2 x 8 Remote Antenna Switch

DXE-RR2X8B

DXE-RR2X8B-INS Revision 0c
Introduction

The **DXE-RR2X8B** is a dual 8-port switch designed to switch coaxial lines in low to medium-power RF systems typically used in a Single Operator - Two Radio (SO2R) environment.

The **DXE-RR2X8B** allows the user to switch inputs from either Master or Slave radio to two of the eight output ports using 1 of 8 logic inputs. The logic high required for switching is +12 Vdc at 100 mA. A switching time of less than 15 ms is normal.

The **DXE-RR2X8B** is intended to be interfaced with a customer supplied logical switching unit. The logical switching unit used should provide for protection against hot switching and to prevent attempts at the Master or Slave from selecting the same output port at the same time. The **DXE-RR2X8B** contains no internal logic or T/R switch sensing for transmit protection.

When selecting the various switch positions, the Master has precedence. This means if the Master selects output port #3, the Slave cannot use port #3 at the same time. Slave will then be transmitting to an open.

Another example would be if the Slave has selected port 5 and you are transmitting, and the Master then selects port 5, the Master takes port 5 and Slave will then be transmitting into an open.

Features

Enclosed relays provide exceptional performance and are moisture resistant. The **RR2X8B** can be used to simultaneously select multiple output ports as well as conventional one-of-eight antenna switching. This allows the **RR2X8B** to be used in complex antenna systems as well as traditional switching arrangements. Ports that are not selected are grounded.

The **RR2X8B** also uses removable screw terminals for the control cables. The removable plugs greatly simplify installation by eliminating the need for soldering. Disassembly is not required for control wiring access.

The **RR2X8B** also offers the following features:

- RF Shielded Weatherproof Housing - unique protection
- Excellent Port-to-Port Isolation; greater than 70 dB at 30 MHz, worst case.
- Ports not selected are grounded
- High-RF tolerant UHF connectors
- Enclosed 16-ampere RF relays
- Safe 12-volt relay operation
- 16 MOVs for surge protection on control lines
- 16 RF bypass capacitors
- Includes one **DXE-SSVC-2P** Stainless Steel V-Clamp for mounting
Specifications

**Power Rating:** 6 kW ICAS all modes, under 2:1 SWR, 4 kW CCS all modes, under 2:1 SWR

**Control Voltage:** +10-14 Vdc at 100 mA per port

**Port-to-Port Isolation:** >70 dB below 30 MHz, >60 dB below 60 MHz

**Ports Not Selected:** Are Grounded

**Loss:** <0.3 dBm below at 52 MHz

**Impedance:** 50 ohms

**Dimensions:** 10.375” x 9.875” x 4.375” and the mounting flange hangs down 2.25”

**Control Line:** Dual 8-wire line larger than #24 for runs up to 500 ft. (or 9-conductor for dedicated ground). When using 8-conductor wire the feedline serves as a ground return. Use of two DXE-CW9 CAT-5 or standard low voltage control wiring, such as telephone wire, is acceptable.

General Information

The **DXE-RR2X8B** uses a dual star arrangement of 24 relays to select one or more of eight output ports when voltage is applied from two 8-wire control lines.

The 24 relays provide greatly improved power handling, port-to-port isolation and SWR over conventional switches and allow connection between any of the eight antenna output ports from either the master or slave input ports.

The system offers virtually no loss at HF and excellent low-loss performance (less than 0.16 dB loss on six meters).

Installation

1. Secure the **RR2X8B** switching unit using the included DXE-SSVC-2P stainless steel V-Saddle Clamp. For outdoor installations or in moist environments, connectors must face downward. Use Never-Seez® or Anti-Seize on all stainless steel hardware to prevent galling.

2. Fasten all cables to the mounting mast or tower to relieve strain, and gently droop the cables to form a drip loop (do not use tight bends with coaxial cable). Install the **RR2X8B** with the connectors facing down and use gradual bends or loops in heavy wires. If the **RR2X8B** is mounted to a wooden pole or building, a wide copper flashing or heavy wire or strap should be connected from the mounting bracket to a good ground.
3. Wire the two plugs making a note of wire colors at each pin. Write them in the *Connector Wire Reference Table* below. Either "G" is ground.

The green connectors are in two parts and the tops part can be removed by pulling it straight off. This will allow easier wire replacement or servicing as needed. When pushing a connector back in place, ensure you press straight inward.

![Connector Image]

M = Master,  S = Slave

**DXE-CW9** Shielded CAT5 cable can be used. The shield is used as the signal ground return. Adhering to a logical standard allows people unfamiliar with a system to troubleshoot with minimal difficulty.

For **DXE-CW9** shielded CAT5 cable we suggest working your way up through the pairs by ascending color: brown, brown/white, orange, orange/white, green, green/white, blue, and blue/white.

| M = MASTER Connector Wire Reference Table |
|-----------------|---|---|---|---|---|---|---|---|---|
| G | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | G |
|    |   |   |   |   |   |   |   |   |   |

| S = SLAVE Connector Wire Reference Table |
|-----------------|---|---|---|---|---|---|---|---|---|
| G | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | G |
|    |   |   |   |   |   |   |   |   |   |

The ground wire can be omitted if the **DXE-EC-8** control console or the **DXE-CC-8A** control console or other switching voltage source is grounded to the feedline. The feedline shield and equipment grounds provide the ground path. **Note:** The total loop resistance of the control cable path must be under 30 ohms for reliable operation.

**Note:** Do not seal the connectors! The connectors are recessed inside a drip edge that prevents water from getting into connectors. The cover-to-connector plate junction is not sealed so the unit can "breathe" and eliminate condensation.
Control

The **DXE-RR2X8B** allows the user to switch inputs from either Master or Slave to the eight output ports using 1 of 8 logic inputs. The logic high required for switching is +12 Vdc.

When selecting the various switch positions, the Master has precedence. This means if the Master selects output port #3, the Slave cannot use port #3 at the same time. Slave will then be transmitting to an open.

Another example would be if the Slave has selected port 5 and you are transmitting, and the Master then selects port 5, the Master takes port 5 and Slave will then be transmitting into an open.

A very simplified schematic is shown:

Master selection always takes precedence. Master and Slave can never use the same output port at the same time (See notes above). (Ports not selected are grounded)

**Caution:** Never switch antennas while transmitting. Hot switching with power will create a sustained arc that damages relay contacts. When switching ports, allow 15 ms before transmitting to avoid damaging the switch. This type of damage is NOT covered under warranty.
Notes:
Optional Items

DXE-CW9S - Shielded Control Wire, 9 conductor stranded, per foot
DXE-CW9S is a high quality shielded outdoor cable. It features 9 #24 AWG stranded conductors with aluminum foil shielding plus a #24 stranded tinned copper drain wire. This gives you 8 switch positions plus common ground plus the separate shield. It has a gray PVC jacket. This cable is ideal for DX Engineering Remote Antenna Switches and Four Square arrays, and should be considered for any low-current custom remote switching application you have such as receiving antenna arrays. Order by the foot in the length you require. Price shown is per foot. A nice feature is the “rip cord”, which allows for easy stripping of the heavy jacket without worry about nicking or accidentally cutting the conductors.

DXE-CW9-1K - Shielded Control Wire, 9 conductor, 1000 ft reel
DXE-CW9 - Shielded Control Wire, 9 conductor, per foot
DXE-CW9-1K is a 1000 foot box of high quality shielded outdoor FTP (Foil Twisted Pair) Cat5e cable. It features 4 twisted pairs of 24 AWG solid wires with Al foil shielding plus a solid tinned copper drain wire - providing a total of 9 conductors for DC switching applications. It has a polyethylene jacket and is rated for direct burial. This cable is ideal for DX Engineering Remote Antenna Switches and Four Square arrays, and should be considered for any low-current custom remote switching application you have - such as receiving antenna arrays. A nice feature is the “rip cord”, which allows for easy stripping of the heavy jacket without worry about nicking or accidentally cutting the conductors. Excellent for use in all outdoor applications of switching, networking, data transfer and phone lines. As a data transfer line, it supports 10/100/1000Mbps.

PTX-81343, DXE-NSBT8 - Anti-Seize & Never-Seez
An Anti-seize compound MUST be used on any Stainless Steel nuts, bolts, clamps or other hardware to prevent galling and thread seizure. Any of these products can be used for this purpose.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>*PTX-81343</td>
<td>Anti-Seize, 1 oz. Squeeze Tube</td>
</tr>
<tr>
<td>*PTX-81464</td>
<td>Anti-Seize, 8.5 oz. Aerosol Can</td>
</tr>
<tr>
<td>*DXE-NSBT8</td>
<td>Never-Seez, 8 oz. Brush Top</td>
</tr>
<tr>
<td>*DXE-NMBT8</td>
<td>Never-Seez, 8 oz. Brush Top, Marine Grade</td>
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</tbody>
</table>

* These products are limited to domestic UPS Ground shipping only

SUM-900031 - Automatic Wire Stripper/Crimper/Cutter, 24-10 Ga.
Our DX Engineering wire stripper uses a spring-loaded design to make quick work of wires ranging from 24 to 10 gauge. Just insert the wire, squeeze the handle, and listen for the click. That’s the sound of another perfect wire stripping job performed in about 2 seconds - a fraction of the time it takes your pocket knife to do the same job. An adjustable wire length guide helps you make uniform strips, and a built-in wire cutter and crimper helps you complete your wiring job.

- Spring-loaded design
  - Strips wires ranging from 24 to 10 gauge
  - built-in wire cutter and crimper

KLE-11055 - Klein-Kurve Wire Stripper / Cutter 11055, 18-22 AWG
Klein Tools Klein-Kurve wire strippers are ideal for stripping solid (10-18 AWG) and stranded (12-20 AWG) wire cleanly and easily. The 7-1/8 in. strippers also have precise shear-type blades to cut copper wire nicely, easy-to-read markings on both sides, and extra-soft grips and curved handles for comfort.
Technical Support

If you have questions about this product, or if you experience difficulties during the installation, contact DX Engineering at (330) 572-3200. You can also e-mail us at:

DXEngineering@DXEngineering.com

For best service, please take a few minutes to review this manual before you call.

Warranty

All products manufactured by DX Engineering are warranted to be free from defects in material and workmanship for a period of one (1) year from date of shipment. DX Engineering’s sole obligation under these warranties shall be to issue credit, repair or replace any item or part thereof which is proved to be other than as warranted; no allowance shall be made for any labor charges of Buyer for replacement of parts, adjustment or repairs, or any other work, unless such charges are authorized in advance by DX Engineering. If DX Engineering’s products are claimed to be defective in material or workmanship, DX Engineering shall, upon prompt notice thereof, issue shipping instructions for return to DX Engineering (transportation-charges prepaid by Buyer). Every such claim for breach of these warranties shall be deemed to be waived by Buyer unless made in writing. The above warranties shall not extend to any products or parts thereof which have been subjected to any misuse or neglect, damaged by accident, rendered defective by reason of improper installation, damaged from severe weather including floods, or abnormal environmental conditions such as prolonged exposure to corrosives or power surges, or by the performance of repairs or alterations outside of our plant, and shall not apply to any goods or parts thereof furnished by Buyer or acquired from others at Buyer’s specifications. In addition, DX Engineering’s warranties do not extend to any equipment and parts manufactured by others except to the extent of the original manufacturer’s warranty to DX Engineering. The obligations under the foregoing warranties are limited to the precise terms thereof. These warranties provide exclusive remedies, expressly in lieu of all other remedies including claims for special or consequential damages. SELLER NEITHER MAKES NOR ASSUMES ANY OTHER WARRANTY WHATSOEVER, WHETHER EXPRESS, STATUTORY, OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS, AND NO PERSON IS AUTHORIZED TO ASSUME FOR DX ENGINEERING ANY OBIGATION OR LIABILITY NOT STRICTLY IN ACCORDANCE WITH THE FOREGOING.

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