Subject: Rev 1.2 Master Control 20-0386 and Remote.

Details: Master Controller part number 20-0386 is no longer available and replaced by a retrofit kits part numbers B595990001, 0901035, 0901037 based on each model.

Part number: Master Control Panel (20-0386)

Description: Use table below to determine the kits number according to appropriate unit.

1. Master Control Panel (20-0386)

Example of installed on PW 400 and 2000
Results: Created retrofit kits based on each model. See below.

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<th>Commercial</th>
<th>Description</th>
<th>Obsolete Master Controller/Remote</th>
<th>Retro-Kit BOM Number</th>
<th>Legacy Electrical Drawing</th>
<th>Revision</th>
<th>New Retro-Kit Electrical Drawing</th>
<th>Technical Manual</th>
<th>PLD (CSI)</th>
<th>EWI (ENG FOLD)</th>
<th>WI (QSF)</th>
<th>TP (ENG FOLD)</th>
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<td>20 AWG</td>
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NOTES:
1) WIRE IS 22AWG OTHERWISE SPECIFIED.
2) DRAWING IS APPLICABLE TO STW, SPW, AND MPW RETRO-KITS.
3) SEE SHEET 0 TABLE 1.1 FOR WIRE TAG NAME, WIRE COLOR, AND WIRE SOURCE AND DESTINATION TERMINAL BLOCK NUMBER.
4) SEE SHEET 1 FOR STW, SPW, MPW, AND MP RETRO-KITS BOM 1.1 LIST.
5) SEE THE PIN NUMBER ON THE SIDE OF THE LP SWITCH. USE THE NORMALLY OPEN CIRCUIT.
**STW Master Controller Retro-Kit Installation Guide**

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<th>Update By</th>
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**Note:** Some images are from a SPW unit.

**Purpose:** The purpose of this guide is to provide step by step instruction to Retro-fit the Old Master Controller and Water Quality Monitor with new All-In-One Touchscreen Master Controller for STW Legacy Series.


**Warning:** All electrical work shall be performed by a qualified electrician. Not install by a qualified electrician may cause damage to equipment and/or shock to a person.

1. Check to make sure parts are complete per BOM 0901035.
Note: Images shown with remote controller kit. Remote Controller kit is not included with kit 0901035. It is an optional add-on.

Note: Remote Controller kit 0901037 is not included with kit 0901035. It is an optional add-on.

2. Required Tools.
   - Multi-Meter: To measure AC and DC Voltage
3. Identify the Voltage and Phase of unit.

Check Name Plate for System Power and Phase Requirement

4. Remove Old Master and Salinity Monitors
Remove screws from faceplate.

Inside a STW Old Master and Water Quality Monitor Configuration

5. Faceplate Installation. Drill (8) Four on each of the bracket corners 8-32 through holes. Use the bracket as a template. Cut rubber gasket and tape inside the bracket as shown.
Faceplate parts

Cut and tape gasket as shown above
Drill 8 holes (8-32") using the two bracket as shown above

Install screws and nuts to secure brackets to faceplate (Front View)
Install screws and nuts to secure brackets to faceplate (Back View)

Install Touchscreen Master Controller (Front View)
6. Tag the salinity cable and remove it from the Old Master Controller. This same salinity cable will be use on the new Master Controller.

7. Tag each wire and each cable before removal of wires from terminal block 3. Remove all Wires connected to old Master Controller from Terminal 3 as a group.
Tag each wire that are connected from the old Master Controller and Water Quality Monitor to the left side of Terminal Block 3 (TB3). These wires are on the left side of TB3.

Remove the black wire connecting the older Master Controller to the overload.

Remove old Master Controller and Water Quality Monitor and all associated wires and cable from the unit.
8. Tag and identify every electrical component: Product solenoid valve, Auto Freshwater Flash valve, Low Pressure switch, Booster Pump Motor, High Pressure Pump contactor. If unsure, open up the Booster Pump Motor and High Pressure Pump Motor cover and verify high voltage connection.

**Warning:** Not identifying all components and tagging each wire may cause wrong connection. Wrong connection will cause damage to equipment and electric shock to person.

**Solenoid Valve (115VAC or 220VAC).** Check the name plate.

**Low Pressure (Use Normally Open Circuit).** Check the side sticker for NO connection if needed.

**Salinity Probe**
9. Install 2 inch din rail to the inside right side of the enclosure. Drill two 10-32 hole to the side of the enclosure. Use the power supply as a template. Make a 0.3 inch clearance between the top of the power supply and the top of the enclosure.

Make two holes (10-32) for two pan screws that will hold the two inch Din Rail.

Install and secure side Din Rail.

10. Install new Touchscreen Monitor. Tag each wire per Table 1.1 and Reference drawing 13751 for legacy wiring and B595990001 for new Retro-kit wiring.

Warning: Unit has two short neutral wire jumper and two long main neutral wire. Refer to Table 1.1 for full neutral wire jumper connections. Do not contact any dry contact alarm signal to
neutral. Improper neutral connection can cause damage to component and/or electrical shock to a person.

Retro-fit kit prewired (Front View).

Retro-fit kit prewired (Back View).
Pre-Wired and Pre-Labeled PLC Output Wires (220VAC or 110VAC)

Pre-Wired and Pre-Labeled Power Supply Wires (220VAC or 110VAC)
Pre-Wired and Pre-Labeled Low Pressure Switch Wire (24VDC)

Tag and identify all control wires (LPS switch dry contact for 24VDC PLC Input, HP Run signal dry contact, LP Pump motor (115VAC or 220VAC), Solenoid Valve (110VAC or 220VAC).
Install Fork and Ring Terminals To Power Supply Wires

Install Fork and Ring Terminals To Control Wires

Install additional 24VDC Wire for LPS
Connect all prewired and tagged wires to TB3 and TB4 per Retro-kit drawing B595990001.

Verify LPS connection
Four neutral wires.

Install Neutral Wires

Refer to drawing B595990001 section F3. Make sure there’s a neutral wire from TB3-2 to TB4-3.

Warning: Make sure only neutral side of any electrical component is connected to neutral terminal. Connecting other connection beside neutral will cause damage to unit and/or electrical shock to a person.
Identify the Power Wires from PLC

Install 4 of the 5 Wires Into Terminal Block
Install 1 of the 5 Wires, Hot Wire, Into Power Supply Line Side, L

Connect the 5 Wires from the Labeled Salinity Cable to the New Master Controller Board
Mount Power Supply and Fuse block to Din Rail on top right.

Complete Retro-kit Installation.

1. Remote Touchscreen Installation (Optional).

Remote Controller with Cable
Route Remote Controller Cable to Enclosure

Connect Remote Cable Wire to Master Controller Main Canbus Connector
Complete Retro-kit with Optional Remote Controller.

2. Check point to point wire connection after wiring.
3. Check and verify incoming power voltage.
4. Check and verify 24VDC voltage with a voltage meter.
5. Setup and test of RO System with New Master Controller and Remote Controller.

**Caution:** Always take extra precaution when starting up the unit for the first time. Do not touch the unit when it is being power on.

Refer to EWI-0194 Master Controller Touchscreen Add-On Supplement Manual and TP-0279 Master Touchscreen Test Procedure to test and operate the New Master Controller and Remote Interface.
SPW/MPW Master Controller Retro-Kit Installation Guide

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Note: Some images are from a SPW unit.

**Purpose:** The purpose of this guide is to provide step by step instruction to Retro-fit the Old Master Controller and Water Quality Monitor with new All-In-One Touchscreen Master Controller for STW Legacy Series.


**Warning:** All electrical work shall be performed by a qualified electrician. Not install by a qualified electrician may cause damage to equipment and/or shock to a person.

1. Check to make sure parts are complete per BOM 0901035.
Note: Images shown with remote controller kit. Remote Controller kit is not included with kit 0901035. It is an optional add-on.

Note: Remote Controller kit 0901037 is not included with kit 0901035. It is an optional add-on.

2. Required Tools.
   - Multi-Meter: To measure AC and DC Voltage
3. Identify the Voltage and Phase of unit.

4. Remove Old Master and Salinity Monitors
5. Tag the salinity cable and remove it from the Old Master Controller. This same salinity cable will be use on the new Master Controller.
Cut Cable Ties Carefully

Identify and Tag Salinity Cable (5 Conductors Black, White, Green, Black, Plus Shield)
Loosen All 5 Salinity Wires and Leave it hanging.

6. Tag each wire and each cable before removal of wires from terminal block 3. Remove all Wires connected to old Master Controller from Terminal 3.

Remove Master/WQ Monitor Wires Extra
Remove Master/WQ Monitor Wires
Label all wires on the left side from T3-1 to TB-12.

Remove Plate, Old Master Controller, Water Quality Monitor, All associated wires from the unit

7. Tag and identify every electrical component Product solenoid valve (Prod Hot, Prod Neutral), Auto Freshwater Flash valve (Flush Hot, Flush Neutral), Low Pressure switch (LP Com, LP NO), Booster Pump Motor (LP Pump Hot, LP Pump Neutral), High Pressure Pump contactor (HP Pump Hot, HP Pump Neutral). If unsure what the High Voltage is, open up the Booster Pump Motor and High Pressure Pump Motor covers and verify High Voltage connection.

Warning: Not identifying all components and tagging each wire may cause wrong connection. Wrong connection will cause damage to equipment and electric shock to person.
8. Drill 8 Holes (10-32) for mounting two front faceplates. Use the two brackets as templates. Secure the brackets with pan screws and nuts.
9. Install new Touchscreen Monitor. Tag each wire per Table 1.1 on wiring diagram and Reference drawing 13751 and B595990001.

**Warning:** The Unit has two short neutral wire jumper and two long neutral wire. Refer to Table 1.1 on wiring diagram for full neutral wire jumper connections. Not connecting the jumper correctly can cause damage to system and/or electric shock to a person.
Prewired Retro-kit (Back View).

Retro-Kit (Front View).
Pre-Wired and Pre-Labeled PLC Output Wires (220VAC or 110VAC)

Pre-Wired and Pre-Labeled Power Supply Wires (220VAC or 110VAC)
Pre-Wired and Pre-Labeled Low Pressure Switch Wire (24VDC)

Tag and Identify All Control Wires (LPS Switch Dry Contact for 24VDC PLC Input, HP Run Dry Contact, LP Pump Motor (110VAC or 220VAC), Solenoid Valve (110VAC or 220VAC),
Install Fork and Ring Terminals To Power Supply Wires
Install Fork and Ring Terminals To Control Wires
Install additional 24VDC Wire for LPS
Connect 24VDC Wire from Power Supply and LPS Wire from PLC

Verify LPS connection
Install Neutral Wires

Refer to drawing B595990001 section F3. Make sure there’s a neutral wire from TB3-2 to TB4-3.

**Warning:** Make sure only neutral side of any electrical component is connected to neutral terminal. Connecting wrong neutral will cause damage to unit and/or electrical shock to a person.
Identify the Power Wires from PLC

Install 4 of the 5 Wires Into Terminal Block
Install 1 of the 5 Wires, Hot Wire, Into Power Supply Line Side, L

Connect the 5 Wires from the Labeled Salinity Cable to the New Master Controller Board
Install Longer Piece Din Rail

Install Both Power Supply and Fuse Holder
Complete Master Retro-Kit Installation

1. Remote Touchscreen Installation (Optional).

Remote Controller with Cable
Route Remote Controller Cable to Enclosure

Connect Remote Cable Wire to Master Controller Main Canbus Connector
Complete Unit with Retro-kit installation with optional remote controller.

2. Check point to point wire connection after wiring.
3. Check and verify incoming power voltage.
4. Check and verify 24VDC voltage with a voltage meter.
5. Setup and test of RO System with New Master Controller and Remote Controller.

**Caution:** Always take extra precaution when starting up the unit for the first time. Do not touch the unit when it is being power on.

Refer to EWI-0194 Master Controller Touchscreen Add-On Supplement Manual and TP-0297 Test Procedure to test and operate the New Master Controller Interface.
Power Up SPW Unit with Retro-kits.
**PW Master Controller Retro-Kit Installation Guide**

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**Note:** Some images are from a SPW unit.

**Purpose:** The purpose of this guide is to provide step by step instruction to Retro-fit the Old Master Controller and Water Quality Monitor with new All-In-One Touchscreen Master Controller for PW 200-2000 Series.


**Warning:** All electrical work shall be performed by qualified electrician. Not install by a qualified electrician may cause damage to equipment and/or shock to a person.

1. Check to make sure parts are complete per BOM **B595990001**.

Note: Images shown with remote controller kit. Remote Controller kit is not included with kit B595990001. It is an optional add-on.
Note: Remote Controller kit 0901037 is not included with kit B595990001. It is an optional add-on.

2. Required Tools.
   - Multi-Meter: To measure AC and DC Voltage

Tools

Make Labels and Identify Each Wire

Wire Fork and Ring for Connection
3. Identify the Voltage and Phase of unit.

Check Name Plate for System Power and Phase Requirement

4. Remove Old Master and Salinity Monitors

Remove 7 Screws from Front Cover

Inside a SPW Configuration
5. Tag the salinity cable and remove it from the Old Master Controller. This same salinity cable will be use on the new Master Controller.

Cut Cable Ties Carefully

Identify and Tag Salinity Cable (5 Conductors Black, White, Green, Black, Plus Shield)
Loosen All 5 Salinity Wires and Leave it hanging.

6. Tag each wire and each cable before removal of wires from terminal block 3. Remove all Wires connected to old Master Controller from Terminal 3.

Remove Master/WQ Monitor Wires Extra
Remove Master/WQ Monitor Wires
Label All Wires TB1-1 to TB-12

Remove Plate, Old Master Controller, Water Quality Monitor, All associated wires from the unit

7. Tag and identify every electrical component Product solenoid valve, Auto Freshwater Flash valve, Low Pressure switch, Booster Pump Motor, High Pressure Pump contactor. If unsure, open up the Booster Pump Motor and High Pressure Pump Motor cover and verify high voltage connection.

Warning: Not identifying all components and tagging each wire may cause wrong connection. Wrong connection will cause damage to equipment and electric shock to person.
8. Install new Touchscreen Monitor. Tag each wire per Table 1.1 and Reference drawing 13751 and B595990001.

*Warning:* PW Unit has two short neutral wire jumper and two long main neutral wire. Refer to Table 1.1 of drawing number B595990001 for full neutral wire jumper connections.
New Master Controller Kit

New Master Controller and New Face Plate

New Master Controller Kit Back Side
Pre-Wired and Pre-Labeled PLC Output Wires (220VAC or 110VAC)

Pre-Wired and Pre-Labeled Power Supply Wires (220VAC or 110VAC)
Pre-Wired and Pre-Labeled Low Pressure Switch Wire (24VDC)

Tag and Identify All Control Wires (LPS Switch Dry Contact for 24VDC PLC Input, HP Run Dry Contact, LP Pump Motor (110VAC or 220VAC), Solenoid Valve (110VAC or 220VAC),
Install Fork and Ring Terminals To Power Supply Wires

Install Fork and Ring Terminals To Control Wires

Install additional 24VDC Wire for LPS
Connect 24VDC Wire from Power Supply and LPS Wire from PLC

Verify LPS connection
Refer to drawing B595990001 section F3. Make sure there’s a neutral wire from TB3-2 to TB4-3.

**Warning:** Make sure only neutral side of any electrical component is connected to neutral terminal. Connecting other connection beside neutral will cause damage to unit and/or electrical shock to a person.
Identify the Power Wires from PLC

Install 4 of the 5 Wires Into Terminal Block
Install 1 of the 5 Wires, Hot Wire, 
Into Power Supply Line Side, L

Connect the 5 Wires from the Labeled Salinity 
Cable to the New Master Controller Board
Install Longer Piece Din Rail

Install Both Power Supply and Fuse Holder
Complete Master Retro-Kit Installation

1. Remote Touchscreen Installation (Optional).

Remote Controller with Cable
Route Remote Controller Cable to Enclosure

Connect Remote Cable Wire to Master Controller Main Canbus Connector
2. Check point to point wire connection after wiring.
3. Check and verify incoming power voltage.
4. Check and verify 24VDC voltage with a voltage meter.
5. Setup and test of RO System with New Master Controller and Remote Controller.

**Caution:** Always take extra precaution when starting up the unit for the first time. Do not touch the unit when it is being powered on.

Refer to EWI-0194 Master Controller Touchscreen Add-On Supplement Manual and TP-0279 Test Procedure to test and operate the New Master Controller Interface.
MASTER CONTROLLER TOUCHSCREEN EDITION

TECHNICAL MANUAL SUPPLEMENT ADD-ON

Parker Hannifin Corporation
Filtration Group / Village Marine
2630 E. El Presidio Street
Carson, CA 90810

Reverse Osmosis Purification Systems
2000 W. 135th St., Gardena, CA 90249
(800) 421-4503 / (310) 516-9911 Fax: (310) 538-3038

World Wide Web: www.villagemarine.com
## REVISION HISTORY

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<td>6/28/16</td>
<td>Initial release</td>
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MASTER CONTROL CENTER TOUCHSCREEN OPERATIONAL DESCRIPTION

Figure 3.7.2: Touch screen display for Master Control Center and Remote Control Center.

PRODUCT WATER MONITORING SYSTEM

The product water (or permeate) flows past a conductivity sensor which provides a signal to the Master Control Center. Depending on the concentration of total of dissolved solids (TDS) in the permeate, the following occurs:

If the permeate TDS is detected AT GREATER than 500 parts per million (ppm), indicating POOR quality water, a signal is sent from the Master Control Center (Figure 3.7.2), to the three-way product diversion valve (Figure 3.7.3) to reroute the (high salinity) water away from your water storage tank(s) and into the reject stream.

If the permeate TDS has LESS than 500 ppm, indicating GOOD (drinking) water, a signal is sent to the three-way product diversion valve to redirect the good permeate through a flowmeter and finally into your water storage tank(s).
**MASTER CONTROL CENTER**

The Master Control Center (MCC) provides centralized control and monitoring of all important unit functions and operating parameters (Figure 3.7.2). This is achieved through the use of an interactive touch screen monitor.

**REMOTE CONTROL CENTER (OPTIONAL)/(N/A)**

Installed as an option, the Remote Control Center (RCC) provides remote control and monitoring of all important unit functions and operating parameters (Figure 3.7.2) from a remote location. The RCC has a similar configuration as the MCC, but with the following differences outlined in Section 3.7.6

**TOUCH BUTTON AND DISPLAY DESCRIPTIONS**

Refer to the numerical callouts of Figures 3.7.2 for reference of the following touch buttons and displays explanation of the touch screen display.

1. **SALINITY VALUE**
   - Displays the salinity value of the permeate line. Has a range from 0 to 1999 ppm TDS.

2. **TEMPERATURE VALUE**
   - Displays the temperature value of the permeate line. Has a range from 0 to 50 °C.

3. **HOUR METER VALUE**
   - Displays the Hour Meter (or Elapse Time Meter) of the unit.

4. **TEMPERATURE**
   - Allows the operator to change the permeate temperature display between Fahrenheit (°F) or Celsius (°C) by touching the unit of measure.

5. **L PMP** (Low Pressure Pump)
   - Controls the operation (ON/OFF) of the low pressure boost pump. When the L PMP button changes to gold, the low pressure boost pump is running.

6. **H PMP** (High Pressure Pump)
   - Controls the operation (ON/OFF) of the high pressure pump. When the H PMP button changes to gold, the high pressure pump is running.

7. **DUMP/NORM**
   - Allows the operator to bypass the normal automatic operation and manually direct the permeate water. DUMP indicates when the product valve is de-energized and the product valve is directing permeate to the reject line. NORM indicates when the product valve is energized and the product valve is directing permeate to the storage tank. This button can only be pressed when the L PMP is on.

8. **FLUSH**
   - Energizes the flush valve. Activates an internal time that will automatically run the LP and HPMPs for 2 minutes. After the flush, the system will turn off the L PMP and H PMP. The button can only be pressed when the L PMP is off.

9. **MENU**
   - Access the menu screen for more configurations.

10. **OIL CHANGE ICON**
    - The oil change icon will be display when the Hour Meter reaches the 50 for the first oil change, and then every 500 hours after it has been reset.

11. **TIME**
Displays the current time.

(12) **DATE**
Displays the current date.

**OPERATIONS AND FUNCTIONS**

(1) **HIGH SALINITY**
The screen will flash red (Figure 3.7.4) when the permeate salinity goes above the salinity set point of 500 ppm. In addition, the product valve will de-energize and divert the permeate away from the storage tank.

![Figure 3.7.4: Red display screen when the permeate salinity is above the set point value of 500 ppm.](image)

(2) **LOW PRESSURE**
When a low pressure condition is present, the low pressure warning will be display (Figure 3.7.5).

![Figure 3.7.5: Low pressure warning window.](image)

Pressing the **RESET** button will reset the low pressure alarm and re-enable the system, while pressing the **SILENCE ALARM** button will silence an audible alarm that is present.

(3) **OIL CHANGE**
The Master Control Center continuously monitors and records the total operated hours of the high pressure pump and will indicate an OIL (see number 10 in Figure 3.7.2) icon when the pump needs an oil change.

The first oil change required is after the first 50 hours of use on the RO unit and every 500 hours thereafter.

Pressing the OIL icon will bring up the oil change notification window (Figure 3.7.6).

![Figure 3.7.6: Oil change notification window.](image)

Pressing the **RESET** button will reset this counter and remove the OIL icon, while pressing the **BACK** button will return back to the display screen.

**NOTE:** A display of 2000 ppm indicates the salinity of the water exceeds the detectable range for salinity. The Master Control Center has a salinity detection range of 0 ppm to 1999 ppm (0-1999 ppm).

**NOTE:** The automatic display feature is intended to provide general guidance concerning membrane cleaning frequency only. Actual membrane cleaning frequency will vary in response to changes in the seawater conditions. Refer to Section 3.7.4 for specific information regarding how to determine actual cleaning frequencies.
9.1 CONFIGURATION DESCRIPTION

MAIN MENU SCREEN

The main menu screen displays all the essential configurations for the system (Figure 3.7.7).

MCC AND RCC DIFFERENCES

<table>
<thead>
<tr>
<th>Functions</th>
<th>MCC</th>
<th>RCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>L PMP</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>H PMP</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DUMP/NORM</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>FLUSH</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>MENU</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Set Permeate Salinity Offset</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Set Permeate Temperature Offset</td>
<td>X</td>
<td>X*</td>
</tr>
<tr>
<td>High Salinity Audible Alarm Enabler</td>
<td>X</td>
<td>X*</td>
</tr>
<tr>
<td>Low Pressure Audible Alarm Enabler</td>
<td>X</td>
<td>X*</td>
</tr>
<tr>
<td>Silence Alarms</td>
<td>X</td>
<td>X*</td>
</tr>
<tr>
<td>Screensaver Enabler</td>
<td>X</td>
<td>X*</td>
</tr>
<tr>
<td>Screensaver Idle Time</td>
<td>X</td>
<td>X*</td>
</tr>
<tr>
<td>Set Permeate Salinity Set-Point</td>
<td>X</td>
<td>X*</td>
</tr>
<tr>
<td>Set Flush Time</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Schedule Flush Enabler</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Set Schedule Flush</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Table 3.7: Differences between MCC and RCC Table.

* Changes on the RCC are independent and will NOT have an effect on the MCC setting.

**DEFAULT VALUES**

Table 3.7.4 displays the factory default values for each type of configurations. These parameters can be reset back to factory default in the system configuration screen.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brightness</td>
<td>100</td>
</tr>
<tr>
<td>Salinity Offset</td>
<td>0</td>
</tr>
<tr>
<td>Temperature Offset</td>
<td>0</td>
</tr>
<tr>
<td>Salinity Set Point</td>
<td>500</td>
</tr>
<tr>
<td>Flush Time</td>
<td>2</td>
</tr>
<tr>
<td>Flush Schedule Enabler</td>
<td>Disable</td>
</tr>
<tr>
<td>Flush Schedule</td>
<td>None</td>
</tr>
<tr>
<td>Flush Schedule Time</td>
<td>8:00</td>
</tr>
<tr>
<td>Screensaver Enabler</td>
<td>Enable</td>
</tr>
<tr>
<td>Screensaver Time</td>
<td>1</td>
</tr>
<tr>
<td>Hibernate Enabler</td>
<td>Enable</td>
</tr>
<tr>
<td>Hibernate Time</td>
<td>5</td>
</tr>
<tr>
<td>Low Pressure Alarm Enabler</td>
<td>Enable</td>
</tr>
<tr>
<td>Salinity Alarm Enabler</td>
<td>Enable</td>
</tr>
</tbody>
</table>

Table 3.7.4: Default Configuration Table.

**MENU CONFIGURATION DESCRIPTIONS**

Refer to the numerical callouts of Figures 48A for reference of the following configuration items.

(1) **SENSOR CALIBRATION**

The sensor calibration screen displays the configuration menu for the calibrating (offsetting) the permeate salinity and temperature value (Figure 9.8).
Figure 3.7: Calibration configuration screen.

Pressing the **SET SALINITY OFFSET** button will bring up the salinity offset entry screen (Figure 3.7.9). Pressing the **SET TEMPERATURE OFFSET** button will bring up the temperature offset entry screen (Figure 3.7.10). Pressing the **BACK** button will return to the main menu screen.

Figure 3.7.9: Salinity offset entry screen.

Figure 3.7.10: Temperature offset entry screen.

Pressing + and – buttons will define a positive or negative offset, respectively. Pressing the arrow **UP** and **DOWN** buttons will increment and decrement, respectively. The buttons °C and °F shows which unit of measure the offset is changing. Pressing the **BACK** button will cancel any changes, while pressing the **ENTER** button will save any changes.

See Section X.X for steps to calibrate the salinity and temperature values.

**WARNING**

IMPROPER CALIBRATION WILL RESULT IN INACCURATE WATER QUALITY. IF YOU FIND THAT THE CALIBRATION IS ABOVE THE ±100 RANGE, SOMETHING MAY BE WRONG WITH THE PROBE OR THE SYSTEM.

(2) **ALARMS**

The alarms configuration screen displays the audible alarm enabler for the high salinity alarm and the low pressure alarm (Figure 3.7.11).
Pressing the **LOW PRESSURE ALARM ENABLED/DISABLED** button will toggle between enabled (BLACK) and disabled (GRAY) for the low pressure alarm. Pressing the **SALINITY ALARM ENABLED/DISABLED** button will toggle between enabled (BLACK) and disabled (GRAY) for the high salinity alarm. Pressing the **SILENCE ALARM** will silence any audible alarms present.

(3) **SCREENSAVER**
The screensaver configuration screen displays the screensaver enabler and the idle time before the screensaver activates (Figure 3.7.12).

Pressing the **SCREENSAVER ENABLED/DISABLED** button will toggle between enabled (BLACK) and disabled (GRAY) for the screensaver. Pressing the **SET SCREENSAVER TIME** button will bring up the screensaver idle time entry screen (Figure 3.7.13). Pressing the **BACK** button will return to the main menu screen.
Pressing the arrow **UP** and **DOWN** buttons will increment and decrement, respectively. Pressing the **BACK** button will cancel any changes, while pressing the **ENTER** button will save any changes.

(4) **SALINITY**

The salinity configuration screen displays the salinity set-point value that will trigger a high salinity (Figure 3.7.14).

Pressing the **SET SALINITY SET-POINT** button will bring up the salinity set-point entry screen (Figure 3.7.15). Pressing the **BACK** button will return to the main menu screen.
Pressing the arrow **UP** and **DOWN** buttons will increment and decrement, respectively. Pressing the **BACK** button will cancel any changes, while pressing the **ENTER** button will save any changes.

(5) **FLUSH**

The flush configuration screen displays length of time a flush will be enable (Figure 3.7.16).

Pressing the **SET FLUSH TIME** button will bring up the flush time entry screen (Figure 3.7.17). Pressing the **BACK** button will return to the main menu screen.

⚠️ **WARNING**

SETTING THE SALINITY SET-POINT ABOVE 500 IS NOT RECOMMENDED. SET AT YOUR OWN RISK.
Pressing the arrow **UP** and **DOWN** buttons will increment and decrement, respectively. Pressing the **BACK** button will cancel any changes, while pressing the **ENTER** button will save any changes.

(6) **FLUSH SCHEDL**

The flush schedule configuration screen displays the enabler for the flush schedule and the start time of the auto flush (Figure 3.7.18).

Pressing the **SCHEDULE ENABLED/DISABLED** button will toggle between enabled (BLACK) and disabled (GRAY) for the auto flush. Pressing the **FLUSH SCHEDULE** button will bring up the flush schedule entry screen (Figure 3.7.19). Pressing the **START TIME** button will bring up the flush schedule start time entry screen (Figure 3.7.20). Pressing the **BACK** button will return to the main menu screen.
Pressing the day buttons, **SUN, MON, TUES, WED, THUR, FRI** and **SAT** will enable an auto flush scheduled for that day, respectively. Pressing the **BACK** button will cancel any changes, while pressing the **ENTER** button will save any changes.

Pressing the arrow **UP** and **DOWN** buttons will increment and decrement, respectively. Pressing the **BACK** button will cancel any changes, while pressing the **ENTER** button will save any changes.

(7) **HIBERNATE**

The hibernate configuration screen displays the hibernate enabler and the idle time before the hibernate activates (Figure 3.7.21).
Pressing the **HIBERNATE ENABLED/DISABLED** button will toggle between enabled (BLACK) and disabled (GRAY) for hibernation. Pressing the **SET HIBERNATE TIME** button will bring up the hibernate idle time entry screen (Figure 3.7.22). Pressing the **BACK** button will return to the main menu screen.

Pressing the arrow **UP** and **DOWN** buttons will increment and decrement, respectively. Pressing the **BACK** button will cancel any changes, while pressing the **ENTER** button will save any changes.

**SYSTEM**

The system configuration screen displays the button to restore the default configurations in Table 3.7.4, the touch screen's brightness level, and the internal clock (Figure 3.7.23 and Figure 3.7.24).
Pressing the **RESTORE DEFAULT SETTINGS** button will bring up the restore default confirmation window (Figure 3.7.25). Pressing the arrows << and >> buttons will increment and decrement the brightness by 10, respectively. Pressing the arrows < and > buttons will increment and decrement the brightness by 5, respectively. Pressing the **BACK** button on the system configuration screen 1 (Figure 3.7.23) will return to the main menu screen. Pressing the **NEXT** button will navigate to the system configuration screen 2 (Figure 3.7.24).

Pressing the **SET DATE** button will bring up the set system date entry screen (Figure 3.7.26). Pressing the **SET TIME** button will bring up the set system time entry screen (Figure 3.7.27). Pressing the **BACK** button on the system configuration screen 2 (Figure 9.24) will return to the system configuration screen 1 (Figure 3.7.23).

Pressing the **YES** button will restore the default configurations in Table 3.7.4. Pressing the **NO** button will return to the system configuration screen 1 (Figure 3.7.23).
Pressing the arrow **UP** and **DOWN** buttons will increment and decrement, respectively. Pressing the **BACK** button will cancel any changes, while pressing the **ENTER** button will save any changes.

### 3.7.2 CLEANING THE SALINITY PROBE

**Step 1:** Unscrew the salinity probe from the manifold. Refer to Figures 3.7.28 for visible location of the probe.

**Step 2:** Clean the probe with a soft cloth and mild detergent. Continue to clean until the probe prong surfaces (Refer to Figure 3.7.29) are clear and bright. If required, gently scrub with emery paper (or known as wet-sand paper) or warm vinegar to aid in the removal of difficult scale and film deposits. Clean the salinity probe port of the manifold also.
<table>
<thead>
<tr>
<th>TEST OBJECTIVE</th>
<th>Verify the touchscreen Master Control Center’s functions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST CRITERIA</td>
<td>None</td>
</tr>
<tr>
<td>TEST DURATION</td>
<td>As required</td>
</tr>
<tr>
<td>TEST MATERIALS</td>
<td>1. A handheld Conductivity meter.</td>
</tr>
<tr>
<td></td>
<td>2. A Philips and/or Slotted screwdriver.</td>
</tr>
<tr>
<td></td>
<td>3. A 0-100 psig Pressure gauge test assembly.</td>
</tr>
<tr>
<td>TEST PREPARATION</td>
<td>1. Connect all inlet and outlet ports to the system, attaching the pressure gauge test assembly between the feedwater port and the feedwater port of the unit.</td>
</tr>
<tr>
<td></td>
<td>2. Connect the power cable. Check to make sure the unit is on by the following startup screen.</td>
</tr>
</tbody>
</table>

![Startup Screen](image)

3. Touch the startup screen to navigate to the main display show below.

![Display Screen](image)
4. The main display has the following information and functions:
   • Salinity value measured in ppm.
   • Temperature value measured in °C or °F.
   • Temperature display, toggles between °C or °F.
   • Hour Meter that displays the total running hours when the pump is on.
   • Oil Change icon that will display when the Hour Meter reaches 50 for the first time and then every 500 hours thereafter.
   • Current date.
   • Current time.
   • Menu bar on the right with the following buttons:
     • L PMP – Turns on/off the Low Pressure Pump.
     • H PMP – Turns on/off the High Pressure Pump.
     • DUMP/NORM – Turns on/off the product solenoid valve that directs the product line to tank or overboard. DUMP indicates water is dumping overboard and NORM indicates water is in normal condition and going to tank.
     • FLUSH – Puts the system in flush mode and displays a preset flush count down time.
     • MENU – Access the various configurations items.

5. Touch MENU to bring up the MAIN MENU screen shown below, then touch SYSTEM to go into the system configuration screen. In the system configuration screen, touch Restore Default Settings and touch Yes when prompt. This ensures that all configurations are normalized prior to tests.

6. After verifying each steps, mark them down attached checklist in Appendix A.
7. Button color: Silver with White Text = ON, Gray with White Text = OFF, Gray with White Text = DISABLED.

TEST PROCEDURE

**Master Control Center with Remote Controller**

1. Follow Step 1 to 15 of the Master Control Center section, while configuring in the Master Control Center and verifying that the Remote Controller displays the same changes.

2. Repeat Step 1, 2, 4 to 6, and 9 to 16 of the Master Control Center section, while configuring in the Remote Controller and verifying that the Master Control Center displays the same changes. For steps that cannot be configure by the Remote Controller, use the Master Control Center to configure them.

The following functions cannot be set by the Remote Controller and must be performed on the Master Control Center:
- DUMP/NORM operation
- Salinity Offset
- Temperature Offset
- Reset Low Pressure Alarm
- Reset Oil Change

The following functions are independent (does not sync) between the Master Control Center and the Remote Controller:
- High Salinity Alarm
- Low Pressure Alarm
- Screensaver
- Screensaver Time
- Hibernate
- Hibernate Time
- Brightness

**Master Control Center**

1. **L PMP operation verification**

   1.1 Touch the L PMP button.

   1.2 Verify that the L PMP button should changes to silver, the boost pump turns on, and the H PMP is no longer disabled.

   1.3 Touch the L PMP button again.

   1.4 Verify that the L PMP button changes to gray with white text, the boost pump turns off, and the H PMP is disabled.

   1.5 Check off in attached checklist.

   *Note: You may get a Low Pressure fault after 5 second if there is no inlet pressure to the system. Make sure there is pressure by checking the pressure gauge in the gauge test assembly.*

2. **H PMP operation verification**

   2.1 Make sure the L PMP is on.

   2.2 While having L PMP on, touch the H PMP button.

   2.3 Verify that the H PMP button changes to silver and the main pump turns on.

   2.4 Touch the H PMP button.
2.5 Verify that the H PMP button changes to gray with white text and the main pump turns off.

2.6 Check off in attached checklist.

Note: You may get a Low Pressure fault when you touch the H PMP button if there is no inlet pressure to the system. Make sure there is pressure by checking the pressure gauge in the gauge test assembly.

### 3. DUMP/NORM operation verification

3.1 Touch the DUMP button.

3.2 Verify that the button changes to silver, display as NORM, the product solenoid energizes, and water is flowing out of the product port on the unit.

3.3 Touch the NORM button.

3.4 Verify that the button changes to gray with white text, display as DUMP, the product solenoid de-energizes, and no water is flowing out of the product port on the unit.

3.5 Check off in attached checklist.

### 4. FLUSH operation and Flush Time verification

4.1 Verify that the L PMP is off and the system is switched over to Cleaning mode (Cleaning valve is open on the unit).

4.2 Touch the FLUSH button.

4.3 Verify that the Flush Time Remaining window opens up, displaying a count down of the flush time of 2 minutes.

4.4 Touch the STOP button.

4.5 Verify that the L PMP is on.

4.6 Set the flush time to 1 minute. To navigate to the Set Flush Time screen, touch MENU → FLUSH.

4.7 Touch the H PMP to turn it on.

4.8 With L PMP and H PMP on, touch the FLUSH button.

4.9 Verify that the Flush Time Remaining window opens up, displaying a count down of the flush time of 1 minute.

4.10 Touch the STOP button.

4.11 Verify that the L PMP and H PMP are still on.

4.12 Touch the L PMP to turn off the L PMP and disable the H PMP.

4.13 Check off in attached checklist.

### 5. Flush schedule, Date and Time verification

5.1 Verify that the L PMP is off.

5.2 Enable the flush schedule. To navigate to the Flush Schedule screen, touch MENU → FLUSH SCHEDULE.

5.3 Set the flush schedule day to Monday.
5.4 Set the flush schedule time to 8:00.

5.5 Set the Date to a Monday. To navigate to the Set Date screen, touch MENU → SYSTEM → NEXT.

5.6 Set the Time to 7:59. To navigate to the Set Time screen, touch MENU → SYSTEM → NEXT.

5.7 Wait for the time to reach 8:00.

5.8 Verify that the flush window opens and counts down.

5.9 Wait for the flush to finish.

5.10 Verify that the L PMP is off.

5.11 Change the Date and Time back, and switch the system back to Normal mode (Cleaning valve is closed on the unit).

5.12 Check off in attached checklist.

6. **High Salinity and High Salinity Alarm verification**

6.1 Turn on L PMP and H PMP.

6.2 With L PMP and H PMP on, open the bypass valve, until there’s about 80 psig to the system.

6.3 Wait for the salinity reading to drop to normal levels below 500 ppm (Typically after 1 minute or until the reading stabilizes).

6.4 Change the Salinity Set Point value to one that is below the current salinity reading. To navigate to the Set Salinity Set Point screen, touch MENU → SALINITY.

6.5 Verify that the alarm turns on, DUMP is display, and the Display screen should be flashing red.

6.6 Silence the alarm. To Navigate to the Alarms configuration screen, touch MENU → ALARMS.

6.7 Disable the Salinity Alarm.

6.8 Go back to the Salinity Set Point configuration screen and change the value back to 500.

6.9 Exit back to the Display screen and verify that NORM is display, and the Display screen no longer flashes red.

6.10 Go back to the Salinity Set Point configuration screen and change the value back to one that is below the current salinity reading.

6.11 Verify that the DUMP should be display, and the flashing should stop, but the alarm stays off.

6.12 Go back to the Salinity Set Point configuration screen and change the value back to 500.

6.13 Turn off L PMP and close the bypass valve.

6.14 Check off in attached checklist.

7. **Salinity calibration verification**

7.1 Use the portable conductive meter and test the product water for the product port.

7.2 Calibrate the salinity reading as necessary to reflect this value. To navigate to the Salinity Calibration screen, touch MENU → SENSOR CALIBRATION → SALINITY OFFSET.
7.3 Verify that the reading is displayed correctly.

7.4 Check off in attached checklist.

8. **Temperature calibration verification**

8.1 Use the portable conductive meter and test the product water.

8.2 Calibrate the temperature reading as necessary to reflect this value. To navigate to the Temperature Calibration screen, touch MENU → SENSOR CALIBRATION → TEMPERATURE OFFSET.

8.3 Verify that the reading is displayed correctly.

8.4 Check off in attached checklist.

9. **Temperature verification**

9.1 Verify that touching the temperature unit changes between °C and °F.

10. **Low Pressure and Low Pressure Alarm verification**

10.1 Turn on L PMP and H PMP.

10.2 Open the bypass valve until the pressure is 80 psig.

10.3 Slowly close the inlet valve, until the pressure reads 0 psig or below.

10.4 Verify that the Low Pressure windows opens, alarm turns on, and both pumps turn off.

10.5 Touch SILENCE ALARM.

10.6 Touch RESET.

10.7 Disable the Low Pressure Alarm. To Navigate to the Alarms configuration screen, touch MENU → ALARMS.

10.8 Open up the inlet valve.

10.9 Touch L PMP.

10.10 Slowly close the inlet valve, until the pressure reads 0 psig or below.

10.11 Verify that the Low Pressure windows opens after 5 second of 0 psig or below, the low pressure pump turns off, and the alarm stays off.

10.12 Open up the inlet valve, and close the bypass valve.

10.13 Check off in attached checklist.

11. **Screensaver verification**

11.1 Set screensaver time to 1 minute. To navigate to the Screensaver configuration screen, touch MENU → SCREENSAVER.

11.2 Wait 1 minutes, and verify that the screensaver comes on.

11.3 Touch the screen to bring back the Display screen.
11.4 Disable the screensaver.

11.5 Wait 1 minutes, and verify that the screensaver does not turn on.

11.6 Check off in attached checklist.

12. Hibernate verification

12.1 Set hibernate time to 1 minute. To navigate to the Hibernate configuration screen, touch MENU → HIBERNATE.

12.2 Wait 1 minutes, and verify that the screen turns black.

12.3 Touch the screen to bring the screen back online.

12.4 Disable hibernate.

12.5 Wait 1 minutes, and verify that the screen doesn’t turn black.

12.6 Check off in attached checklist.

13. Brightness verification

13.1 Adjust the brightness down to 50. To navigate to the System configuration screen, touch MENU → SYSTEM.

13.2 Power cycle the system (Power off and then power back on).

13.3 Touch the Startup screen to navigate to the Display screen.

13.4 Navigate to the System configuration and verify that the Brightness is 50.

13.5 Check off in attached checklist.

14. System default verification

14.1 Restore the Default Settings. To navigate to the System configuration screen, touch MENU → SYSTEM.

14.2 Verify the following configurations:

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brightness</td>
<td>100</td>
</tr>
<tr>
<td>Salinity Offset</td>
<td>0</td>
</tr>
<tr>
<td>Temperature Offset</td>
<td>0</td>
</tr>
<tr>
<td>Salinity Set Point</td>
<td>500</td>
</tr>
<tr>
<td>Flush Time</td>
<td>2</td>
</tr>
<tr>
<td>Flush Schedule Enabler</td>
<td>Disable</td>
</tr>
<tr>
<td>Flush Schedule</td>
<td>None</td>
</tr>
<tr>
<td>Flush Schedule Time</td>
<td>8:00</td>
</tr>
<tr>
<td>Screensaver Enabler</td>
<td>Enable</td>
</tr>
<tr>
<td>Screensaver Time</td>
<td>1</td>
</tr>
<tr>
<td>Hibernate Enabler</td>
<td>Enable</td>
</tr>
<tr>
<td>Hibernate Time</td>
<td>5</td>
</tr>
<tr>
<td>Low Pressure Alarm Enabler</td>
<td>Enable</td>
</tr>
<tr>
<td>Salinity Alarm Enabler</td>
<td>Enable</td>
</tr>
</tbody>
</table>

15. Hour Meter verification
15.1 Turn on the L PMP and H PMP.

15.2 Record time return in an hour.

15.3 Verify that the Hour meter increments by 1 in an hour.

15.4 Touch the L PMP to turn off the L PMP and disable the H PMP button.

15.5 Check off in attached checklist.

16 Oil Change (As required)

16.1 Turn on the L PMP and H PMP.

16.2 Leave on to accumulate more than 50 hours on the Hour Meter.

16.3 Verify that an oil change icon is present.

16.4 Touch the oil change icon to bring up the oil change window.

16.5 Touch RESET.

16.6 Touch the L PMP to turn off the L PMP and disable the H PMP button.

16.7 Check off in attached checklist.
APPENDIX

### Master Control Center Checklist

<table>
<thead>
<tr>
<th>Step Ref.</th>
<th>Feature</th>
<th>Function</th>
<th>Confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L PMP</td>
<td>Controls power to the boost pump.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>H PMP</td>
<td>Controls power to the high pressure pump.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>DUMP/NORM</td>
<td>Controls the product solenoid valve.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>FLUSH</td>
<td>Enable flush mode.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Flush Time</td>
<td>Controls how long the system should flush.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Flush Schedule</td>
<td>Set a time and day of the week for an auto flush routine.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Date</td>
<td>Set the Date.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Time</td>
<td>Set the Time.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>High Salinity</td>
<td>Set the unit to dump when the water’s salinity is above the set point.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>High Salinity Alarm</td>
<td>Audible alarm notification when the set point triggers.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Salinity Calibration</td>
<td>Set a salinity offset.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Temp. Calibration</td>
<td>Set a temperature offset.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Temperature</td>
<td>Toggle temperature units between °C and °F.</td>
<td></td>
</tr>
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<td>Low Pressure</td>
<td>Warns operator when a low inlet pressure is present.</td>
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<td>Configures a screensaver.</td>
<td></td>
</tr>
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<td>Screensaver Time</td>
<td>Set a wait time before the screensaver turns on.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Hibernate</td>
<td>Configures screen hibernation to save power.</td>
<td></td>
</tr>
<tr>
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<td>Hibernate Time</td>
<td>Set a wait time before the screen goes into hibernate.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Brightness</td>
<td>Adjust the screen’s brightness.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>System Default</td>
<td>Restores values to their default value according to table in step 13.2.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Hour Meter</td>
<td>Increment every 1 hour when the high pressure pump is on.</td>
<td></td>
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<tr>
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<td>Comes on at 50 hour of the runtime by the high pressure pump.</td>
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