DEM DTR- 12X or 24X

Legal Limit High Isolation Dual Coaxial Relay

The DEM DTR is one of a series of High Power RF relays designed by Down East Microwave Inc. The purpose of this relay design is to allow the bypassing of Low Noise Amplifiers (LNA's) in high power amateur radio HF/VHF/UHF circuits. But, it may be utilized in other applications as the user sees fit. This relay design is based on two standard high voltage, and high current vacuum relays that have been selected for their insertion loss and isolation characteristics through the VHF/UHF RF region. This coupled with two additional isolation relays on the "by-pass ports" installed within the same enclosure makes this 4 port device the ideal relay for LNA's mast mounted or not in any amateur radio system 1.8 through 450 MHz.

The DTR utilizes mil-spec type "N" connectors for the two high power ports and standard connectors of BNC, SMA or type N for the bypassed ports, user specified. The DTR is available for either 12 or 24 VDC operation and is purposely designed to provide "straight through" operation with the voltages removed allowing the bypassing of any LNA in the system when the system is shut down. This is depicted in the schematic within this document.

The DTR is designed to tolerate higher powers and switching mishaps that standard mechanical coax relays will not. It will also switch and release faster than any standard RF mechanical relay (6 ms each way). The DTR is the ideal RF relay for any legal limit HF/VHF/UHF RF switching application requiring any type of by-pass mode. Specifications below are worst case and measured at 450 MHz. **The DTR is not recommended for use on 33 or 23 cm because the vacuum relays utilized exhibit poor insertion loss and lack adequate Isolation at those frequencies.**

Specifications @ 450 MHz.

TX INSERTION LOSS	TX RETURN LOSS	TX to RX PORT ISOLATION
<0.1dB	>30dB	>70dB

Instructions and Cautions

1. No voltage required for straight through operation during transmit. DC is applied for receive. To bypass LNA, remove DC power

2. The relay may be powered in a continuous service.

3. Use good quality RF cable for the desired frequency to maintain relay specifications.

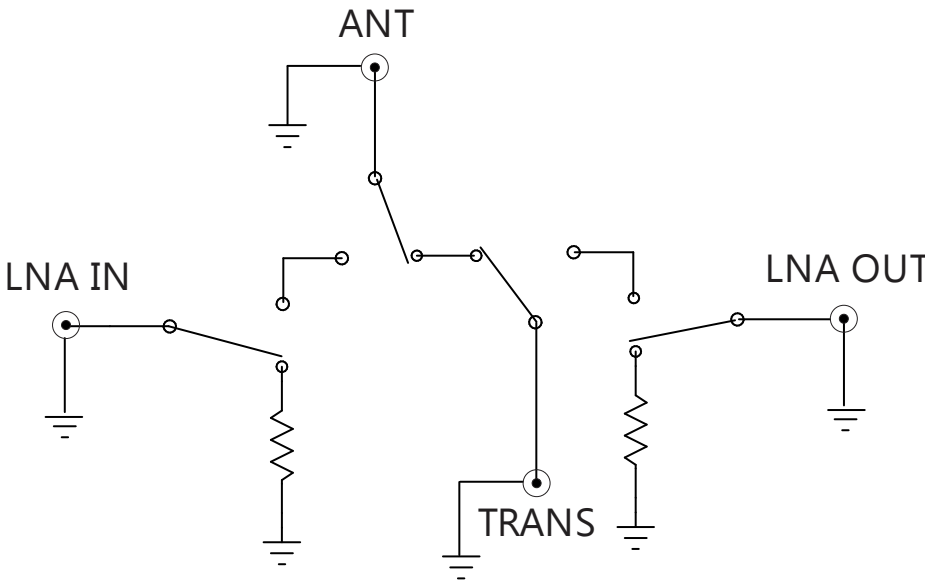
4. Operating Voltage is marked on all units within the part number, DTR -12 or DTR-24. Current draw is approximately 350mA for all versions.

5. If utilizing the DTR with a LNA, sequencing is recommended.

6. The DTR ports are symmetrical (See Schematic) and may be used in the reverse fashion if required for mounting purposes but it is recommended to keep labeling correct when installing to avoid mistakes.

7. Vacuum relays will resist contact arcing from lightning and improper keying with High power during transmit. Repeated instances may result in LNA damage and contact pitting and/or welding of the isolation relays. Be sure to utilize lightning protection and be sure to sequence the relay with your high power amplifier.

8. Bottom plate mounting holes are 4.30” center to center



Schematic shows relay in TX position, DC removed. All 4 relays fire at once during RX.

Secondary mounting holes are tapped for 4-40 x 5/16” and are spaced 1.50”. They are located on the ANT side of the relay.