected to PLC's RS-485 port A and B.

B) Use twisted pair wires for connection.

C) In case of far communication distance, a  $120\Omega/4W$  resistor should be connected in parallel to A and B terminals of PLC and valve.

D) Keep away from the high voltage wire when wiring the RS-485 communication wire, and do not bundle the high voltage power wire with RS-485 communication wire together.

### •The wiring of valves connected with PLC with RS-485 port



A) RS-485 port A and B of PLC are respectively connected to RS-485 port A and B of 1# valve. It is as the main wire. Port A and B of 2# and 3# valves are directly connected to A and B main wire in parallel.

B) In case of far communication distance, a  $120\Omega/4W$  resistor should be connected in parallel to RS-485 port A and B of PLC as well as port A and B of 1# valve. There is no required to connect resistor for port A and B of 2#, 3# , 4# and other valves.

C) RS-485 main communication wire can be maximally connected with 32 sets of RS-485 valves or equipments. If connecting more than 32 sets, a 485 repeater should be connected to the main communication wire.

D) As control valve is matched in system, its address range is 1~247 and the default address is 1. Reading or writing data of control valve from PLC should correspond to the number of valve.

● **RS-485 communication protocol**

A) 485 communication protocol: It adopts international MODBUS RTU.

B) Information transmission: Half-duplex mode, in bytes.

C) Transmission speed: fixed 9600bps baud rate.

D) Byte format: 1 start bit, 8 data bits, 1 stop bit, no parity bit.

● **Read one or multiple registers, the function code is 0x03**

A) PLC is the master to read the data of slave valve, the function code is 0x03.

B) The valve MODBUS communication address and corresponding data are defined as follows:

MODBU Address	Instruction	Unit	Data Definition	Comment
0x2002	Remaining Water	Integer m <sup>3</sup>	0~9999	Read remaining water
0x2003	Remaining Water	Decimal 0.1m <sup>3</sup>	0~9	
0x2004	Remaining Time	Day/Minute	0~99	Read remaining time
0x2005	Normal/Fault Status	/	0x0000:Normal 0x0001:E1 0x0002:E2 0x0003:E3 0x0004:E4	Read valve status
0x2006	Current Flow Rate	0.01m <sup>3</sup> /h	0~500	Read current flow rate
0x2009	Regeneration Time	Hour	0~23	Read regeneration time; set hour value
0x200A	Regeneration Time	Minute	0~59	Read regeneration time; set minute value
0x201D	Current Time	Hour	0~23	Read the hour value of current time
0x201E	Current Time	Minute	0~59	Read the minute value of current time

0x2007	Current Status	/	0x0001: Service 0x0002: Settling bed 0x0003: Backwash 0x0004: Brine Draw 0x0005: Soak 0x0006: Slow rinse 0x0007: Fast Rinse 0x0008: Brine Refill 0x0010: Switching	Read the current status of valve
0x200E	Signal Output	/	0x0001:b-01 0x0002:b-02	Read the set signal output

●Write one or multiple registers, the function code for writing one data is 0x06; the function code for writing multiple data is 0x10.

The equipment such as PLC is the master, the valve is the slave, PLC can write the data of slave valve

MODBU Address	Instruction	Unit	Data Definition	Comment
0x3002	Regeneration control mode	/	0x0001: A-01 0x0002: A-02	Set the regeneration control mode of meter type valve
0x3018	Switch working position	/	0~1 One pulse	Force to regenerate

Problem: RS-485 communication doesn't work

**Reasons:**

- A. Wrong connection of RS-485 port wires.
- B. Valve address of PLC is incorrect.

**Solutions:**

- A. Reconnect RS-485 port wires.
- B. Reset the valve address of PLC as the same as that on the valve.