

IQ-150 Troubleshooting Guide

To troubleshoot a problem with an IQ-150 system, take some time and thoroughly read through this guide before attempting anything. Once you have thoroughly read through this, you will need the following tools:

- IQ-150 Programming manual
- Volt meter that reads AC & DC voltage under 20 volts
- Small flat screwdriver
- Phillips screwdriver
- Wire strippers
- Wire cutters
- Replacement wire nuts
- Black electrical tape

To begin troubleshooting, it is important to understand that the IQ-150 system is a complex system, thus it has complex functions and troubleshooting the system requires a systematic, methodical process. Unfortunately, there is no “set-in-stone” step-by-step procedure that is in fact right for each problem encountered. There may be several causes to each problem, thus each problem/cause must be looked at individually.

The key to effectively troubleshooting an IQ-150 system is ISOLATION. By ISOLATING each component, each potential problem cause can be systematically eliminated until a problem is found. It is important to know that some components work by themselves, while others must have other components to function.

The functioning components of the IQ-150 system are listed below along with their possible functioning combinations:

- IQ-150 Controller alone
- IQ-150 Controller with photocell
- IQ-150 Controller with motion sensor(s)
- IQ-150 Controller with photocell & motion sensor(s)

Never will the photocell or motion sensor(s) function without being connected to the IQ-150 Controller.

PROBLEMS ENCOUNTERED:

There are 2 basic problems encountered with the IQ-150 system:

1. Lights do not come on.
2. Lights stay on, or they turn on and off intermittently.

Every problem encountered is some form of one or the other. Each has a variety of causes that must be systematically approached in order to find a solution. The next section details probable causes of each and how to approach troubleshooting.

This troubleshooting guide assumes that transformer(s) are working properly and fixtures have good, working lamps.

PROBLEMS, POSSIBLE CAUSES AND TROUBLESHOOTING APPROACH:

PROBLEM: LIGHTS DO NOT COME ON.

Things to check before approaching troubleshooting:

- Make sure IQ-150 Controller is programmed properly. Refer to IQ-150 programming instructions for proper programming procedure.
 - Make sure the POWER ON and AUTOMATIC lights are ON on the IQ-150 Controller. If these lights are not on, the IQ-150 Controller will not turn the lights on.
 - Make sure all wires to all components are hooked up in proper sequence. Refer to IQ-150 programming instructions for proper wiring instructions.
 - Make sure all connections are clean and tight.
 - Make sure all wires are intact. No knicks, cuts, scrapes, cut wires or insulation removed exposing copper wires.
 - Make sure photocell is located in an area where it will receive sunlight, as well as an area where it will not receive external light once it becomes dark.
 - Lights that do not come on almost always are a result of either the IQ-150 Controller not receiving or sending power properly, or the wires/connections between the module and the IQ-150 Controller being damaged, thus not allowing the proper flow of power. The photocell on rare occasions will cause the lights to not turn on. The only incidence of lights not coming on due to motion sensor problems is when the motion sensor(s) is activated and the lights do not come on.
 - If you have considered all the above listed factors, then the proper troubleshooting sequence is:
 1. Test controller for power in and out.
 2. Test wiring for voltage at each connection point.
 3. Test Photocell
 4. Test motion sensor
- ***Wiring problems will be detected through each troubleshooting procedure.

POSSIBLE CAUSES

TROUBLESHOOTING APPROACH

POSSIBLE CAUSES	TROUBLESHOOTING APPROACH
No display	Procedure 1
No power to IQ-150 controller	Procedure 1
Controller not operating automatically	Procedure 2
Controller not operating manually	Procedure 2
Photocell not functioning properly (Not likely)	Photocell Procedure, Procedure 1
Motion sensor(s) does not activate lights	Motion Sensor procedure, Procedure 1
Wiring Problems	Procedure 1 , Photocell Procedure, Procedure 2, Motion Sensor procedure

PROBLEM: LIGHTS STAY ON, OR THEY TURN ON AND OFF INTERMITTENTLY.

Things to check before approaching troubleshooting:

- Make sure IQ-150 Controller is programmed properly. Refer to IQ-150 programming instructions for proper programming procedure.
- Make sure all wires to all components are hooked up in proper sequence. Refer to IQ-150 programming instructions for proper wiring instructions.
- Make sure all connections are clean and tight.
- Make sure all wires are intact. No knicks, cuts, scrapes, cut wires or insulation removed exposing copper wires.
- Make sure photocell is located in an area where it will receive sunlight, as well as an area where it will not receive external light once it becomes dark.
- Make sure photocell is not covered with black electrical tape or any other foreign object.
- Make sure motion sensor(s) is aimed properly.
- Make sure motion sensor(s) is not picking up input from any external sources such as moving plant material caused by wind, moving water, cars, animals (dogs, cats, rabbits, etc.). Shielding the motion sensor(s) may eliminate the problem.
- Lights that stay on, or turn on and off intermittently are almost always a result of motion sensor input. Occasionally the sensor(s) is picking up external input and re-positioning or shielding will solve the problem. Most often it is a result of a failed motion sensor(s). Occasionally it is a result of a wiring problem anywhere within the system, not limited to motion sensor wiring. The photocell occasionally will cause the lights to stay on or turn on and off intermittently. The IQ-150 Controller, if programmed properly, will shut the lights off as programmed and is not the cause of the problem.
- If you have considered all the above listed factors, then the proper troubleshooting sequence is:
 1. Test motion sensor(s)
 2. Test Photocell

***Wiring problems will be detected through each troubleshooting procedure.

POSSIBLE CAUSES

TROUBLESHOOTING APPROACH

POSSIBLE CAUSES	TROUBLESHOOTING APPROACH
Motion sensor failure	Motion Sensor Procedure
Photocell failure	Photocell Procedure
Wiring/connection problems	Motion Sensor Procedure, Photocell Procedure

PROCEDURE 1:

IF CONTROLLER HAS NO DISPLAY:

THIS TEST IS TO DETERMINE THE CAUSE OF NO POWER BEING DELIVERED TO THE IQ-150 CONTROLLER. THE ULTIMATE GOAL IS TO GET A DISPLAY ON THE CONTROLLER. FOLLOW THE FLOW OF POWER **BACKWARDS** TO TEST. THE FLOW OF POWER BEGINS WITH THE IQ-150 MODULE, FLOWS THROUGH THE **PURPLE & BLUE** WIRES TO THE TERMINAL STRIP, THEN THROUGH THE **BLUE & GREEN** WIRES TO THE IQ-150 CONTROLLER. POWER IS **12-17 VOLTS AC**.

- A.** Disconnect all motion sensors and photocell from the CONTROLLER TERMINALS.
- B.** Using volt meter on AC setting, test CONTROLLER TERMINALS # 3 & 4 for aprox. 12-17 volts AC.
 - If power, but no display, CONTROLLER is bad, replace.
 - If NO power, continue to C.
- C.** Using volt meter on AC setting, test TERMINAL STRIP TERMINALS # 3 & 4 for aprox. 12-17 volts AC.
 - If power, check connections at TERMINAL STRIP TERMINALS # 3 & 4 and at CONTROLLER TERMINALS # 3 & 4. Re-test at C, then at B, follow above testing procedures until there is power at B. Re-do connections, replace wire between B & C, replace TERMINAL STRIP if necessary. If still no DISPLAY but power at B, CONTROLLER is bad.
 - If no power, continue to D.
- D.** Using volt meter on AC setting, test SPLICE WIRES GREEN & BLUE for aprox. 12-17 volts AC.
 - If power, check connections at SPLICE, TERMINAL STRIP TERMINALS # 3 & 4 and at CONTROLLER TERMINALS # 3 & 4. Re-test at D, C, then at B, follow above testing procedures until there is power at B. Re-do connections using wire nuts, replace wire between C & D if necessary. If still no DISPLAY but power at B, CONTROLLER is bad.
 - If no power, continue to E.
- E.** If all above tests have been performed and all connections have been checked and re-done, test the 2 metal prongs inside the IQ-150 RECEPTACLE for aprox. 12-17 volts AC.
 - If power, then replace the IQ-150 PLUG with a new one and test each point again. Follow above testing sequence if power/display is not present until power/display is present.
 - If no power, MODULE is bad. Replace module and follow testing sequence.

***Follow above testing procedures until a display is present on the IQ-150 Controller. Once you have a display on the IQ-150 Controller, turn lights on both manually... AND automatically by setting a “dummy” program on the IQ-150 Controller. Refer to IQ-150 programming instructions for manual and automatic operation.

- If lights come on both manually and automatically, the CONTROLLER and wires to and from the MODULE are functioning properly.
- If lights come on only manually or automatically, but not both, or they don't come on at all, continue to

PROCEDURE 2:

CONTROLLER HAS DISPLAY:

THIS TEST IS TO DETERMINE THE CAUSE OF NO LIGHTS COMING ON. THE ULTIMATE GOAL IS TO GET THE LIGHTS TO COME ON.

FOLLOW THE FLOW OF POWER TO TEST. THE FLOW OF POWER BEGINS WITH THE IQ-150 CONTROLLER, FLOWS THROUGH THE **BROWN & WHITE WIRES** TO THE TERMINAL STRIP, THEN THROUGH THE **RED & WHITE WIRES** TO THE IQ-150 MODULE. POWER IS **14-18 VOLTS DC**.

TO TEST, VOLT METER LEADS MUST BE AS FOLLOWS:

- POSITIVE LEAD ON TERMINAL #1**
- NEGATIVE LEAD ON TERMINAL #2**

- A.** Disconnect all motion sensors and photocell from the CONTROLLER TERMINALS.
- B.** Turn lights ON either by manually pressing the INCREASE button or setting a “dummy” program to come on automatically. Refer to IQ-150 programming instructions for manual and automatic operation.
- C.** Using volt meter on DC setting, test CONTROLLER TERMINALS # 1 & 2 for aprox. 14-18 volts DC. To test, volt meter leads must be as follows:
 - POSITIVE LEAD ON TERMINAL #1**
 - NEGATIVE LEAD ON TERMINAL #2**
 - If no power, CONTROLLER is bad, replace.
 - If power, but no lights, CONTROLLER is good, continue to D.
- D.** Using volt meter on DC setting, test TERMINAL STRIP TERMINALS # 1 & 2 for aprox. 14-18 volts DC. To test, volt meter leads must be as follows:
 - POSITIVE LEAD ON TERMINAL #1**
 - NEGATIVE LEAD ON TERMINAL #2**
 - If no power, check connections at TERMINAL STRIP TERMINALS # 1 & 2. Re-test at D, follow above testing procedures until there is power at D. Re-do connections, replace wire between C & D, replace TERMINAL STRIP if necessary.
 - If power, continue to E.
- E.** Using volt meter on DC setting, test SPLICE WIRES RED & WHITE for aprox. 14-18 volts DC. To test, volt meter leads must be as follows:
 - POSITIVE LEAD ON RED WIRE**
 - NEGATIVE LEAD ON WHITE WIRE**
 - If no power, check connections at SPLICE and at TERMINAL STRIP TERMINALS # 1 & 2. Re-test at E, follow above testing procedures until there is power at E. Re-do connections using wire nuts, replace wire between D & E if necessary.
 - If power, continue to F.

F. If all above tests have been performed and all connections have been checked and re-done, wire replaced where necessary, test the 2 metal prongs inside the IQ-150 PLUG for approx. 14-18 volts DC.

To test, volt meter leads must be as follows:

-POSITIVE LEAD ON PRONG CORRESPONDING TO RED WIRE

-NEGATIVE LEAD ON PRONG CORRESPONDING WHITE WIRE

-If no power, then replace the IQ-150 PLUG with a new one and test each point again. Follow above testing sequence if power is not present until power is present.

-If power, yet still no lights, MODULE is bad. Replace module and follow testing sequence.

***Follow above testing procedures until lights turn on BOTH manually AND automatically from the IQ-150 Controller.

-If lights come on both manually and automatically, the CONTROLLER and wires to and from the MODULE are functioning properly.

-If lights come on only manually or automatically, but not both, or they don't come on at all, repeat **PROCEDURE 2.**

PHOTOCELL PROCEDURE:

THIS TEST IS TO DETERMINE IF PHOTOCELL IS FUNCTIONING PROPERLY. THE ULTIMATE GOAL IS TO GET THE PHOTOCELL TO REACT PROPERLY TO LIGHT AND DARK INPUTS, AND TO DETERMINE WHETHER THE PROBLEM LIES WITHIN THE PHOTOCELL, THE PHOTOCELL WIRING, OR ANOTHER COMPONENT OF THE SYSTEM.

THE CONTROLLER MUST BE FUNCTIONING PROPERLY AND ALL WIRING TO THE CONTROLLER MUST BE HOOKED UP PROPERLY AND PROPERLY FUNCTIONING TO TURN THE LIGHTS ON AND OFF IN ORDER TO SUCCESSFULLY PERFORM PHOTOCELL TEST. IF CONTROLLER, WIRING, MODULE OR ANY OTHER COMPONENT RELATED TO THESE COMPONENTS NECESSARY FOR THEIR PROPER FUNCTION ARE NOT FUNCTIONING PROPERLY, REPEAT PROCEDURE 1 OR PROCEDURE 2 UNTIL THESE COMPONENTS ARE FUNCTIONING PROPERLY.

- A.** Disconnect all motion sensors and photocell from the CONTROLLER TERMINALS.
- B.** Remove the photocell from it's field location. Bring it back to the CONTROLLER and hook it directly to the CONTROLLER TERMINALS #8 & 9. The white wire hooks to #8, the red wire hooks to #9.
- C.** Cover photocell with black electrical tape to simulate darkness, then set a dummy program on the CONTROLLER to turn ON within a few minutes. Set the program to turn OFF after 5 minutes.
 - If lights come ON, remove tape from photocell...lights will go off. Repeat this process several times. If lights go ON and OFF as expected, photocell is functioning properly. Proceed to D.
 - If lights do not come ON, photocell is not functioning properly. Repeat this process 2-3 times to absolutely determine that photocell is bad. Replace photocell.
 - If lights flash ON and OFF, or stay ON, or do anything other than what they are supposed to do, photocell is not functioning properly. Repeat this process 2-3 times to absolutely determine that photocell is bad. Replace photocell.
- D.** Re-install photocell at it's location and re-connect photocell wires to the CONTROLLER. Repeat C with the photocell and wiring connected.
 - If lights come ON, remove tape from photocell...lights will go off. Repeat this process several times. If lights go ON and OFF as expected, photocell and wiring are functioning properly.
 - If lights do not come ON, photocell wiring is not functioning properly. Repeat this process 2-3 times to absolutely determine that photocell wiring is bad. Replace photocell wiring.
 - If lights flash ON and OFF, or stay ON, or do anything other than what they are supposed to do, photocell wiring is not functioning properly. Repeat this process 2-3 times to absolutely determine that photocell wiring is bad. Replace photocell.

MOTION SENSOR PROCEDURE:

THIS TEST IS TO DETERMINE IF MOTION SENSOR(S) IS FUNCTIONING PROPERLY. THE ULTIMATE GOAL IS TO GET THE MOTION SENSOR(S) TO REACT PROPERLY TO MOTION, AND SHUT OFF AFTER THE PROGRAMMED DURATION PERIOD. THIS TEST IS TO DETERMINE WHETHER THE PROBLEM LIES WITHIN THE MOTION SENSOR(S), THE MOTION SENSOR(S) WIRING, OR ANOTHER COMPONENT OF THE SYSTEM.

THE CONTROLLER MUST BE FUNCTIONING PROPERLY AND ALL WIRING TO THE CONTROLLER MUST BE HOOKED UP PROPERLY AND PROPERLY FUNCTIONING TO TURN THE LIGHTS ON AND OFF IN ORDER TO SUCCESSFULLY PERFORM MOTION SENSOR TEST. IF CONTROLLER, WIRING, MODULE OR ANY OTHER COMPONENT RELATED TO THESE COMPONENTS NECESSARY FOR THEIR PROPER FUNCTION ARE NOT FUNCTIONING PROPERLY, REPEAT PROCEDURE 1 OR PROCEDURE 2 UNTIL THESE COMPONENTS ARE FUNCTIONING PROPERLY.

- A.** Disconnect all motion sensors and photocell from the CONTROLLER TERMINALS.
- B.** Remove the motion sensor(s) from it's field location. Bring it back to the CONTROLLER and hook it directly to the CONTROLLER TERMINALS #5, 6 & 7 (Work with only ONE motion sensor INDIVIDUALLY at a time). The red wire hooks to #5, the green wire hooks to #6, and the black wire hooks to #7. Aim the motion sensor away from yourself and any potential nearby motion that could cause it to be activated unnecessarily.
- C.** Set the motion duration time for 1 minute per IQ-150 programming instructions. Wave your hand in front of the motion sensor.
 - If lights come ON, wait 1 minute (motion sensor duration) for lights to shut off. Repeat this process several times. If lights go ON and OFF as expected, motion sensor is functioning properly. Proceed to D.
 - If lights do not come ON, motion sensor is not functioning properly. Repeat this process 2-3 times to absolutely determine that motion sensor is bad. Replace motion sensor.
 - If lights turn OFF, then quickly turn back ON, or do anything other than what they are supposed to do, motion sensor is not functioning properly. Repeat this process 2-3 times to absolutely determine that motion sensor is bad. Replace motion sensor.
- D.** Re-install motion sensor at it's location and re-connect motion sensor wires to the CONTROLLER. Repeat C with the motion sensor and wiring connected. Wave your hand in front of the motion sensor.
 - If lights come ON, wait 1 minute (motion sensor duration) for lights to shut off. Repeat this process several times. If lights go ON and OFF as expected, motion sensor and motion sensor wiring is functioning properly.
 - If lights do not come ON, motion sensor wiring is not functioning properly. Repeat this process 2-3 times to absolutely determine that motion sensor motion sensor is bad. Replace motion sensor wiring.
 - If lights turn OFF, then quickly turn back ON, or do anything other than what they are supposed to do, motion sensor wiring is not functioning properly. Repeat this process 2-3 times to absolutely determine that motion sensor wiring is bad. Replace motion sensor.