

Driving a Relay using the BD2 Electronics Board

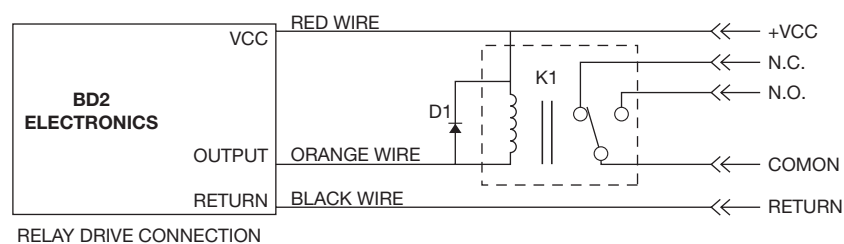
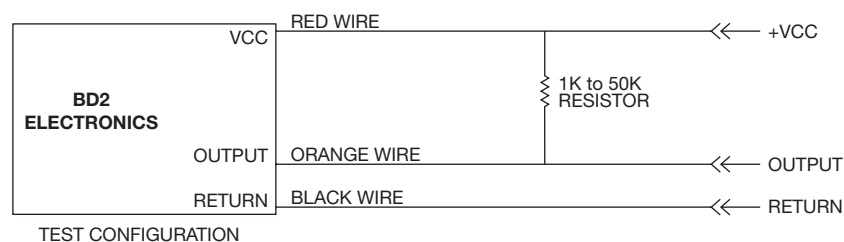
The BD2 board has an open collector output. This output consists of a 2N2222A transistor at the output capably of sinking loads up to 100 mAmps (0.1 Amp) to Return. This type of output will not produce a voltage output by itself. To test the basic operation of a BD2 board, a pull up resistor is required. Any value in the range of 1K to 50K ohms is acceptable to test board functionality.

See figure below for a connection schematic.

A relay may also be connected as shown below. Chose a relay with the same pull in voltage as the BD2 power supply so this single supply may run both. In operation, the BD2 board will bring the Output terminal to return (0 volts) in the wet condition. This puts the VCC supply across the relay, closing it.

A 'catch' diode is show across the relay. This is necessary to prevent damage to the transistor when it is turned off. Many modern relays come with this diode pre-installed internal to the relay itself. If the relay has this diode, insure the proper relay polarity connected is used. If this diode is not internal, it should be added externally. A common diode such as a 1N4001 will work in most circumstances.

Also note the relay and the BD2 do not have to run off the same voltage. The BD2 can be ordered to run at 5 volts, 12 volts, or 24 volts. Since the transistor at Output has a large voltage rating, the relay may run off up to 30 volts.



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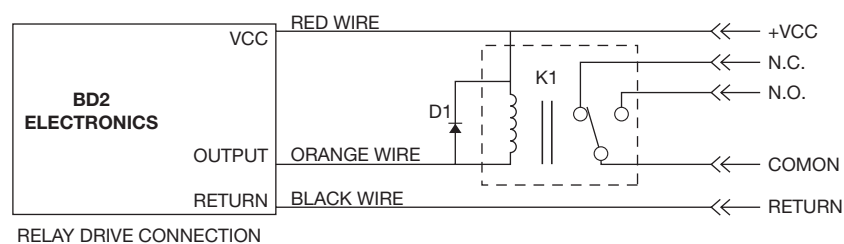
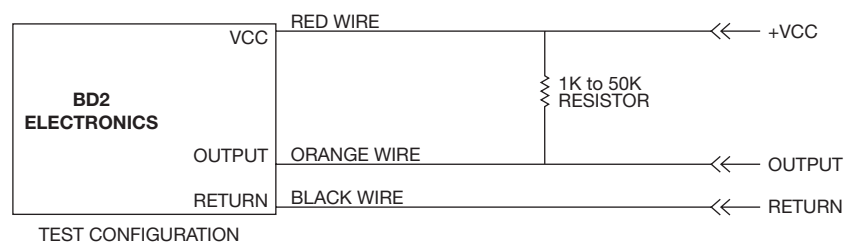
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Ultrasonic Sensor Installation for Model BD2

A frequently asked question we get is "how can I test my Introtek board and sensor?" Below is a diagram of how to connect the device for testing.

The RED and BLACK wires provide power to the board, 30 to 40 milliamps (depending if you took the LED option) is enough to turn the board on. 24 volts power is standard, please double check your purchase order with us to see which power option you chose (as 24 volts will permanently damage a 5 volt power option unit).

The output is an open collector pull down, so you will need a resistor pull-up, such as the 1 kilo ohm resistor in the diagram.

The leads from the sensor plug into J1 and J2. These cables may go in either jack; inside the sensor they are identical for all uses.

To check the air detection function, you may simply immerse the detector end of the sensor in a cup of water to simulate a wet tube, and remove the sensor from the cup to simulate a dry tube. Using a cup of water for this test removes any coupling issues to verify the sensor and board are truly working.

Sensors are designed to work with a narrow range of tubing types and sizes. This is why we request a sample of your tubing for our test department, and you should test with the same tubing.

"Free Entry" sensors, those with a U shaped opening typically do not require any coupling agent.

"Clamp on" sensors, those in two halves that are bolted around a tube typically do require such an agent. For test purposes, petroleum jelly may be used. A more permanent agent (and also neater in use) is Teflon tape, such as used in plumbing work to seal threads; just wrap a single turn around the tube.

