**Array Solutions**
2611 N. Belt Line Rd, Suite 109
Sunnyvale, TX 75182
www.arraysolutions.com
phone 214 954 7140
e-mail sales@arraysolutions.com

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ARRAY SOLUTIONS

New! 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.
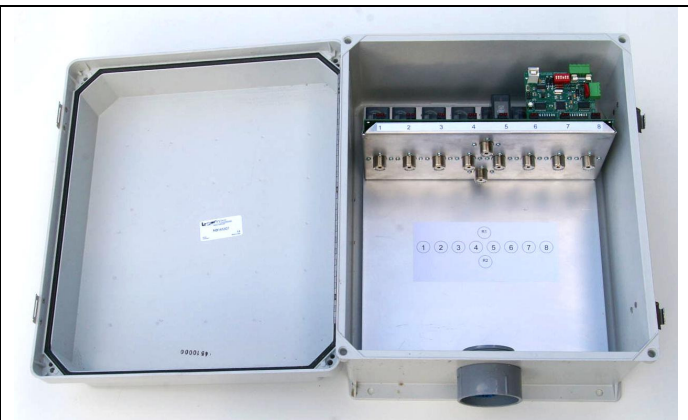
The 8-pak includes the following features:

o   8 antennas switched between 2 radios
o   High Isolation between all ports means safe reliable operation without risk to radio front ends.
o   Single 4-wire control cable, makes wiring easy and minimizes expense.
o   Inexpensive CAT-5 cable can be used for control cable.
o   Can be used stand-alone with the manual controller or control with PC via RS-232 or USB interface. Control software can be downloaded from our web page.
o   Includes mechanical and electronic lockouts so two radios will never be connected together
o   Made in USA
o   3kW CW rated at 3:1 VSWR.
o   Micro Strip traces, low VWSR to 55 MHz.
o   All unused inputs are grounded.
o   Weather proof relay box.
o   Backed by the Array Solutions Lifetime Warranty!

Installation

Network Address

   The first step is to set the address of the switch. The factory setting is switch #1. If you have only a single 8-pak or 4x8-pak switch in your system you may use the factory default setting. DIP switches 1 thru 4 are weighted 1,2,4,8. The address is determined by adding the numbers for each switch in the On position. For example. if you have switches 1 and 3 on the address would be #5. Switches 5 and 6 should be in the Off position. The photo at the right shows address #1 selected. If you plan to only control the switch manually with one of our Manual Controllers there is no need to continue to the configuration process; however, if you plan to control the switch from our BandMaster Band Decoder or using software you will need to complete either the Basic mode or Expanded mode configuration steps below.
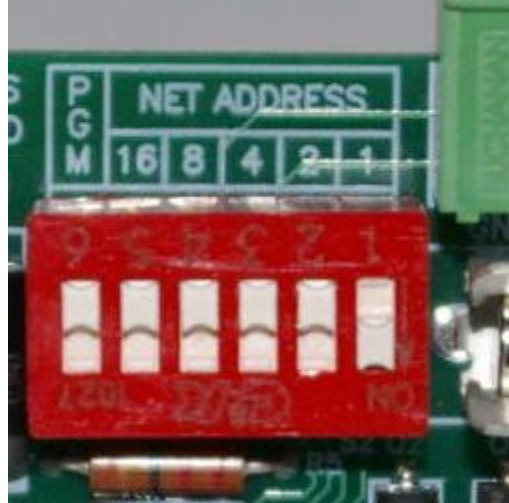
Manual Controller

   If you purchased a manual controller for your switch you will need to set the address to match the one you selected in the switch. Factory default is #1. DIP switches 1 thru 4 are used to set the address. Switches 5 and 6 should remain in the Off position (down). This is the only step required to set up the Manual Controller. The center 4 LEDs will blink if there is no connection to the switch. If this occurs for more than a few seconds, verify your connections to the network connector and the address is the same as the switch. The LEDs on the Manual Controller are controlled from the remote switch, not the knobs on the controller, and indicate the actual antennas selected so a slight delay in the LEDs after changing antenna selection is normal.
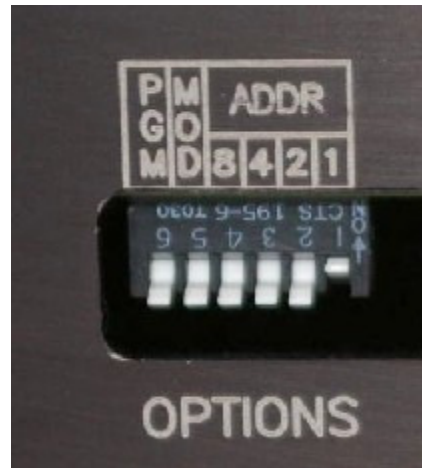
Wiring the units

   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	15m	port 3
40m	port 2	10m	port 7
20m	port 6	6m	port 4

The bottom of the new 8-pak cabinet is fitted with two large PVC fittings to allow easy entry of your coaxial and control cables. The fittings are installed inside the cabinet for shipping only. Please move them to the outside of the cabinet as shown in the photos below. You may cut or drill additional holes in the cabinet as you wish, but keep in mind that the cabinet is fiberglas and has the normal "itch-factor" associated with that material. Keep the holes on the bottom of the cabinet so that water cannot get in from above.

If you have "critters", you may want to block up the remaining space between the cables with expanding foam or some other material. This is entirely up to you.

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 LED updating is normal.

Operation

Band Decoder Control

The most elegant solution is to use one of our Bandmaster band decoders for each radio interfaced with the 8-pak so that as you change bands with your radio, the correct antenna is selected. The Bandmaster is a very sophisticated and powerful device. It can control your 8-pak along with bandpass filters like our FilterMax unit as well as any other switching you might need to do that requires sourcing or sinking drivers. Check on the Array Solutions web page or give us a call for more details.

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.

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 short delay of the corresponding LED illuminating on the controller 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.

Manual control is accomplished through either a dual controller which has one knob for each radio on a single console or a single knob controller located at each radio. A dual controller is perfect for SO2R or for side-by-side multi-2 or multi-single stations. For those with two stations not next to each other, or in different rooms, you may want to use individual controls at each position.

Note: we used to offer two dual controllers for this purpose, but that configuration is no longer supported – or necessary. More details about the controllers is in the next section.

Dual and Single controllers

We now offer both the dual controller as well as single knob controllers for the 8-pak. Both knobs have an "EXT" position which is selected if you are using computer control or using a Bandmaster Band Decoder.	
The single controller comes in two versions. The standard unit is half of a dual controller. The "Integrated" switch controller includes a band decoder that provides control of the 8-pak and FilterMax compatibly bandpass filter. Note: the Integrated Switch Controller does not include the capability to sink or source to other devices.	

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Eight Pak Mounting

The new 8-pak enclosure has flanges at the top and bottom that allow mounting to any flat surface.

(You can remove the two PVC fittings from the bottom of the cabinet while installing your 8-pak.)


Tower Leg Mounting

We have designed a very simple bracket that allows mounting to a tower leg or other pipe. It is constructed of two aluminum plates, and one U-bolt as shown here. Two of these brackets are required (one on top and one on the bottom) to secure your 8-pak to a tower leg or pipe. These are available from our web page.

To mount the brackets on your tower (or pipe), remove the two nuts from the U-bolts, and position them on your tower leg at the point where you want the 8-pak to be placed. Leave the nuts loose enough to separate the two plates a bit to fit the top and bottom flanges of the 8 pak cabinet.
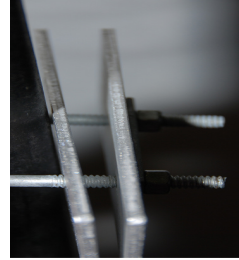
Position the 8-pak between the two bracket plates, tighten the u-bolt nuts and the 8-pak should be held in place securely.

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 stop 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 the 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 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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