

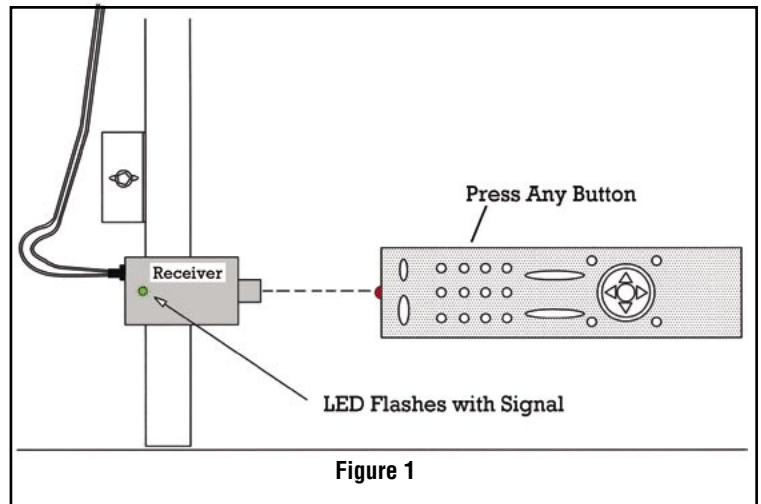
Photozell Oh Photozell

By Jack Ginther

When photocells first appeared as additional safety devices for residential openers, it was a good thing. Originally developed with child safety in mind, they have also helped with reduced car and garage door damage, but because of their location, they have been the source of increased service calls. During early workshops and seminars, there were more than a few Dealer questions regarding photocell problems. They wanted to know if there was a quick way to check the photocell circuit without wasting time, since the problem could possibly be a faulty opener control board, the individual wiring to each photocell, or possibly defective photocells, all of which were time-consuming to check.

In earlier days, I used to read the voltage on the back panel of the opener to see what voltage the opener was putting out on the photocell terminals, and then take a voltage check of the wires right at the photocells to see if the voltage was getting that far. This test at least let me know not to bother checking the wires and all the staples looking for a break from some heavy-handed installer (usually the do-it-yourself homeowner). If the voltage was there at the photocells, I then substituted each photocell individually.

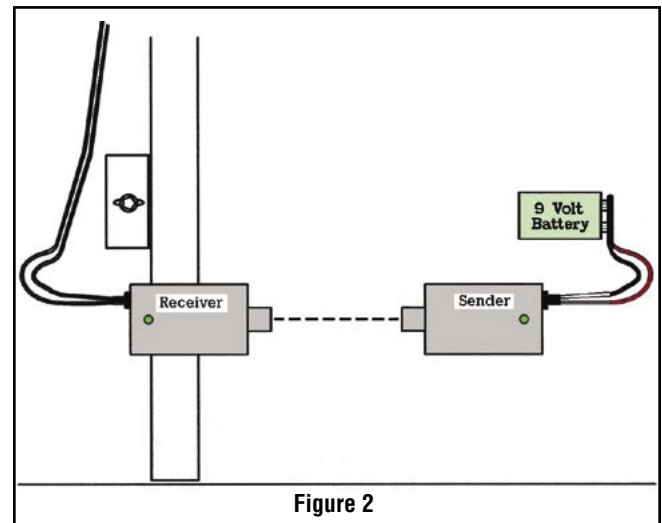
Although this saved some time, it was still slow, so after awhile, I said to myself, "...Self, why are you doing this slow stuff? ...there has to be a faster way of narrowing down the defective part." At some point I realized that the infrared signal produced by photocells was similar to remote controls used for TV's and VCR's, so I figured I would try a test using a TV remote control.



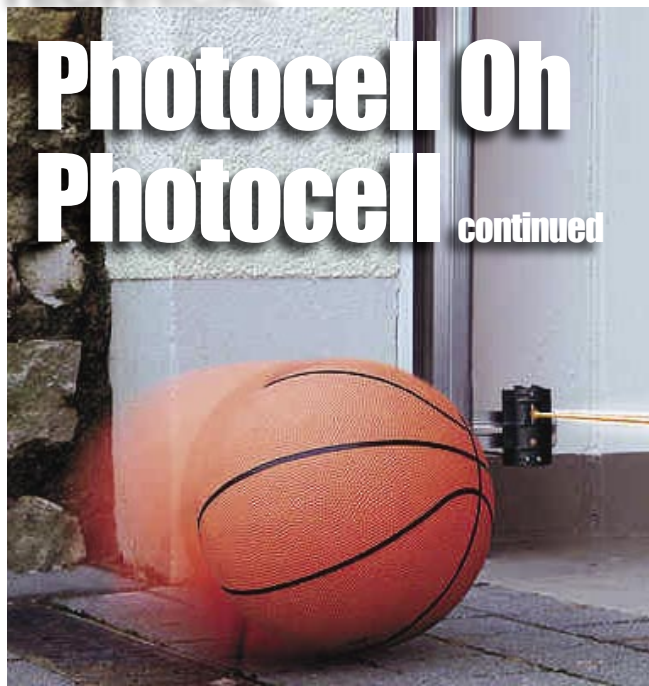
I blocked the opener 'sender' photocell and then pointed the TV remote at the 'receiver' photocell to see what would happen. If the 'receiver' photocell wiring was good, and the photocell was good, then the LED indicator light of the photocell would flash on and off, as TV remotes apparently pulse the signal as opposed to a garage door photocell which transmits a steady modulated signal. See Figure 1.

This was a strong indication that the receiver half of the safety circuit was good, which eliminated the voltage check of the wires, as well as substituting the 'receiver' photocell.

Since that worked, I then decided to take a spare 'sender' photocell and connect a 9-volt battery to it, since there is usually nothing more than an LED and a few components, like resistors or diodes inside a sender. (Observe polarity). On this particular photocell the black striped photocell wire connects to the positive + battery wire. Sure enough, the LED lit up on the sender. To see if it was actually sending an infrared signal, I then performed the same test as the TV remote by blocking the existing 'sender' photocell, and then using my 9-volt tester. It worked perfectly. The receiver photocell lit which showed that the sender was in fact sending an infrared signal. See Figure 2.



Continued on page 62



I then tried a radio control transmitter, and the door closed normally. I now had a portable receiver tester. I tried it on different homes with different models, and found that it worked on almost all of them. There were only a few models that didn't work like the rest. The 'receiver' photocell lit up when it received the signal, but the door wouldn't close with the remote control. Apparently the modulated LED signal is different on some brands. But again, it was a strong indication that the receiver photocell was good, like the TV remote test. In this case, try using a photocell of the same manufacturer, and try it out.

I now needed a tester to check existing 'sender' photocells, so I felt that if this 9-volt battery hook-up worked with the 'sender' photocell, then I would try it on a 'receiver' photocell and see what happened. It worked. I let the existing opener 'sender' photocell transmit to the 9-volt test 'receiver' photocell. The LED lit up, showing that it received infrared from the 'sender'. I now had a portable tester to check existing 'sender' photocells. Of course you can't operate the door with a radio control transmitter since the test 'receiver' is not connected to the opener, but you will know immediately if the 'sender' photocell is transmitting a signal. See Figure 3.

This procedure narrows down what works and what doesn't work, real fast. No fooling around with looking for cut wires from heavy-handed installers, or voltage checks, or substitutions.

Since everyone replaces old worn out door openers, then you can salvage some old photocells from different brands, and use them for your testers, and then all you have to do is cut the battery harness off some old remotes and you have all the parts needed. Output voltages for photocells have

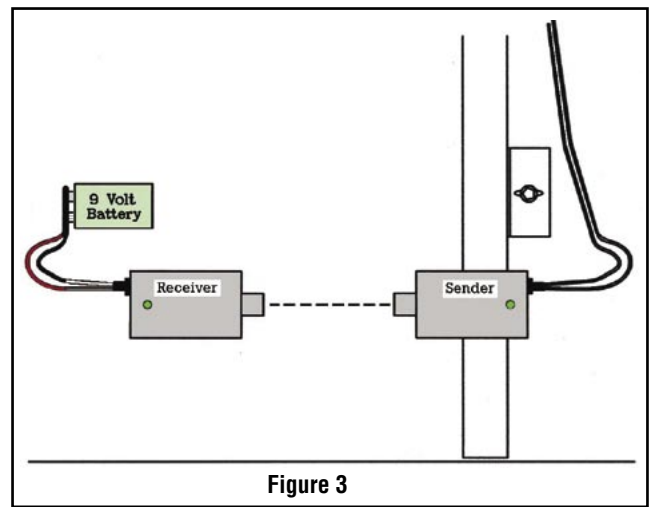


Figure 3

typically ranged from 5 VDC to 12 VDC for different brand openers, so a 9-volt battery should supply enough power for the short test without damaging whatever tester you decide to use, and you'll be using old photocells anyway.

I always liked photocell service calls. They kept my cash register ringing quite a bit, as the majority were nothing more than out of alignment problems caused by careless use of shovels, rakes, wagons, bikes, and all the other 'stuff' found in garages. Many other calls turned out to be corroded wires right at the photocell because of the close proximity to the ground, where rain splashed easily on the photocells.

Experience has shown that photocells are either good or bad. There doesn't seem to be an in-between, so if you have a service call where the customer complains of intermittent problems, and you know it's not an alignment problem, then I would suspect wiring problems right away, where tight staples or wire wrapped tightly around angle iron down hangs or other sharp metal objects were the culprits behind these types of intermittent problems, where the wire jacket was cut just enough to allow an occasional short due to humidity or temperature changes. When in doubt replace the wires.

If both sender and receiver tests failed, then it's a good bet that the opener control board is the culprit. I haven't mentioned the control board as a suspect too much because I rarely found board problems unless there was an electrical surge situation, which usually affected other sections of the board. The fastest way to determine if the control board is the culprit is to disconnect existing wires from the terminals and connect another known good set of photocells. So make up a portable set of your own instead of going to the trouble

Continued on page 64

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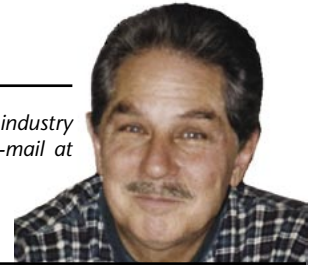
Photozell Oh Photozell continued

of substitution of the originals. That way you also eliminate any possibility of shorts or breaks in the existing wiring. See Figure 4.

Make up a few sets of old photocells from a few different brands. Mount them on a piece of angle iron, and then you'll be ready for a fast test of the opener control board. I thought there might be a problem with the photocell optics close together, but it didn't cause problems. Leave a small space between them so that you can break the beam for reverse testing.

I'm surprised that Manufacturers haven't developed test equipment like this. So, if any of you manufacturers decide to

Jack Ginther has been in the door industry 40 years. Jack can be reached by e-mail at ohdoors@localnet.com.



copy my idea, just send a check to my favorite charity, which happens to be "The Jack Ginther Benevolent Association", a well-known local charity that supports old worn out Garage Door Installers.

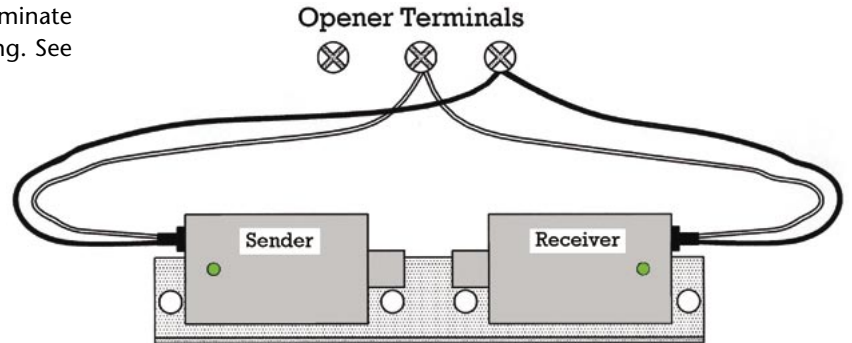


Figure 4

