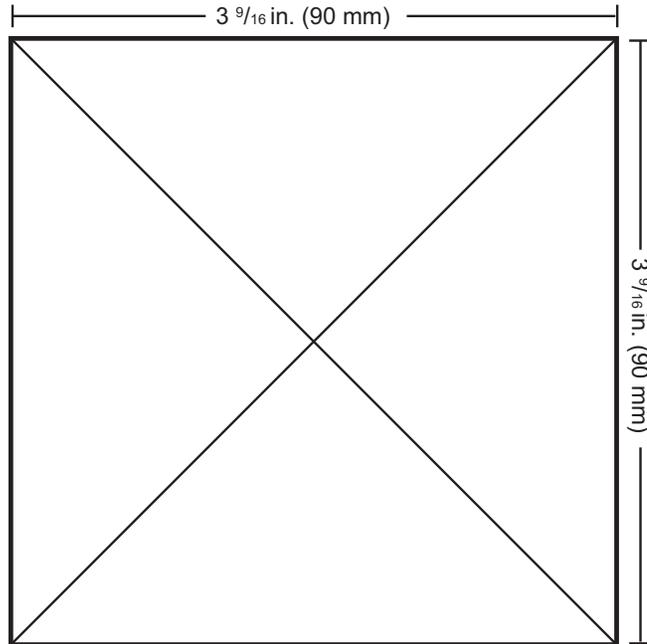


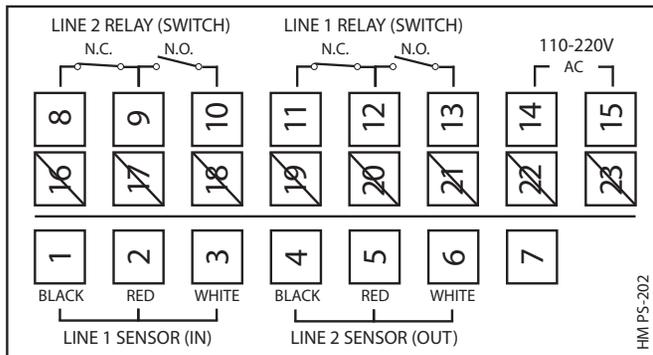
PANEL CUT-OUT DIAGRAM



1. Using a knife, cut the diagram out (cut on the outer part of the line).
2. Align the cut-out to your panel and draw cut marks.
3. Cut the hole in the panel to the precise dimensions of the cut-out:  
3-9/16 in. x 3-9/16 in. (90 mm x 90 mm)

-> See the installation section for complete instructions.

CONTACT DIAGRAM



**USER'S GUIDE**



**PS-202  
PANEL MOUNT DUAL DISPLAY  
TDS CONTROLLER**



Thank you for purchasing HM Digital's PS-202. The PS-202 is a dual display panel mount total dissolved solids (TDS) controller that monitors and controls levels of TDS in water. The controller has two independent maximum set point to help maintain a limit of TDS allowed in two water lines, such as the product water and the feed water. If the TDS level rises to either set point, the controller will activate a warning light, sound an alarm (optional) and switch the dry contact position from the normal position (to operate a valve, pump, etc.). Once the TDS level drops below the set point, this will deactivate the light and alarm and switch the contacts back to the normal position (normally open or closed).

### **CONTACT INFO**

If you have any problems or questions regarding your controller, please contact HM Digital, Inc.

HM Digital, Inc.  
5819 Uplander Way  
Culver City, CA 90230  
U.S.A

info@hmdigital.com  
www.tdsmeter.com  
1-800-383-2777

### **BOX CONTENTS**

- |                       |                             |                      |
|-----------------------|-----------------------------|----------------------|
| 1. Controller         | 3. Two sensor cables (grey) | 5. Mounting brackets |
| 2. Two sensors (SP-1) | 4. Power cord (black)       | 6. U.S. plug adapter |

### **SPECIFICATIONS**

**TDS Range:** 0 - 999 ppm (mg/L)

**Resolution:** 1 ppm

**Accuracy:** ±2% (of the reading)

**Temperature Compensation:** Automatic (ATC) (1-60°C)

**Calibration:** Manual by trimmer pot calibration screw

**Set-Point:** Single point, controlled by on-screen up/down buttons (to any point within the range)

**Set-Point Relay:** dual, isolated, 2A, Max. 220V, resistive load 100,000 strokes

**Relay Control:** The unit will open or close a circuit via dry contacts when the ppm level of either sensor reaches or exceeds the control setting (simple switch). It can be used to control a pump, solenoid valve or other device. Each relay control is independent.

**Relay Voltage:** 5V (the connected device needs its own power source)

**Alarm:** Optional steady beep (set by user), one for each set point.

**Probe:** ½" NPTF bushing

**Cable Length:** 3 meter (9.8 ft) shielded cable

**Display:** Bright tri-color L.E.D.

**Power Supply:** 110V/230V, ±10% Vac; 50/60Hz

**Enclosure:** Front and back with ABS

**Environment:** -10 to 50°C (4 to 122°F); RH max 95% non-condensing

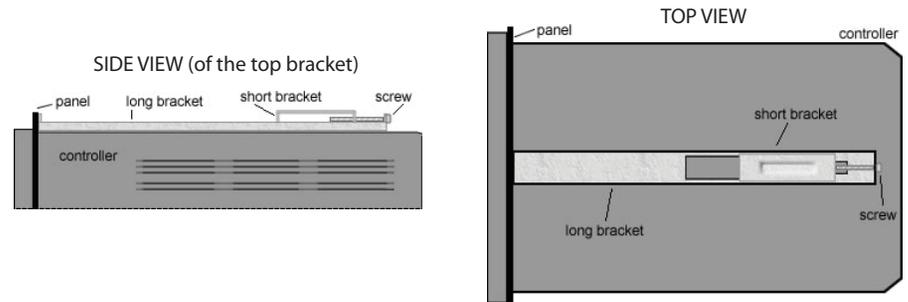
**Dimensions:** 7.2 x 7.2 x 10.2 cm (2.8 x 2.8 x 4 in.)

**Monitor Weight:** 476 grams (1 lb 0.8 oz)

THIS SPACE INTENTIONALLY LEFT BLANK

### **ATTACHING THE MOUNTING BRACKETS**

1. Slide the controller through the hole in the panel.
2. From the rear of the controller, place one long bracket with the ridge side facing up, on the top of the controller.
3. Place a short bracket, with the legs facing down, through the holes in the long bracket, and into the holes in the controller. The hooked leg should be closer to the controller face.
4. Slide the long bracket towards the controller face, so that the front end is pressed against the panel.
5. Secure a screw from the hole in the long bracket through the hole in the short bracket. Tighten, but do not overtighten.
6. Do the same for the bracket on the bottom of the controller. Tighten both brackets equally.



## WARRANTY

### ONE YEAR LIMITED WARRANTY

The PS-202, including the controller and both sensors, is warranted by HM Digital, Inc. ("the Company") to the purchaser against defective materials and workmanship for one (1) year from the date of purchase.

**What is covered:** Repair parts and labor, or replacement at the Company's option. Transportation charges for repaired or new product to be returned to the purchaser.

**What is not covered:** Transportation charges for the defective product to be sent to the Company. Any consequential damages, incidental damages, or incidental expenses, including damages to property. This includes damages from abuse or improper maintenance such as tampering, wear and tear, water damage, or any other physical damage. The Company's products are not waterproof and should not be fully submerged in water. Products with any evidence of such damage will not be repaired or replaced. See additional note below.

**How to obtain warranty performance:** Include with the product your name, address, description of the problem, phone number, and proof of date of purchase, package and return to:

HM Digital, Inc.  
ATTN: Returns  
5819 Uplander Way  
Culver City, CA 90230  
U.S.A.

**Implied Warranties:** Any implied warranties, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to five years from date of purchase. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. To the extent any provision of this warranty is prohibited by federal and state law and cannot be preempted, it shall not be applicable. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

**NOTE:** Warranties are product-specific. Third-party products and products deemed by HM Digital as "accessories" are not covered under warranty. Third-party products and accessories include, but are not limited to, batteries, fuses, mounting brackets, plug adaptors and fittings.

## INSTALLATION INSTRUCTIONS

**IMPORTANT: Double-check your contacts prior to connecting the controller to a power source. Incorrect connections could result in shorting out the unit.**

1. Remove the contents from the box.
2. Insert the controller into the panel. A square hole must be cut into the panel with dimensions of 3-9/16 in. x 3-9/16 in. (90 mm x 90 mm). Page 8 includes a cut-out diagram.
3. Mount the controller to the panel by inserting the mounting brackets into the grooves on the bottom and top of the controller. See page 7 for mounting instructions.
4. View the contact diagram on the side of the controller (also on page 8).
5. Do NOT connect to a power source yet! Connect the black power cord to the contacts #14 & #15 (110 V - 220V). It does not matter which color wire is connected to the contacts. Screw in tight with a Phillips head screwdriver. (Note – If in the U.S. (or a country that uses Type A or B plugs/sockets), connect the included plug adapter to the power cord).
6. If using a pump, valve, etc., for Line 1 (feed water), connect a relay wire (not included) to contacts #12 and #13 for a normally open (N.O.) position OR to contacts #11 and #12 for a normally closed (N.C.) position.
7. If using a pump, valve, etc. for Line 2 (product water), connect a relay wire (not included) to contacts #9 and #10 for a normally open (N.O.) position OR to contacts #8 and #9 for a normally closed (N.C.) position.
8. Connect a gray sensor cable by attaching the black wire to contact #1, the red to #2, and the white to #3. Do not connect the sensors to the sensor cables yet.
9. Connect the second sensor cable by attaching the black wire to contact #4, the red to #5, and the white to #6. The cables are identical and can be swapped.
10. Align the pins of each sensor to each cable and attach. Screw the tightening ring closed. The sensors are identical and can be swapped. Note which sensor is now the Line 1 sensor (feed water) and which is the Line 2 sensor (product water).
11. Insert each sensor electrode into a female ½" NPTF threaded fitting.
12. Attach the fitting connected to the Line 1 sensor to the feed water tube, hose or tank.
13. Attach the fitting connected to the Line 2 sensor to the product water tube, hose or tank.
14. Ensure the orientation of the sensor is perpendicular to the flow of the water. Water should flow equally over both pins. (If using a T, if you look through the top of the T, you should see both pins equally side-by-side. If using the sensor in a tank, ensure that there are no air bubbles trapped between the pins or in a fitting.)
15. To DISABLE the audible alarm, on the front panel of the controller, slide dipswitch #1 to the bottom position to disable the alarm for Line 1, and slide dipswitch #2 to the bottom position to disable the alarm for Line 2.
16. Plug the power cord into an electrical outlet. The controller does not have a power switch and will automatically power on when the power is connected.

## USAGE INSTRUCTIONS

1. The controller will turn on when the power cord is plugged into an electrical outlet.
2. The TDS levels for Line 1 and Line 2 will display continuously on the screen.
3. To turn off the controller, unplug it from the electrical outlet.

## **USAGE INSTRUCTIONS (continued)**

### **Setting the Control Set Point**

1. To set the control set points (to activate the alarm or a device via the relay), press the SET button once. The TDS reading for Line 1 will switch to a flashing number (the current set point). The factory default is 150 ppm for both lines.
2. Press the UP or DOWN buttons until the desired set point is reached. Pressing once will advance the reading by a single digit. Press and hold the button to advance the reading quickly.
3. Press the SET button again. This will save the Line 1 set point to memory and advance to Line 2.
4. Press the UP or DOWN buttons until the desired set point is reached for Line 2. Press the set button again. This will save the Line 2 set point to memory.
5. If the TDS level for either line reaches the saved set point for that particular line, the controller will switch the contacts from the normal position (either normally open or normally closed), thereby operating the pump, solenoid valve, or other device attached to the contacts. The set points are independent of each other. For example, if the set point for Line 1 (feed water) is 400 ppm and the set point for Line 2 (product water) is 50 ppm, the feed water must exceed 400 ppm for set point 1 to activate, and the product water must exceed 50 ppm for set point 2 to activate.
6. Once the TDS level falls below the set point, the contacts will switch back to the normal position for the corresponding water line.
7. The alarm (if not disabled) will sound continuously while the TDS level is over the set point. The only way to turn the alarm off is by lowering the TDS level below the set point or disabling it.
8. The set points are saved to memory even if the power is disrupted. If power is disconnected to the controller, you will not need to re-enter the set points.

### **Calibration**

Your controller was factory calibrated to 342 ppm (NaCl). This level is suitable for most tap water/filtered water applications, so it is ready to use out of the box. However, you may need to re-calibrate based on your needs, as well as from time-to-time to ensure best results.

To calibrate:

1. Obtain a certified calibration solution that is correct for your needs. The calibration solution should be NaCl. HM Digital's 342 ppm NaCl is recommended.
2. Calibrate to the Line 1 (IN) sensor. This will calibrate both sensors simultaneously.
3. Check the controller against the calibration solution. Prior to inserting the sensor into the calibration solution, be sure the sensor is dry and free of any TDS residue. If the reading on the controller does not match the calibration value, you will need to re-calibrate. If using a fitting, calibrate with the fitting on the sensor. (See step 5 for additional information regarding the calibration value.)
4. For better accuracy, calibrate to a flowing solution. If this is not possible, you can calibrate to a still solution. Ensure the fitting is completely filled with solution and there are no air bubbles. This step is critical for proper calibration.
5. If the reading on the controller does not match the solution, adjust the reading up or down by gently turning the trimmer pot calibration screw on the face of the unit (marked as "CALIBRATE") clockwise or counterclockwise to raise or lower the reading.
6. If calibrating to a still (not flowing) solution, calibrate to 3% above the level of the calibration solution. This will accommodate for the lack of flowing water, which the controller is programmed for. For example, if the calibration solution is 342 ppm, adjust the screw until it reads 352 ppm. If you are calibrating to a flowing solution, calibrate to the level of the solution.
7. Gently release the screwdriver from the trimmer pot.
8. Your controller is now calibrated. There is no need to do anything else.

## **TROUBLESHOOTING**

<b>Problem</b>	<b>Potential Solution(s)</b>
The controller will not power on.	1. Check to ensure the connections are correct (double-check 110V vs. 220V). 2. Check to ensure the power cable is plugged in.
Incorrect readings.	1. Try to recalibrate the controller. Note that the calibration should be done with a fitting on (if using a fitting). 2. Check for interference caused by other machinery or electronics (near the controller or cables).
The relay control does not work.	1. Double-check the connections for contacts. 2. Make sure that the set point is properly set for each line.
The display shows "Err".	1. The TDS level of the water is out of the controller's range. 2. The sensor(s) is not connected. 3. The sensor(s) is dirty or damaged.
The display shows the feed water TDS level, instead of the product.	1. The sensors are reversed. Connect the sensor for the feed water to Line 1 sensor contacts, and the sensor for the product water to the Line 2 sensor contacts.

If troubleshooting does not solve the problem, please contact HM Digital for assistance. If your controller is still under warranty, please return the controller to HM Digital for repair or replacement (see page 6).

### **Cleaning**

To clean the sensor electrodes, use rubbing alcohol and a cotton swab. Lightly clean the electrodes. Rinse with DI, RO or distilled water. Air dry.

### **Sensor Replacement**

If your sensor has been damaged, you can purchase a new one (model SP-1) without the need to purchase a new controller.

Contact your authorized HM Digital distributor for a replacement sensor. If you cannot locate an HM Digital distributor, contact HM Digital at [info@hmdigital.com](mailto:info@hmdigital.com)