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DC4000/DC4500 Conductivity Controller Troubleshooting

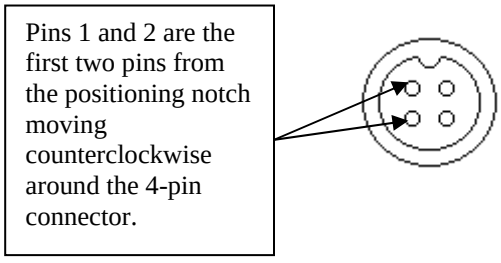
These troubleshooting instructions can be used to help determine functional problems with the DC4000 or DC4500 conductivity controller. Please follow each step carefully to narrow down any possible problems using several of these testing procedures. **Be sure to write down all settings before this procedure is done.**

1. Verify the current software revision being used for the controller (DC4000 Rev. 1.13, DC4500 Rev. 1.53). If earlier version of software **STOP!** Get latest revision and troubleshoot from there.

2. Scroll down to "Advanced Menu" to access "Load Defaults". Reload factory defaults to clear all previous programming parameters. **Any programming that has been entered in the controller will need to be re-entered after all tests are performed.** (This will return the controller settings to a "ground zero" where we can determine that all programming has been cleared.) Enter the **Manual Output** mode and test all outputs to verify correct operation and that no relays on the I/O Board are faulty.

3. Remove the lower cover from the controller to access the I/O Board. In the upper right hand corner you will locate an internal test switch, (the test switch for the DC4000 will be found in the center of the I/O Board). Flip the test switch to the down position, this will enter the test mode. In the test mode, the test switch will by-pass the probe input and put a resistor across the conductivity input and simulate a conductivity reading of 3000 microseimens. Press "Enter" on the keypad to access the "Calibration" mode and use the Up/Down arrows to change the reading to 3000. (Remember: The value that is being displayed may not be at 3000. This controller may have been calibrated to the probe or system water for this application.) After scrolling the value to 3000, press the "Enter" key to hold the value then flip the test switch back to the up or Run position. Wait for 20 – 30 seconds for the programming change to be held in non-volatile memory then put the test switch back into test mode. The conductivity value that is being displayed should stable be at 3000 +/- 10 uS. This will confirm that the controller can hold calibration and continue to next test. If the value displayed is not what it was left at, follow instructions one more time from beginning as a second verification. If after second test and unit does not hold calibration, a replacement CPU or Front Panel will be needed. Contact your local distributor for part number, pricing or warranty information.

4. Using a paper clip, short out pins 1 and 2 of the 4-pin connector for the probe input. This will simulate a full scale reading on the controller of 20,000 uS. If this test works correctly, then you can determine that the controller is working fine and any problems that you may be having are located outside the controller, (i.e.- The cause of the problem lies in the probe or in the system and not in the controller itself).



5. Connect the 4-pin cable of the probe back to the controller unit. Remove the probe from the installation 'T' and use the paper clip to test continuity across the two pins of the probe. Touch one end of the paper clip to each pin on the probe being cautious to not scratch the pins. This should give a full-scale reading as well. It may be anywhere between 15,000 and 20,000 uS. If the reading you get is not between this range, use Emory Cloth or a mild abrasive, such as Soft Scrub to clean the end of the probe. If looking at the bottom of the probe, you will see two pins. If looking at a clock and the pins were located at 9 and 3 o'clock, you should scrub in the direction of 6 and 12 o'clock. This will prevent the possibility of scoring a line in the pin that could result in an electrode jumping from one pin to the other resulting in a false conductivity reading.

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If the probe checks out to respond properly to these tests, the cause is one of the following problems. Electrical interference from an electrical source near the probe or probe cable.

- Electrical interference with the probe signal. Is the probe cable run in any conduit with any other higher voltages?
- Is the probe cable near another high electrical source, (i.e.- near a large motor or power source, maybe on the other side of the wall where the probe cable is run)?
- Is the probe cable shielded or a twisted pair cable? (Probe cables and other low voltage signals should be run in 22AWG shielded or twisted pair cable. If a shielded wire is used, only one end of the shield should be connected to a grounding source. If both ends are connected, it will act as a giant antenna and, like a magnet, draw in any electrical interference. Signal wires can be run perpendicular to a higher voltage but never in parallel with them and code in most states require different conduit be used for high and low voltage signals. Check with local regulations for your area.)
- Is there a ground loop in the system? If so, the source of the ground loop will need to be located and repaired. This can cause erroneous conductivity readings. A ground loop can be caused by a voltage leak or faulty wiring of a motor that is grounded to an Earth Ground connected to the piping system. That voltage can then travel through the system using the water as its means of continuity. This can effect conductivity readings and possibly probe life.
- Is air trapped in the system? Air can cause the conductivity reading to jump all over the place. Verify that the loop is clear of any possible air bubbles.