

Example: Some “Standard Relay” Module Circuitry

Relay being driven by: Controller Output (eg Security Panel, PLC, circuit board); 12 vDC Digital Logic Circuitry

1. DIGITAL SIGNAL REQUIREMENTS

Please read the manual *Example: Digital Signal Requirements* for background information to better understand the circuitry that follows.

Also, please note that if you are interested in 24 vDC systems, then BasicRelay24 (RY24DC8/02) and/or RelayPair24 (RP24DC8/03) may suit.

2. CONTROLLER OPEN COLLECTOR OUTPUT^{(1), (2)}

Many controllers provide an “Open Collector Output” using an NPN transistor or similar (eg Darlington Pair/Array, N Channel MOSFET). An NPN transistor based Open Collector Output is shown in Fig 1.

This circuit is a great way of interfacing low-level logic circuitry (eg ICs, 5 vDC systems) to higher voltage devices such as relays. The transistor acts as a switch. When the base of the transistor is at earth (0 vDC), the transistor is Off so the relay Coil– terminal is not connected via the transistor to earth (0 vDC) so the relay is Off. But when the base is pushed to (say) 5 vDC then the transistor is On and now the earth (0 vDC) is connected to the relay Coil– terminal enabling current flow and so the relay is On.

3. CONTROLLER RELAY OUTPUT^{(1), (2)}

Some controllers provide relay out puts. Fig 2 demonstrates a typical way of wiring up one of our relay modules when a SPST signal relay has been used to provide a controller’s output.

You will note that we have shown the circuitry when both sides of the controller’s relay’s switch are available as external outputs.

If only one output from a controller’s relay is available, then it will act like an Open Collector Output (refer item 2 above) if the relay’s other output is connected to earth (0 vDC) on the controller’s circuit board.

4. 12 VDC DIGITAL CIRCUITRY OUTPUT⁽²⁾

Fig 3 is an example of a relay module being used a 12 vDC digital logic circuit output. This is part of the digital circuit for our example application *Simplified Traffic Lights v1*.

The wiring associated with operating the *Red Light* Relay12 (far left of the Figure) is shown in red.

Consider how the +12 vDC source for the relay’s Coil+ terminal is wired. It starts as a connection from the +12 vDC supply rail into the C (or Common) terminal of the relay switch on the DualTimer12 for the Yellow Light. If the Timer is Off then the relay is Off and therefore current can flow from the relay’s C to its N/C (Normally Closed) terminal. Note the similar wiring on the Green Light DualTimer12 and the “Memory” DualTimer12 modules. Therefore, the circuit to supply power to the Red Light relay (to turn it ON) is only complete if all DualTimers are OFF.

Notes:

1. Ensure that any Outputs connected to a relay module are of the proper type and specification.
2. Examples should be read in conjunction with the generic manual instructions for the BasicRelay12 (RY12DC8/02) and the RelayPair12 (RP12DC8/03). No warranty is expressed or implied. In no event will the authors, ULTRAsmart, Jarvis (Australia) Pty Ltd or its employees or directors be held liable for any damages arising from the use of examples. Examples are not intended as technical advice. It is the user’s responsibility to use our modules safely, correctly, and appropriately.

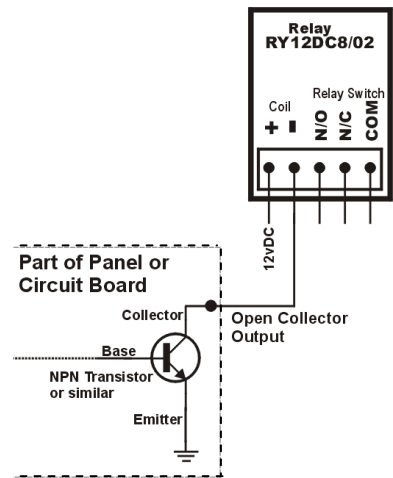


Fig 1. Open Collector output to a relay module.

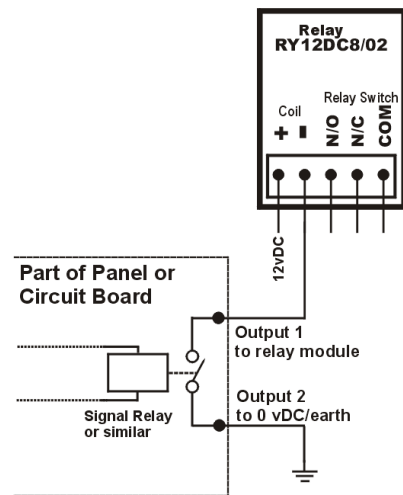


Fig 2. Signal Relay output to a relay module.

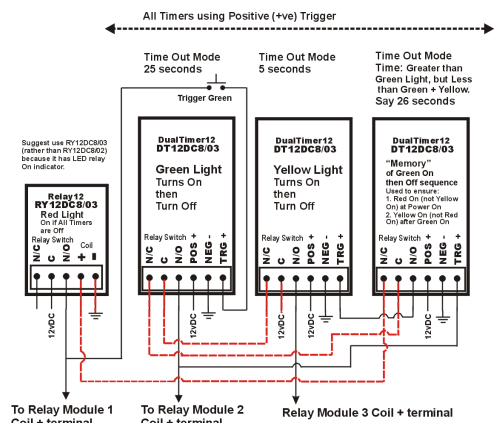


Fig 3. Using a relay module for 12 vDC Digital Logic output.