TA Wireless Base Station
Trinculo's Attic Spec Sheet

The Trinculo's Attic Wireless Base Station allows for DMX control of up to 16 remote TA devices, such as the Capulet (wireless DC dimmer), from up to 100' away. The Base Station serves as a wireless communication node, receiving DMX from a control console and transmitting it to the remote devices, allowing for control of all devices from a single console.

Characteristics

Size: 3.25" x 3.25" x 1.75" (outer case dimensions)

Weight: 4 oz.

Connectors:
- (1) 2.1 x 5.5mm center positive barrel jack for power input
- (2) RJ45 connectors for DMX communication. B- is on Pin 1, A+ is on Pin 2. Ground is connected to Pins 7 & 8.

User Interface:
- (1) block of 9 DIP switches, to set the DMX start address
- (1) block of 2 DIP switches, to toggle additional options
- (1) slide switch to toggle DMX termination

Wireless: 2.4GHz/50mW Xbee radio w/wire antenna, operating in 802.15.4 mode

Range: 100' line-of-sight to remote devices

Power

Power input consists of a single 2.1x5.5mm center positive barrel jack, with a maximum voltage input of 9VDC. Minimum input voltage is 5V.

DMX Addressing:

The Base Station has two blocks of DIP switches: a block of 9 DIP switches to set the DMX start address for the device, and a block of 2 DIP switches to set additional options.

The DMX start address can be set from 1 to 512 and is set in binary, with the least significant bit at position 1. With all switches OFF, the start address is set to 1; with all switches ON, the start address is set to 512. Starting with all switches OFF, turning on each switch adds the binary digit to the start address:

Switch	Decimal Addition
1	+1
2	+2
3	+4
4	+8
5	+16
6	+32
7	+64
8	+128
9	+256

Setting the address is not hard, but it does require a little math. There are smartphone apps that will assist with this, but you can also do it with a little arithmetic.

Say you want to set the start address to 300. First you subtract 1 (the "base address") from 300, and get 299. Then you look at the chart of decimal numbers and find the largest number that is smaller than 299, which is 256 (Switch 9), so you set Switch 9 ON. You then subtract 256 from 299, getting 43. You repeat this operation, finding the largest number that's smaller than 43, which is 32, so you set Switch 6 ON. Subtracting 32 from 43 gives you 11. Repeating this operation gets you 8, which is Switch 4. 11-8 is 3, which gives you Switch 2 ON, 3-2 is 1, which gives you Switch 1 ON. To check our math, we have switches 1, 2, 4, 6 and 9 ON:

$$1 \text{ (Base address)} + 1 + 2 + 8 + 32 + 256 = 300.$$

Switch positions can be changed while the device is on, but the address changes will not take effect until the device is turned off and back on again.

Configuration Options

Number of channels

By default, the base station transmits 96 channels, which is enough for 16 remote devices. You can change this to 192 channels in two groups, which will control 32 remote packs. On the switch bank with 2 DIP switches, Switch 1 controls this behavior: when OFF, the base station transmits only one group of 96 channels; when ON, the base station transmits two groups of 96 channels, for a total of 192.

Please Note: Because transmitting 192 channels requires a larger amount of data, there is an increased chance of remote packs not getting data, or "hanging" with old data. If occasional hanging is unacceptable in your application, it is advisable to use the default 96-channel setting.

The second switch on this switch bank is not currently in use and should be left in the ON position.

DMX termination

DMX termination is controlled by the small slide switch adjacent to the connectors. When the switch is slid towards the connectors, DMX is terminated. When the switch is slid away from them, DMX is unterminated. If you are not using the pass-through port, it is recommended that you keep the DMX link terminated.

Switch positions can be changed while the device is on, but changes to the number of channels will not take effect until the device is turned off and back on again. DMX termination happens immediately.

Wireless Operation

The Base Station uses a 2.4GHz/50mW Xbee radio operating in 802.15.4 mode to communicate with its remote devices. The radios in the Base Station and all devices communicating with it need to be configured with the same PAN ID, which is randomly assigned and printed on a label attached to each Xbee. If you are purchasing a remote device at the same time as a Base Station, we will automatically set them to the same PAN ID; if you already have a Base Station and are purchasing devices to use with it, please include your PAN ID with your order.

When a remote device goes out of range, it will freeze at the last known values until it gets a new valid data packet. Near going out of range, this tends to look like slow data updates/slow frame rate as some data, but not all, will get through.

To maximize range and minimize interference:

- Place the base station as close to the remotes as possible. 100' range should be easily achievable, but the closer the better. If you can practically and safely hang the base station upside down above the stage, do it.
- Arrange the remote device so that the side with the dimmer # label is out in the open, and attempt to minimize or remove any wires crossing the device; route wires around the device whenever possible.
- Do not place any walls or structures between the base station and the remotes.

The base station operates solely in broadcast mode, transmitting packets as quickly as it can.

Please note: the standard base station is approved only for use in North America. European and Asian versions are available, and simply require a change to the XBee radio.   European & Asian versions may have reduced range due to lower power radios.

Accessories

The Wireless Base Station is intended for use with all Trinculo's Attic remote wireless devices. This currently includes the Capulet (wireless DC dimmer), with plans for wireless ringing/vibrating cell phones and other remote devices in the works.

Custom Versions

Custom versions of the Base Station include:

- MIDI control
- Simple pushbutton/slider control
- Case with flanges for wall mounting
- C-clamp and yoke

There are many other possibilities for customization, so if you have something you'd like to try, give us a call!