

Aquadyne Tech Tip

Title: Troubleshooting X-10 Controls

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Products Affected

Octopus 2000, Octopus 3000, Octopus 4000

AquaGuard AG300, AquaGuard AG500

AquaNode ES Aquanode XL

Symptoms

1. Control modules do not respond to X-10 control commands;
2. Control modules turn on or off when they should not;
3. Control modules work in some A/C power outlets but not in others;

Possible Causes

1. An incorrect control module ID address has been set in the controller or on the control module;
2. Control system not enabled in system control menu;
3. There is interference on A/C power-line;
4. The A/C wiring characteristics of the installation;
5. The Aquadyne controller and satellite are installed on different transformer “phases” of the A/C power-line;
6. A multi-plug “power-strip” with surge-suppressor has been installed between the Aquadyne controller, power line interface and/or the control module(s);
7. Local control feature is causing module to turn on.

Resolution

Troubleshoot each possible cause

Procedure

1. An incorrect control module ID address has been set in the controller or on the control module:

The instrument sends control signals to control modules to turn them on and off. Addresses are assigned to each control module to assure the correct control signal gets sent to each module. Each Control System in the instrument has the ability to control the module(s) assigned to it. Each Control System has a Module ID (address) assigned to it. The module ID address on the module and the Module ID in the instrument must match in order for the instrument to turn the module on and off. To test a module:

Set the ID on the module by rotating the lettered selector (A to P) to the desired letter. Set the Unit number on the module by rotating the number selector (1 to 16) to the desired number. Take note of these settings. Plug the module into an AC outlet. Plug an incandescent light into the satellite and make

sure it's switch is on. The module may switch on at this time. This is the normal operation of the local control feature and not a fault of the module.

On the instrument enter the module ID by entering the SETUP menu then enter the SET MODULE ID menu. Select the system that you wish to assign the module to. Enter the system that you have selected. Select the ID letter (A to P) to match the letter on the module and press Enter. Select the number (1 to 16) to match the number on the module and press enter.

Exit the SET MODULE ID menu; do not exit the SETUP menu. Go to the SYSTEM TEST menu and enter it. When you enter the SYSTEM TEST menu all modules will be turned off. This will turn off all the devices connected to the modules. This is normal operation, not a fault. When you enter the SYSTEM TEST menu the instrument system status light will flash green/orange. Do not perform any system test until the instrument system status light has returned to the solid green condition. Select the system that you have just assigned the Module ID to, and enter it. The display will indicate that the system is OFF. Select System ON and Enter. The module should click on and the lamp should light. Re-select the system again and enter. Select OFF and Enter. This will turn the module and lamp off. Repeat this process several times to assure that it is consistent.

If the module does not switch on or off at all, you may have a defective module. To confirm this, substitute another module in the same location as the unit just tested. Set the ID to match that of the one you just tested. If the module switches to one state and not the other, or does not switch consistently then the following causes should be tested for: the instrument and module may be on different phases, there may be noise interference, there may be too much distance between the instrument and module, or you may have a surge suppressor between the instrument and the module. See procedures 3, 4, and 5 for additional procedures to help diagnose the problem.

Please note some ballasts required a certain "off" time before being able to be turned on again. If this is the case with your ballasts, "System Test" for these systems will not work until the ballast has reset itself.

2. Control system not enabled in system control menu:

If the module works as tested in step 1, then the instrument should control the device connected to it. If the device is not switching on and off as programmed, then the system may not be enabled.

Go to the OPERATION menu and select the SYSTEM CONTROL menu and enter it. Select the system that the module is assigned to and enter it. Select AUTO and exit the menu.

Go to the top screen and observe that the system you programmed is working. This may take some time, depending on what system you have enabled. As an example: If you have enabled the CHILLER SYSTEM, and the temperature set point is 79 +/-1 degree. If the temperature at the probe goes above 80 degrees, then the CHILLER SYSTEM should turn ON and the chiller should be run until the temperature reaches 79 when it turns off.

3. There is interference on A/C power-line:

TV Noise: Certain brands of TVs can generate noise and superimpose it on the power line. In most cases this kind of noise will not cause a problem. If however it is determined that the TV is causing a problem (which can be determined by unplugging the TV to see if the problem goes away) it is suggested that the TV be plugged into a filter to isolate it from the AC line. The kind of filter used to protect a TV from interference from power drills etc. is recommended (Aquadyne Part Number 63-000117, Regular Duty Isolator). This filter may also help to isolate the load (or internal capacitance) of the TV from the AC line if it is found that the TV is attenuating the signals from your Instrument(s).

Wireless Intercoms: Intercom systems, which use the house wiring to transmit can "block out", X-10 transmissions while the intercom is left in the permanent transmit (talk) mode. Unfortunately there is no simple solution to this problem but if the Instrument and all the Modules are on one phase the first thing to try would be to change them all to the other phase. It has been found that the Heavy Duty Isolator can in some cases attenuate signals from a neighbor's intercom sufficiently enough to allow the Instrument's signals to be received by the X-10 Modules. It is NOT possible to have a wireless intercom and an Instrument operating in the same house.

Other Device Noise: Suspect any device which you have recently plugged into an electric outlet in your location. Known causes of A/C power-line interference have been caused by neon lights and electronic recharging equipment, such as video camera and charger equipment. Unplug any device(s) which has recently been plugged into your location and see if X-10 operation returns to normal.

4. The A/C wiring characteristics of the installation:

The square footage and the electrical characteristics of AC wiring of the building where the system is installed can affect the quality of the signals that reach control modules. Each installation will vary depending on the square footage of the building, the number and types of electrical and electronic equipment connected, and how it is wired. Some situations may call for the installation of a bridge as described in 5; others may require a signal repeater. Since there are so many variables that may effect the signal quality, it is recommended that, a "Home Automation" company be retained to help for your individual solution. To find help, look in the Yellow Pages, under Home Automation.

5. The Aquadyne controller and module are installed on different transformer "phases" of the A/C power-line:

Modules Don't Respond. The most commonly encountered problem with systems which use the existing house wiring to transmit signals is that signals are received by some Modules but not by others, i.e. the Instrument controls some devices but not others or controls some devices intermittently. This can sometimes happen when the Module to be controlled is on the opposite phase of the house wiring to the phase, which the Instrument is connected to.

Phase coupling: In most cases the signals transmitted by the Instrument will control any Module plugged in anywhere in the house. The signal level transmitted is usually in the order of 4 to 5 volts but varies with line impedance and loading (Instrument plugged in next to a TV set etc.). However, the amplitude of signal required to operate a Module is only 50 millivolts (0.05 volts) so there is enough tolerance in the transmit/receive ratio to allow for considerable signal attenuation. Most signal attenuation occurs when the signal has to "jump the phases".

Most houses are wired such that 220v (240V) is brought into the breaker panel and then split into 2 phases of 110v (120V) each. The signals from the Instrument are transmitted onto one phase and have to travel all the way out to the pole transformer to couple across to the other phase. The amplitude of signal on the "other" phase can therefore be greatly reduced.

Signals can be "coupled" to the other phase by installing an X-10 Satellite Signal Bridge, (Aquadyne Part Number 63-000173), across the two phases in the panel, i.e. by connecting the Bridge capacitor across any 220V breaker. A qualified electrician should install this bridge.

6. A multi-plug "power-strip" with surge-suppressor has been installed between the Aquadyne controller and the module:

Aquadyne recommends that NO SURGE SUPPRESSION or surge suppression devices be placed between the instruments X-10 power line interface and the control modules. Surge suppression devices may interfere with the signals required to operate the modules. These devices may come installed in AC strips. Check the labeling on the AC strip prior to installing it into the system.

7. Local control feature is causing module to turn on.

If it is suspected that Modules have turned on by themselves, the first step should be to change the House Code on the Instrument and all of the Modules. It is possible that a neighbor has the same system or another compatible system and if both houses are on the same pole transformer, it is possible of signals to couple from one house to another.

If the problem persists, it is possible that the Instrument controlling the Modules has been triggered by a "spike" on the power line. Although this should be a rare occurrence it may help to fit a filter on each phase in the breaker panel, The Aquadyne X-10 Heavy Duty Isolator (110/220 VAC, 25A), Part Number 63-000118. It is suggested that a Heavy Duty Isolator is installed on both phases, but if the Instrument and all the Modules are on the same phase, one Heavy Duty Isolator on that phase may be sufficient.

If Modules turn on spuriously, it is also possible that the modules may have been triggered by a 120V AC power "dip" or "brown out". Appliance Modules have a feature called "local control". This feature allows you to turn the Module on by turning the power switch on the light or appliance off and then on again. There is a circuit in the Module, which detects this change in load and interprets it as a request to turn on. This "local control" circuit by design is very sensitive and can therefore sometimes change in the load and therefore "think" it has been told to turn on. Electronic Ballast that are common in VHO lighting and UV Sterilizers generate signals that can also turn on the local control. If this problem is suspected it is recommended that the local control feature be disabled.

Disabling the local control feature: It is possible to disable the local control feature of the Appliance Module by plugging a "cube tap" into the Module so that two items can be plugged into the same Module. Then, plug a 7 1/2-watt night light into one of the receptacles of the cube tap and the appliance you want to control into the other. When the Module is on, the appliance and night-light will be on. When the Module is off, the appliance and the night-light will be off. Now, even if you operate the power switch on the appliance, the night light is always "in circuit" so the Appliance Module's local control circuit is disabled.

You can also modify the Appliance Module internally to disable the local control feature. To do this you need to cut the small wire link next to pin 7 on the integrated Circuit (I.C.) in the Control Module. If you need help, contact X-10.

More Information: Troubleshooting X10 Controls Tech Tip

Prior to contacting Aquadyne Technical Service please read the appropriate manual sections relevant to your problem, and also consult the trouble-shooting guide located in the user guide.

If you have completed any tests or experiments to isolate and diagnose your system please make notes and have them available to help our technicians troubleshoot and answer your questions.

When Contacting Aquadyne Technical Service please be ready to provide the following information so that we may help you in the quickest most effective manner.

- 1) Who are you: Your complete name address, daytime phone number, and an email address if you have one.
- 2) Which Aquadyne product is involved? The Aquadyne product involved, the product part number, the part number revision letter, the system serial number and the software version number. The software version number is displayed each time the power-up sequence is initiated.

On the Octopus 3000 and the AquaGuard, the serial number and software version are available in the NEW PASSWORD menu. Entering the new password AQDYN will also display the serial number and software version. After observing and recording the Software Version and Serial Number, press ENTER four times to return to the Status Screen.

Technical Support is available at (858) 495-1040 from 10:00 AM to 5:00 PM, PST, Monday through Friday. You may also send mail to support@aquadyne.com.

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