Add Undercabinet LED Lighting

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Add undercabinet LED lighting
Help make meal prep easier and add mood lighting with peel-and-stick tape lined with LEDs  BY SAL VAGLICA  • PHOTOGRAPHS BY KOLIN SMITH

THERE WAS A TIME when installing undercabinet lighting meant picking between chunky, flickering fluorescent tubes or burning-hot halogens. But with low-voltage wiring, brightening a kitchen is easy: Press some LED-lined tape in place, and soft-white light will beam down and show off your countertop and backsplash. Because the system daisy-chains light strips together, it's customizable to any kitchen configuration, including our L-shaped layout with wall cabinets of varying heights.

The wiring is thin enough to hide behind the cabinet face frames, so you'll never see it, and a wireless dimmer switch puts the control where you want it without putting holes in your walls. Follow along as This Old House senior technical editor Mark Powers shows you how to let in the warm light.

COST  About $239
TIME  Two days
DIFFICULTY  Easy. You control the system with a wireless touch pad, but you might have to add an outlet to supply power.

Soft-white LED tape lighting, about $6 per linear foot, 30-watt LED lighting power supply, $30. LED dimmer, $20. Wireless dimmer touch pad, $18. All by Armacost Lighting homedepot.com
**TOOLS**
- voltage tester
- multibit screwdriver
- drywall saw
- fish tape
- linesman pliers or wire strippers
- electrical tape
- tape measure
- scissors
- utility knife
- mini slotted screwdriver
- ½-inch paddle bit
- drill/driver
- clamp

**MATERIALS**
- $\frac{3}{4}$ wire: Get enough to add an outlet above the cabinets.
- wire nuts: Get line- and low-voltage sizes.
- remodeling box
- power supply
- dimmer switch
- $\frac{3}{4}$ solid-core wiring: Get a small roll.
- terminal
- LED tape: Get enough to span the run of cabinets.
- denatured alcohol
- extension connections
- wireless switch
- staples

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**DAY-TO-DAY TIMELINE**

**SATURDAY**
Add the new outlet and power supply (Steps 1–3).

**SUNDAY**
Run wiring for the lights (Steps 4–5).

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**1 Add an outlet**

A) **Feed up the fish tape**
To power the lights, we installed a remodeling wiring box above an upper cabinet and borrowed from the dedicated circuit powering the microwave. Start by flipping off the breaker to the existing outlet, then check with a tester that the electricity is off. Pull out the outlet and, with a screwdriver, bang free one of the metal knockouts in the box. Use a drywall saw to cut a hole for the remodeling box in the wall above the cabinet. Feed the fish tape up through the knockout, as shown, and out of the new hole in the drywall.

B) **Pull down the wire**
With pliers, strip the insulation off the length of $\frac{3}{4}$ wire. Hook the ground to the fish tape and cover the connection with electrical tape, as shown. Pull the fish tape through the knockout until about 10 inches of wire is exposed, then free the fish tape. Cut the first six inches of wire for pig tails, and use a utility knife to free the three individual wires from the yellow sheathing. Strip all the ends of the pig tails and the ends of the $\frac{3}{4}$ wire. Grab all three white wires—for the existing outlet, the new outlet, and the pigtail—and join them with a wire nut. Repeat the process for the black and ground wires. Rewire the existing outlet, push all the wiring into the box, and screw the outlet back into place.

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**TIP**
Plan to use an accessible but hidden outlet to run the LED power supply, like one above or inside a cabinet. If you’re adding an outlet, locating the new one in the same stud bay as an existing outlet makes using the fish tape easier.
2 Install dimmer switch

**A] Add dimmer** At the opening for the outlet, cut the ⅛-inch wire and thread it through a remodeling box. Install the box in the wall, strip the wires, and attach them to the new outlet. Screw the outlet in place and secure the trim plate. Add the power supply’s red and black wires to the inputs on the wireless dimmer; red to positive, black or white to negative, as shown. Complete the connection by tightening the setscrew.

**B] Plug in the power supply** Place the power supply and the dimmer on top of the upper cabinets. Plug the power supply into the new outlet. Cut a length of ¾-inch solid-core wiring—sold as thermostat wiring—so it’s long enough to reach from the dimmer down the back of, and underneath, the corner cabinet. Drape the wiring along the cabinets, as shown.

**TIP** Let the system’s wiring hang free until all the LED tape is in place, then go back and secure wires and terminals to the cabinets with staples and screws.

3 Power up the lights

**A] Wire up the terminal** Cut the red and black wire so that it reaches the center underneath the corner cabinet. Add the red wire to one end of the terminal and tighten the setscrew, as shown. Repeat the process for the white or black wire. From here, you’ll add wiring to branch in two directions to cover both walls of the L-shaped kitchen.

**B] Cut the tape** From the middle of the corner cabinet, measure the length of tape needed to cover the cabinets along one wall. Use scissors to cut the LED tape across the center of the copper contacts, as shown. Repeat the process for the other wall of cabinets.

**C] Wire up the LEDs** Use LED tape-light extension connections to turn the terminal into a splitter, sending power to both walls. These 4-foot extensions have two wires, white for positive and white with a black stripe for negative, with a clip on one end that clips onto the LED tape. Join the tape to the extension by peeling away the adhesive backing under the copper contacts. Slide the tape into the connector with the label facing up, as shown. Make sure to align the polarity of the extension to the markings on the tape. Wiggle the tape in so it seats completely. Flip the connector over and snap the lock closed with a slotted screwdriver. Repeat this process for the LED tape running under the other wall of cabinets. Then twist together the positive ends of the extensions and fit them into the terminal across from the red wire. Tighten the setscrew and add both negative wires to the terminal in the same way.
4 Adjust the light

A] Tweak the beam  Restore the power at the panel. Hold the tape to the underside of the cabinet and adjust the light’s coverage. Keep the strip 1 to 2 inches back from the face frame to distribute the 120 degrees of light evenly across the backsplash and countertop, as shown. If you have a dark countertop, install the tape against the back of the face frames, with the LEDs pointing toward the backsplash, to eliminate bright spots.

B] Create passageways  Once you determine the light’s location—ours is about an inch away from the face frame—drill a ½-inch-wide hole with a paddle bit through the sides of neighboring cabinets at that spot, as shown. This allows the LED tape to travel underneath the cabinets. To install the LEDs against the face frame, slice through cabinet sides with an oscillating tool. Don’t press the tape in place yet.

5 Transition over the sink

A] Get inside a cabinet  Drill more holes underneath the cabinets to allow the wiring to pass through. In kitchens where wall cabinets change height, such as to a shorter one above a sink, run wiring inside the adjacent taller cabinet. Clamp plywood scrap to the inside of the cabinet, to prevent tear out, then drill a ½-inch-wide hole with the paddle bit in the corner, as shown. Add a second hole, 90 degrees to the first one, through the cabinet wall and in line with the underside of the shorter cabinet above the sink.

B] Press the tape in place  Wipe the undersides of the cabinets with denatured alcohol so the tape will stick properly. Peel the backing off the LED tape and press it in place under the straight run of cabinets. The tape on the far end closest to the shorter cabinet above the sink should line up with the hole, as shown.

C] Wire inside the cabinet  Align the polarity of the free end of the tape and an extension, and clamp down the connection. Fish the wires up through the hole and into the corner of the cabinet. Measure, cut, and add extensions to enough LED tape to cover the underside of the cabinet above the sink. Push the wires through the hole in the taller cabinet. Twist together the two stripped positive wires and secure them with low-voltage wiring nuts. Repeat the process for the negative wires, as shown. Tuck the wires into the corner of the cabinet’s face frame.

D] Add the switch  Peel and stick the LEDs to the underside of the cabinet above the sink. Screw the wireless touch pad’s bracket to the wall and install the switch and cover plate. Disconnect the power, then plug the power back in; the touch pad should pair with the wireless dimmer. Now screw the terminal to the underside of the cabinet.