Troubleshooting Guide

422 Universal Reset Module

Screen Is Blank

- The 422 gets power from the 24VAC plug on the back. Check that the zone/power manager beside the 422 is getting power
- If the zone/power manger is receiving voltage use meter to check that the plug has 24VAC. To do this you may have to strip a piece of thermostat wire and insert it into the pins so your meter probes can connect. Be careful not to touch wires together to short out the 24VAC. If the zone/power manager is not sending the voltage replace the zone/power manager

Check Sensors

- Start by going through the view menu and ask the question, am I getting accurate numbers back?
- If you're in the middle of a New England blizzard and the outdoor sensor says it's 90°F outside, is this reasonable?
- If you see bad numbers it's time to grab an ohm meter and start measuring. Refer to the sensor manual or 'Sensor Troubleshooting Guide' and follow testing instructions

Other Sensor Issues

- Another source of sensor error is placement or wiring to wrong terminals. Examples include mixing supply sensors wired to the Boiler supply terminals, outdoor sensors placed in the sun or right beside boiler exhaust vents. Sensors must be placed where they get accurate temperatures for the designated input to the 422

Outdoor Sensor Notes

- The 422 requires an outdoor sensor so that outdoor reset can do the math properly and follow WWSD for the heating calls
- DHW and setpoint calls are not affected by WWSD
- If you need to bypass WWSD to get heat see notes below on bypassing outdoor sensor
- In cases where it's not practical to use a wired outdoor sensor consider the 087 wireless outdoor sensor

Bypassing Outdoor Sensor

- Common reasons for bypassing the outdoor sensor include turning on the heat in the summer to test equipment or the outdoor sensor is reading high and putting the unit in WWSD in the winter
- You can check the current outdoor sensor reading and adjust the WWSD above it. Make sure you write down what the setting was before you change it so it can be reset when done
- Another way to bypass the sensor is to remove the wire from the Out sensor terminal (70). The 422 will give you an 'Outdoor Open' error but the 422 will operate as if it's 32°F (0°C) outside. If you can't get to a supplier for a new outdoor sensor that day, doing this will let the 422 supply heat until you can source one and come back

⚠ WARNING

As with any electrical product, care should be taken to guard against potential risks, including electric shock or personal injury.

Boiler Not Firing

- In the View menu, what is the Boiler Target vs Boiler Supply? If the boiler is at the target why fire?
- What is the differential? The 422 fires the boiler until it reaches the boiler target, plus half of the differential. Then it waits until it reaches half the differential below the target before firing the boiler again. Is the boiler in the cool down cycle?
- Is there a call for heat showing in the View menu?
- Is the On-Off/Mod DIP switch in the correct position for the type of boiler?
- Does the 422 View screen show the burner symbol?
- Check the output of the 422. Is it sending out the correct signal to the boiler? If this is the case look at field wiring or the boiler itself

Not Turning on the Mixing

- Is unit in WWSD?
- In the View menu, what is the Mix Target vs Mix Supply? Why dial up the mixing if it's at target?
- Is the control for the mixing device 440/444 configured properly? The mixing devices can perform mixing with either a floating action valve or an injection pump
- If using a floating action valve, are the open and close contacts reversed?
- What type of pump is being used to perform the mixing operation? The 422 requires a standard wet rotor non-ECM pump

Checking a Floating Action Valve

- Are the open and close contacts reversed?
- When going through the test procedure (via the Test button), it will open and close the valve. When opening the valve you should see 24VAC between C and Opn and 0VAC between C and Cls. It will be the opposite when closing
- To isolate the output of the mixing device label and remove the wires that go to the actuator. Re-run the test procedure and check voltages. If the device is putting out the proper signal then you need to check field wiring or the actuator
- To test the actuator, label the wires, remove them, and apply 24VAC directly to the open or close. It's also possible the valve assembly may be sticky. To test for this remove the actuator from the valve and re-run the test to see if actuator moves freely

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Checking a Variable Speed Pump

- The 422 operates a standard wet rotor non-ECM pump as a variable speed pump. It does this by controlling the voltage's sine wave that goes out to the pump. It is normal to measure the full 120Vac while operating below 100% mixing output, even at 0% output
- Is the mixing pump the correct type? It requires a standard wet rotor non-ECM pump
- When running the test do you feel or hear the pump ramping up and down?
- Another way to test the pump itself is wire it straight to 120VAC and it should run at full speed

Notes on Bus Configuration

- The 422 can have up to 2 mix temperature buses. Mix 1 zones & connections come through the zone/power manager that is paired beside the 422
- The second bus comes in on terminals 59&60. These can be assigned to either be a boiler bus or Mix 2. This is set by the Boiler/ Mix 2 DIP switch on the left of the 422

DHW

- DHW calls are not affected by WWSD
- The DHW call comes from an aquastat that must provide a voltage ranging from 20-260VAC across DHW Demand (terminals 53&54)
- Is the DHW mode setting correct? Check the DHW pump piping against the DHW mode diagrams on page 24 of the Data Brochure (I/O manual). Pick the correct mode so the system pump runs if necessary
- If the 422 is in Away mode, DHW calls will be ignored

Notes

- To see all available settings go into the Misc menu and set access level to Ad (Advanced)
- On the 422 not all menu settings in the manual appear. Some will be invisible based on bus configuration

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Sensor Resistance vs Temperature

Call customer service if you need assistance with technical details.

TEMPERATURE		RESISTANCE	TEMPERATURE		RESISTANCE	TEMPERATURE		RESISTANCE	TEMPERATURE		RESISTANCE
°F	°C	Ω	°F	°C	Ω	°F	°C	Ω	°F	°C	Ω
-50	-46	490,813	20	-7	46,218	90	32	7,334	160	71	1,689
-45	-43	405,710	25	-4	39,913	95	35	6,532	165	74	1,538
-40	-40	336,606	30	-1	34,558	100	38	5,828	170	77	1,403
-35	-37	280,279	35	2	29,996	105	41	5,210	175	79	1,281
-30	-34	234,196	40	4	26,099	110	43	4,665	180	82	1,172
-25	-32	196,358	45	7	22,763	115	46	4,184	185	85	1,073
-20	-29	165,180	50	10	19,900	120	49	3,760	190	88	983
-15	-26	139,403	55	13	17,436	125	52	3,383	195	91	903
-10	-23	118,018	60	16	15,311	130	54	3,050	200	93	829
-5	-21	100,221	65	18	13,474	135	57	2,754	205	96	763
0	-18	85,362	70	21	11,883	140	60	2,490	210	99	703
5	-15	72,918	75	24	10,501	145	63	2,255	215	102	648
10	-12	62,465	80	27	9,299	150	66	2,045	220	104	598
15	-9	53,658	85	29	8,250	155	68	1,857	225	107	553

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