

OPTO-DTR1

#1552



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INSTALLATION & OPERATION

The OPTO-DT has two sets of terminal strips which are used when installing the OPTO-DT for operation. The first set is used for the connections to the relay contacts and the 12 volt regulated DC input power. With the relay positioned to the left of the circuit board and the alignment LED at the lower right corner, the connections to the left terminal strips are as follows:

Upper terminal #4 and Lower #1

Normally Open contact.....when relay activates this contact is connected to the common contact (N/O).

Upper terminal #3 and Lower #2

Common contact.....switches between N/O & N/C.

Upper terminal #2 and Lower #3

Normally Closed contact.....this contact is connected to common, except when the relay is activated, the contact is disconnected (N/C).

Upper terminal #1 : (+) connection from the 12 volt DC power

Lower terminal #4 : (-) connection from the 12 volt DC power

Note: Reverse polarity of the 12 volt DC input power or not using 12 volt regulated DC will damage the OPTO-DT and will not be warranted for consequential damage. All connections should be done with the power OFF and all wires should not be stripped longer than 1/8" so as not to allow shorting to occur to the circuit board tracks at the barrier strips on the printed circuit board. Wires are to be stripped and placed into the open hole, then the screw is to be turned CW until the wire is clamped into the barrier strip. Using too small of a gauge of wire or solid wire will not produce a proper connection.

OPTO-DTR - INFRA-RED OPTICAL DETECTION REFLECTIVE

The OPTO-DTR is a detection device in which the output relay (DPDT - Double Pole Double Throw) is activated when the optical path of an infra-red beam is reflected back to the sensor. The Opto-DTR3 allows up to three separate infra-red beams activating the same relay.

The electronic circuitry must be powered by a regulated 12 volt DC supply (see our 12VPS, item 369) in order to function properly, failure to do this will destroy the electronics.

The infra-red emitter and detector are contained in a single housing. They can be mounted on the layout so as to establish a line of sight beam reflection where detection is desired. The detector can sense an average of up to 4" and must be aligned properly. To assist in this alignment, there is an LED on the OPTO-DTR which illuminates when proper adjustment is achieved. The Opto-DTR3 has switches so that each emitter/detector set can be independently aligned.

The OPTO-DTR can be set for two distinct time functions. In NORMAL function, with the time adjustment at minimum setting, the relay will be activated (on) when the infra-red beam is reflected and relaxed (off) when the beam is not. As the time adjustment is increased a minimum (on) time for the relay is established. When the beam is reflected the relay is (on) for at least the minimum time period. If the beam remains reflected beyond the minimum time period the relay stays (on) until the beam is no longer reflected. In TIMER function, when the beam is reflected, the relay is (on) for the duration of the time adjustment, then relaxes (off). The relay will not again activate until after the beam is restored which will allow the circuit to reset. This time adjustment is variable from momentary to about 60 seconds.

Each OPTO-DT is furnished with the appropriate number of optical couplers.

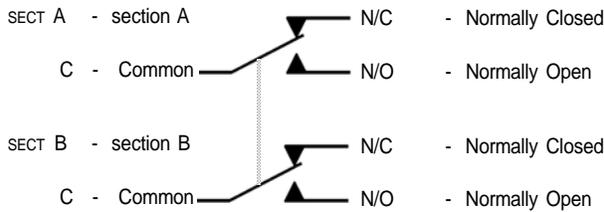
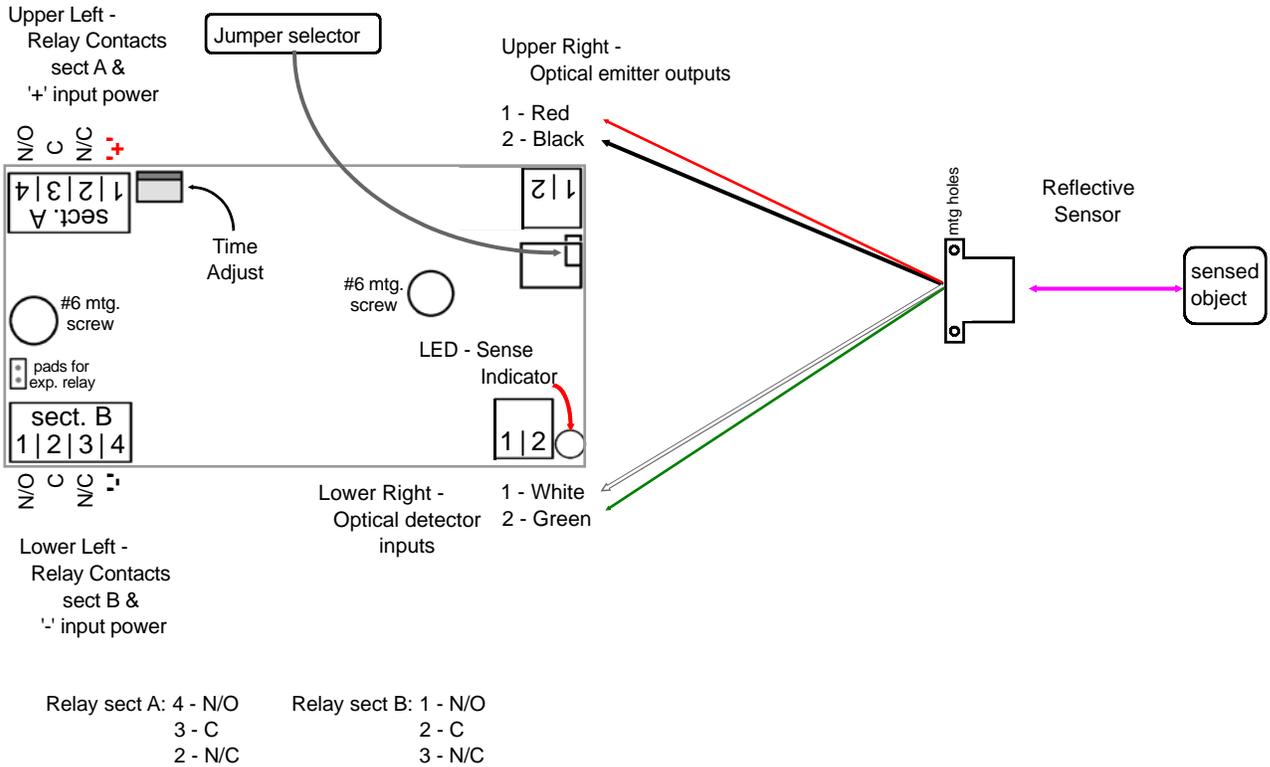
The second set of terminal strips, to the lower right and upper right, are used to connect the optical reflective sensor. Colored wires are supplied and need to be connected as shown. These should not be connected in reverse polarity since damage to the detectors may occur!

The reflective sensor is supplied with wires attached and mounting holes. When attaching these sensors to the layout please use screws and care so as to minimize physical damage to the devices. To extend the distance between the reflective sensors and the main board, it will be necessary to lengthen the wires. When extending these wires it is absolutely essential that the proper connections from the reflective sensor devices to the OPTO-DTR board be maintained. If the polarity is reversed the optical devices will be damaged. If outside electrical interference occurs, twisting the wires will help. As a further aid in preventing optical interference would be to make a hood or shield on the reflective sensor. This is only required if sensing without a hood is nearly impossible due to too much ambient light. To shield from sunlight in outdoor type layouts, place the reflective sensor inside a house or building. You may also want to paint the interior flat black to avoid reflections. Then mount the sensor far enough back so that the sunlight will not strike the sensor's face and yet leaves a straight line of sight to the sensed object.

After mounting the optical sensor and making all electrical connections to the OPTO-DTR1 board it is time to power up and check the alignment of the optical path. When the alignment is correct the LED in the lower right corner of the board will turn off.

"Jumper Selector" is used to determine which time function is to be selected. When switch #4 is closed the NORMAL function is operational. In NORMAL function, the relay is activated when the optical path is reflected and relaxed when the optical path is not. There is a time adjustment potentiometer located above the relay, adjacent to upper left terminal #1. Full counter clockwise rotation of this potentiometer corresponds to minimum (momentary) time

wiring diagram



Relay contact help: Relay contacts are used on most all of our Signaling Components. These are used since they are the most forgiving when incorrect wiring occurs and they provide for electrical isolation of the load to the circuit.

When the relay is relaxed the "C" Common terminal is connected to the "N/C" Normally Closed. When the relay is activated the "C" Common terminal is then connected to the "N/O" Normally Open terminal. The relays used on our circuitry contain Double contact sets indicated by section A and section B.

Remember - a relay is nothing more than an electrically activated switch!

setting. Rotating clockwise will increase the time setting to a maximum of about 60 seconds. With the OPTO-DT in NORMAL function, this time setting establishes a minimum on time for the relay i.e., when the optical beam is being reflected the relay is activated for the minimum time or for the duration of the reflection, whichever is LONGER. If "Jumper Selector" is off the TIMER function is selected. In TIMER function, when the optical path is reflected, the relay is activated for the set time period and then is relaxed. The relay WILL NOT ACTIVATE AGAIN until the optical path is no longer reflected which will allow the circuit to reset.

The output relay of the OPTO-DTR1 is of Double Pole Double Throw configuration with contacts rated at 5 Amps. There may be situations where you may desire to have additional relay contacts

available. At the left edge of the OPTO-DT board, just above the lower left terminal strip, there is an "expansion connector" on the board. This allows a second relay (Item #555) to be operated by the OPTO-DT. This 'piggy back' relay is furnished on a mounting board with terminal strips. To connect, merely plug the mating connector into the board end and connect the two small wires to the expansion relay board as directed. Other types of expansion relays can also be utilized and are shown in our catalog or web site.

When power is first applied to the OPTO-DT the relay will energize for the duration of the selected time cycle.