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## **Eight Pak Antenna Switch and Smart Controller**

Thank you for purchasing our Eight Pak remote and smart antenna switch. This switch was designed for the amateur and commercial customer that requires high performance and reliability. It includes the following features:

- 8 antennas switched between 2 radios or versa vice to cover more bands and antennas.
- High Isolation between all ports means safe reliable operation without risk to radio front ends.
- Single 4-wire control cable, makes wiring easy and less costly.
- Inexpensive CAT-5 cable can be used for control cable.
- Multiple Eight Paks can be implemented in a network using the same control cable, making wiring up large installations an easy task
- Can be used stand-alone with the manual controller or control with PC via RS-232 or USB interface. Includes PC application to allow full configuration of multiple switches, and antenna selection assignments
- Includes mechanical and electronic lockouts so two radios will never be connected together
- RFI tight full metal enclosure, no plastic or cheap materials.
- Made in USA
- 3kW CW rated at 3:1 VSWR.
- Micro Strip traces, low VWSR to 55 MHz.
- All unused inputs are grounded.
- Lightning protection on all control lines at both ends of the cable, and spark gap on control lines as an added level of protection.
- Weather proof relay box.
- FCC and CE certified.
- Backed by the Array Solutions Lifetime Warranty!



## Installation

### Setting the Address Switches

Both the Controller and Relay units have a 6 position dip switch for setting the network address and other options. The 6 switches are SW1 thru SW6. The address of the Controller and Relay units must match for proper operation. Set the address using switches #1 to #5 and be sure to leave switch #6 in the off position. SW1 to SW5 are weighted 1-2-4-8-16. Units are shipped from the factory set for address #1 and if you only install one Eight Pak switch no further configuration is required. The below table shows switch settings for addresses 1 to 16. For addresses 17 thru 32 turn on SW5 and add 16 to the address in the table. All switches off is firmware programming mode and the units will not function correctly unless at least one switch is turned on.

ADDRESS	SW1	SW2	SW3	SW4	SW5
1	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF
5	ON	OFF	ON	OFF	OFF
6	OFF	ON	ON	OFF	OFF
7	ON	ON	ON	OFF	OFF
8	OFF	OFF	OFF	ON	OFF
9	ON	OFF	OFF	ON	OFF
10	OFF	ON	OFF	ON	OFF
11	ON	ON	OFF	ON	OFF
12	OFF	OFF	ON	ON	OFF
13	ON	OFF	ON	ON	OFF
14	OFF	ON	ON	ON	OFF
15	ON	ON	ON	ON	OFF
16	OFF	OFF	OFF	OFF	ON

### Wiring the units

A cable with at least 4 conductors is required (not supplied) to connect the Controller to the Relay unit. One recommended cable is CAT-5 network cable. This is an 8 conductor cable with 4 twisted pairs and is inexpensive and readily available. If using this type of cable, use one twisted pair for the A and B signals and the remaining 6 wires are divided evenly between the +12 and GND connections. Connections are made to the 4 position screw terminal connectors. The signal order from left to right is: +12 / B / A / GND. The Controller also requires a 12 volt DC power connection. Connect the power supply to the +12 and GND pins on the same connector as the control cable.

### Connecting Antennas

In order to provide the highest degree of isolation between antenna at a reasonable cost the Eight Pak antenna outputs are arranged as two groups of four each. The two groups are antennas 1 to 4 and antennas 5 to 8. It is recommended that antennas for adjacent bands be connected to separate groups for maximum isolation. As an example:

160m port 1  
80m port 5  
40m port 2  
20m port 6  
15m port 3  
10m port 7  
6m port 4

## **Initial Testing**

When power is first applied to the Controller you should see each LED briefly turn on in sequence. If this does not occur, double check your power supply and connections. After the LED test scan you may see the four corner LEDs blink. This is the "No Connection" condition indicating no communications with the Relay unit. If the Controller remains in this condition double check your control cable wiring and switch settings. If everything is working correctly the LEDs will indicate the currently selected antenna. The LEDs are controlled by the Relay unit, not the rotary switches, so a short delay between selecting an antenna and the LEDs updating is normal.

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## **Operation**

### **Manual Control**

In Basic mode antennas are selected by the rotary switches on the Controller unit. Switch positions 1 thru 8 correspond to antennas 1 thru 8. Remember that the indicator LEDs are controlled from the Relay unit so a small delay in the LEDs updating is normal. Provisions are included to prevent both radios from accessing the same antenna at the same time. If both switches are set to the same position the radio that selected that antenna first will keep it and the LED for the other radio will blink indicating a conflict.

### **Computer Control**

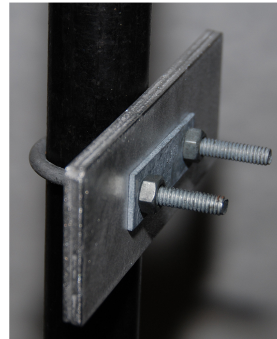
The Eight Pak may also be controlled directly from a computer. Computer control allows antennas to be selected by band instead of antenna thus greatly simplifying antenna selection. Our Eight Pak software is recommended for those with 8 or fewer antennas and do not want automated operation. For those with more than Eight Pak antennas or desiring automatic band selection we recommend our AntennaMax software which supports multiple Eight Pak switches and can select up to Eight Pak antennas per band. It also allows multiple antennas to be selected at the same time.

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## Eight Pak Mounting



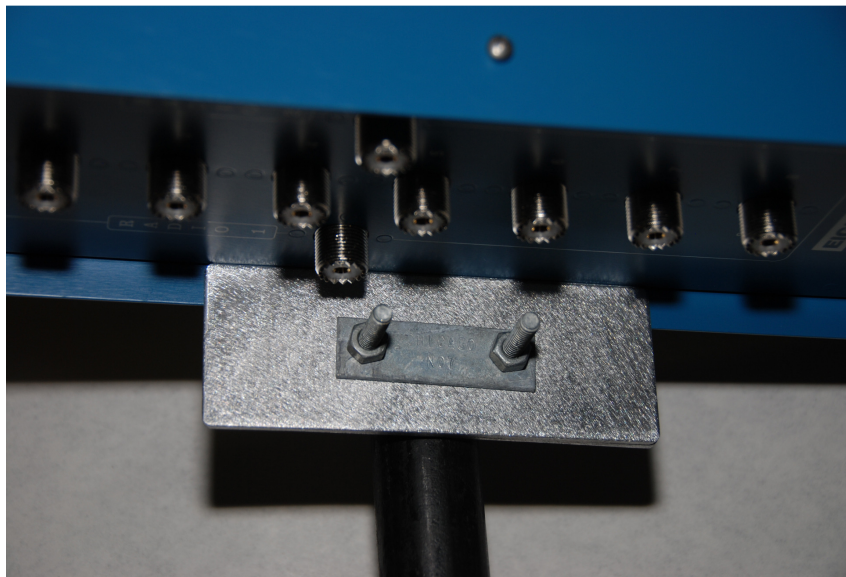
We have designed a very simple bracket that allows mounting to a tower leg or other pipe. It is constructed of two plates, and one U-bolt as shown here.



To mount it on your tower, remove the two nuts from the U-bolt, and position it on your tower leg at the point where you want the 8-pak to be placed. Leave the nuts loose enough to fit the bottom edge of separate the two plates a bit to fit the side of the 8-pak chassis.



Position the 8-pak between the two plates, tighten the two nuts and the 8-pak should be in place.



# Eight Pak Software

## Introduction

The Eight Pak software provides the ability to configure and control any number of Eight Pak switches via a single USB or COM port. It allows you to map each band to an antenna or in the case of multi-band antennas, multiple bands may be mapped to the same antenna. Only one Controller unit is required to control multiple Relay units via software.

## Communications

The communications type is set to USB by default. To change to RS-232 you must remove the cover from the Control unit and move the two push-on jumpers to the RS-232 position. The next step is to select the desired COM port. In the case of USB, it is recommended that you unplug the USB cable from the Controller, wait a few seconds, plug the cable back in and make a note which COM port is added to the port list. This will be the proper port for the USB interface. The Comm indicator in the main window will turn green when you select the right port and everything is connected, powered up and working correctly.

## Configuring the Eight Pak

All configuration data is contained in the Relay units and only a single Controller unit is required even if you have installed multiple Relay units. Click on the Configure button to begin the configuration process. Next select the address of the unit to be configured and wait for both the Comm and Switch indicators to turn green. If either indicator remains red check the COM port and address selections. If both indicators are green the next step is to click on the Reload Data button to retrieve the current configuration from the Relay unit. You should see the message "Configuration received". If this message does not appear after a few seconds click on the Reload Data button again. You are now ready to enter the desired band to antenna mapping. For each band select the desired antenna number. More than one band may use the same antenna. If you have no antenna for a band, such as 60M, set the antenna selection to 0. Click on the Update Switch button when finished to write the configuration to the Relay unit. After a few seconds you should see the message "Configuration updated". If not, click on the Update Switch button again. Click on the Operate button when finished.

## Operation

It is recommended to use Address 0 during normal operation as this will send system wide broadcast commands to all Relay units in your system. You may select an address to use but keep in mind this will send commands to only the Relay unit with that address. This may be done when using a single Relay unit or for testing a single unit in a large system. Simply select the desired bands for each radio and the proper antenna will automatically be selected for you. Much simpler than trying to remember which switch position to use for each band. The software contains a lockout feature which will prevent receiver damage which can occur if both radios are on the same band with antennas connected.

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