



## Project board GFCI

**Program:** Electrician Technician

**Course:** EL190

**Objective:** Under the supervision of your instructor, you should be able to do the following:

- Wire a GFCI for protection of only itself and for protection of other devices.
- Explain how a 3-way switch works
- Explain how a single pole switch works
- Explain how to make a duplex receptacle into a ½ hot or switched outlet.
- Install a basic light fixture

**Lab Equipment:** Project Boards

**Required Tools:**

- 1 – Flathead screwdriver
- 1 – Pair of strippers
- 1 - Phillips's screwdriver
- 1 – Plug-in tester

**Materials:** (Includes project boards material)

- 2' - 14 AWG THHN black
- 2' - 14 AWG THHN white
- 2' - 14 AWG THHN green
- 2' - 14 AWG THHN red
- 2' - 14 AWG THHN blue
- 6 – 4S boxes no brackets
- 12 – ½" EMT set screw connectors
- 40" ½" EMT pipe
- 1 – 24" x 16" plywood
- 12 – ½" screws
- 6 – Green ground screws
- 15 – Red wire nuts
- 1 – GFCI receptacle
- 2 – single pole switch • 2 – 3-way switches
- 1 – duplex receptacle
- 2 – keyless fixtures
- 2 – lamps
- Power cord



**Safety (PPE):**

- Safety glasses/goggles
- Hard hat

**Resources:**

- N/A

**Required Time:** Two days

**Shop Maintenance:**

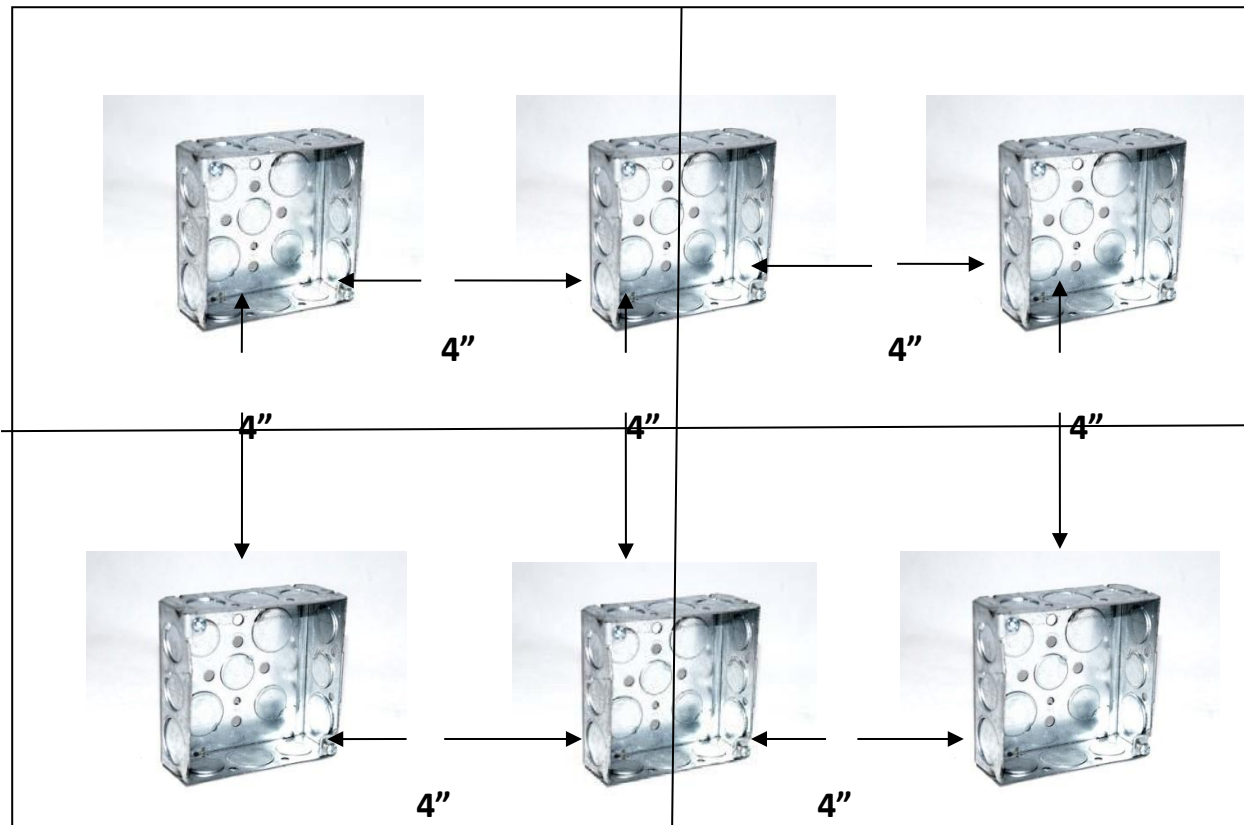
- All work will cease 20 minutes prior to the end of class.
- All work areas must be cleaned.
- Tools and equipment must be cleaned and returned to the designated areas (cage, tool room, cabinets etc.)
- Any broken or missing tools must be reported immediately.
- Tools and equipment are students' responsibility

**Procedure:**

1. Wire from a power, to a GFCI, to a switch, to a keyless light fixture (operated by the switch), on the LINE side.
2. Wire from a power, to a GFCI, to a switch, to a keyless light fixture (operated by the switch), on the LOAD side.
3. Wire from a power cord, to a GFCI, to a duplex receptacle to a switch to a keyless light fixture (operated by the switch), on the LINE side.
4. Wire from a power cord, to a GFCI, to a duplex receptacle, to a switch, to a keyless light fixture (operated by the switch), on the LOAD side.
5. Wire from a power cord, to a GFCI, to a 3-way switch to a keyless fixture to another 3-way switch, which operates the light on the LINE side.
6. Wire from a power cord, to a GFCI, to a 3-way switch to a keyless fixture to another 3-way switch, which operates the light on the LOAD side.
7. Wire from a power cord, to a GFCI, to a Duplex receptacle (1/2 hot), to a switch, to a keyless light fixture, on the LINE side. The switch operates both the ½ hot and the light.
8. Wire from a power cord, to a GFCI, to a Duplex receptacle (1/2 hot), to a switch, to a keyless light fixture, on the LOAD side. The switch operates both the ½ hot and the light.
9. Wire from a power cord, to a GFCI, to a duplex ½ hot receptacle, to a switch, to a 3-way switch, to a keyless light fixture, to another 3-way switch, on the LINE side. The switch operates the ½ hot and the 3-way switches operate the keyless light fixture.
10. Wire from a power cord, to a GFCI, to a duplex ½ hot receptacle, to a switch, to a 3-way switch, to a keyless light fixture, to another 3-way switch, on the LOAD side. The switch operates the ½ hot and the 3-way switches operate the keyless light fixture.
11. Wire from a power cord, to a GFCI, to a switch from the LINE side to a light fixture, (operated by the switch). Then from the GFCI, wire to a switch from the LOAD side to a light fixture, (operated by the switch).



## Project Board



Example for number 1:

- First box (Top Left) - Power cord coming in from the left side, GFCI device will be installed
- Second box (Top Middle) - One single pole switch, (Line side of GFCI), will be installed
- Third box (Top Right) - One keyless light fixture will be installed operated by the switch in box 2

Example for Number 11:

- First box (Top Left) - Power cord coming in from the left side, GFCI device will be installed
- Second box (Top Middle) - One single pole switch, (Line side of GFCI), will be installed
- Third box (Top Right) - One keyless light fixture will be installed operated by the switch in box 2
- Fourth box (Bottom Left) - One single pole switch, (Load side of GFCI), will be installed
- Fifth box (Bottom Middle) - One keyless light fixture will be installed operated by the switch in box 2

