

Which Remote Control Extender Do I Use?

Introduction:

If you are thinking of building a remote control extender circuit then you may be unsure of which circuit to use. This article points out the differences between the circuits, which should help you make the right choice.

Mark 1:

Pros:

The Mark 1 version will work with any Infra Red (IR) remote control equipment. Will also work with faster modulated (115KHz) satellite decoders but subject to the limitations below.

Cons:

There is no filtering between the received signal and the photo-diode, which makes the circuit susceptible to noise and interference from fluorescent lighting and other noise sources. Due to a compromise between noise pickup and gain, the sensitivity from remote control to the photo-diode is less than 1 metre. Careful must be taken to position the photocell away from all light sources, including strong sunlight.

Mark 2:

Pros:

The photo diode has been replaced by an IR module. High immunity from fluorescent lighting and increased range from remote control to the circuit in excess of 5 metres.

Cons:

Relies on the small residual carrier present from the IR decoder to re-transmit the pulse. This circuit works best with older equipment (pre 1995) as no modulated carrier is added to the decoded signal. May not work on modern apparatus.

Mark 3:

Pros:

All the advantages of the Mark 2 including generating a modulated 38KHz carrier. Uses the same components as the Mark 2 circuit plus a few additional parts.

Cons:

The final pulse is inverted and some equipment may require "fine tuning" to work. Will not work with faster modulated appliances.

Mark 4:

Pros:

As with Mark 3 but also has an adjustment to fine tune the modulated output. No inversion of the final pulse.

Cons:

Will not work with faster modulated appliances.

What is my remotes modulation frequency?

There is no easy way to tell, but the vast majority of IR remote controlled appliances use 36-38KHz. If you have access to either a digital counter or an oscilloscope then use [this circuit](#) to measure the modulation frequency.

Final Words:

The Mark 3 or Mark 4 version are currently the best choice for compatibility. The Mark 3 and 4 circuits re-introduce a strong modulated IR carrier, which has a better chance of being decoded than the Mark 2 version, which relies on a residual and weak carrier. The Mark 1 circuit is currently the only version that will work with IR remotes modulated at 115KHz and above, however it is prone to interference from ambient sunlight and fluorescent sources.