RC4*Magic*
Series 2

Wireless Dimming – User Manual Addendum for Dimmer f/w 1.302 and Later

Summary

All models of RC4Magic Series 2 dimmers with firmware version 1.302 or later now provide 4 selectable dimmer curves, rather than the 3 curves described in RC4Magic User Manual R1.0. Thus, some information on pages 12 and 15 of the manual is no longer correct.

Also, pulse-width-modulation frequencies have changed. Thus, some information on page 17 of the manual is no longer correct.

Dimmer Curves

When setting dimmer channels and curves, channel level ranges provide the following curves:

Dimmer Curve	Level Percentage	Level Dec (0-255)	Level in Hex (0-FF)
Non-Dim	100% (80% or higher)	255 (205 or higher)	0xFF (0xCD or higher)
Linear (no smoothing)	70% (60% - 79%)	180 (154-204)	0xB4 (0x9A-0xCC)
ISL Fast Smoothing	50% (40% - 59%)	128 (103-153)	0x80 (0x67-0x99)
ISL Slow Smoothing	30% (20% - 30%)	77 (52-102)	0x4D (0x34-0x66)
Channel Ignored	Less than 12%	Less than 32	Less than 0x20

Use **ISL Slow** for large, high-power LED devices to reduce stepping during fades. This curve mimics the filament persistence of a large incandescent lamp, which takes a significant period of time to rise and fall when power levels change.

Use **ISL Fast** for smaller LED devices. This curve mimics smaller filament persistence for a quick smoothing effect.

Linear is ideal for incandescent loads, including halogen MR16s and MR11s.

Non-Dim is intended for use with relays, solenoids, air brakes, and other on/off devices. Hysteresis ensures there will be no noise or oscillation, even if the source DMX level is slowly changing or is noisy. The DMX level must rise above 54% (dec 138, hex 0x8A) to turn on. Then, the level must fall below 46% (dec 117, hex 0x75) to turn off.

No smoothing is incorporated into the linear and non-dim curves. Use these curves for fastest possible response, including strobe and blink effects.

PWM Specifications

All dimmer curves provide 14-bit digital resolution (16,384 steps).

When all available output channels (dimmers) are set for the linear curve, the PWM frequency is 92Hz. This low frequency provides greater efficiency than high frequency switching, reducing heating in the output circuitry and allowing larger loads to be used before thermal shutdown occurs. Higher efficiency provides longer battery life – a very important consideration for wireless dimming. Although a quiet but audible filament buzz can sometimes be heard from incandescent lamps modulated at 92Hz, this sound is comparable to what is heard from traditional high-voltage AC fixtures with 50/60Hz chopped-wave dimming.

If any channel is configured for an inverse-square-law (ISL) curve, the PWM frequency is increased to 738Hz. This eliminates visible flicker with LEDs and ensures there will be no beating with video frame rates. This higher frequency can be audible with incandescent lamps, and is intended only for use with LEDs and other silent solid-state devices.

Because LEDs have no inherent filament persistence and respond very quickly to changes in power level, visible stepping during fades can be visible, particularly when viewed peripherally. This phenomenon can be reduced with smoothing techniques and higher step resolutions.

RC4Magic Series 2 smoothing, either slow or fast, makes use of the high-resolution of RC4Magic dimmers by gliding through in-between steps. Although single DMX channels provide a range of only 256 steps (0 – 255), having a much higher output resolution also ensures higher accuracy at the bottom of the ISL curve where changes in power level must be very small.

The slow ISL curve provides a long glide time to emulate the filament persistence of a large incandescent lamp. The fast ISL curve uses a shorter glide time more reminiscent of an MR16 lamp. In general, large LED light sources, including arrays of many emitters, will look more pleasing with the slow ISL response. Smaller sources will look better with the fast ISL response.

When audible noise is a concern, use the linear curve.