

MASTER / SLAVE
AC POWER CONTROLLER

Revised 19 August 2019

INTRODUCTION

Most modern flat-screen TV sets require a separate sound system for high quality audio to complement the high quality video now available at an affordable price. It would be nice to be able to turn both the TV and the sound system on and off at the same time by pushing only one button on only one remote control.

Although all the components to build a device to do this are readily available, no ready-made product could be found for sale. Maybe I missed one somewhere?

This revised version uses two turns of wire through the Dwyer current sensing switch to provide for operation with a lower power device as Master.

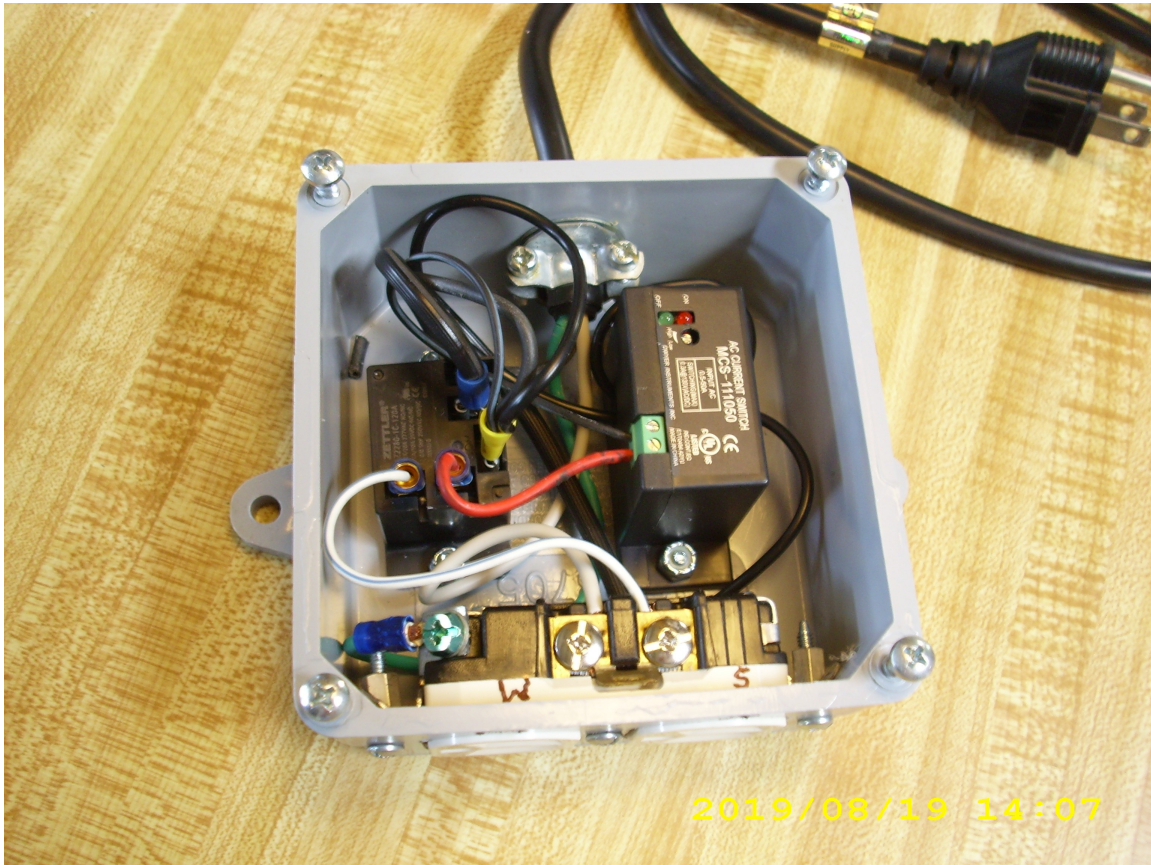
DESIGN

The heart of this controller is the AC Current sensing switch which operates a separate relay whenever the current (to the TV) being sensed rises above an adjustable preset amount. Thus the TV remote control function can remain powered without tripping the relay, but fully turning on the TV will trip the relay and apply power to the sound system and any additional accessories.

Details are provided in the following pages. Everything is contained within a 4" by 4" by 2" plastic "Junction Box" as shown below. The cover is not shown for clarity.



JIM KANESS SYSTEMS ENGINEERING
4267 Varsity St., Ventura, CA 93003



MASTER SLAVE CONTROLLER PARTS LIST

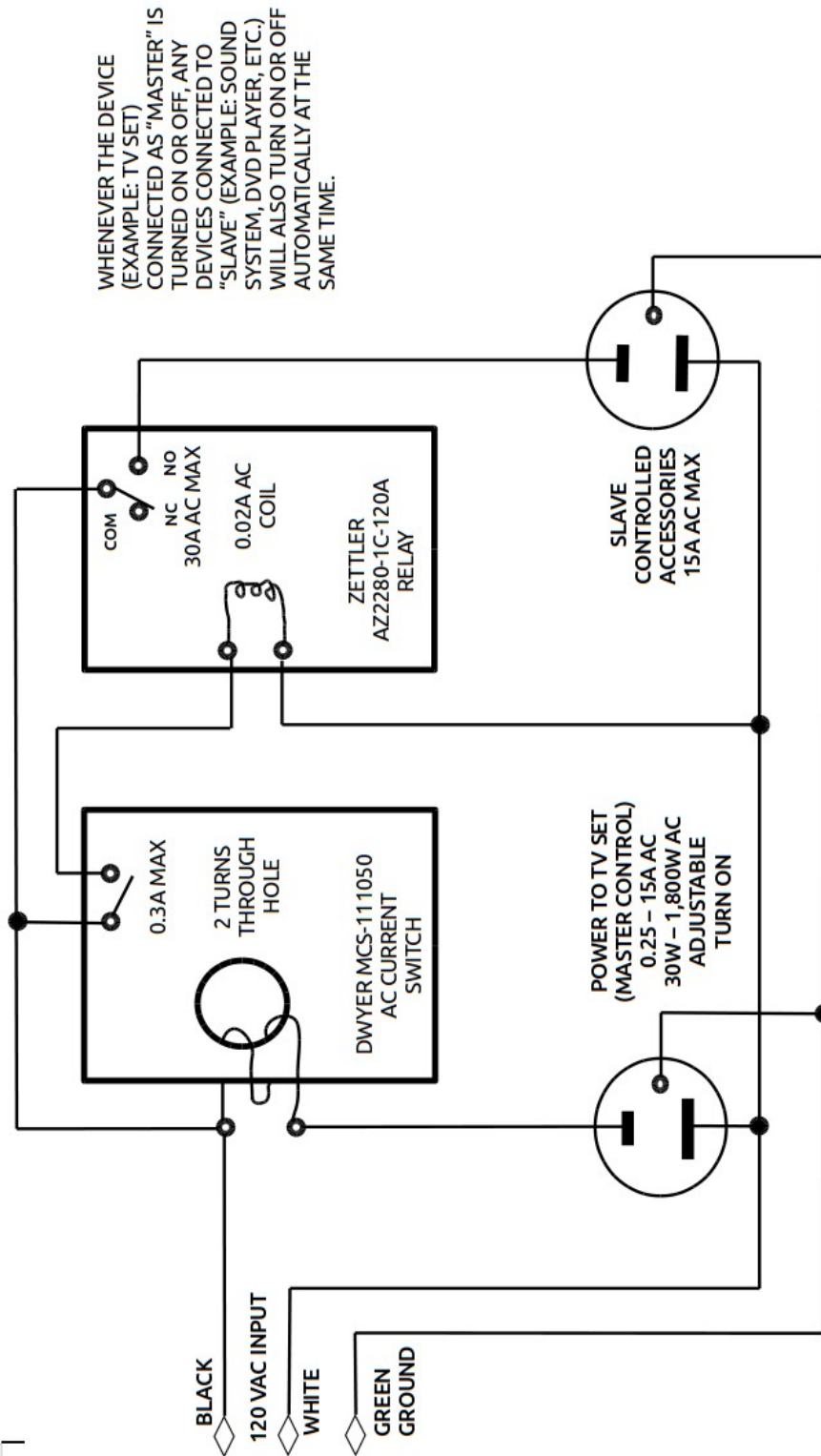
ITEM	MAKER	MODEL	COST
4X4X2 BOX	CANTEX	5133705	\$8
CURRENT SWITCH	DWYER	MCS-111050	\$25
AC RELAY	ZETTLER	AZ2280-1C-120A	\$10
AC POWER CORD	16 Gauge, 3-wire		\$5
1/2" CORD CLAMP	Various		\$1
AC DUPLEX OUTLET	Various		\$3
MISC HARDWARE	Various		\$6
TOTAL PARTS			\$58

CONSTRUCTION NOTES - REVISED

1. The duplex AC outlet was modified by breaking off the metal strap between the two "hot" (narrow blade, black wire) terminals so the two outlets can be powered independently. Most duplex outlets will provide for this.
2. The duplex AC outlet is bolted on with three 6-32 bolts. Because of the 45-degree angles at the inside corners of the junction box, the two outer bolts are held by "nuts" consisting of short lengths of 6-32 aluminum standoffs, each cut at a 45-degree angle on one end.
3. The Cantex junction box listed (purchased from Lowe's) is sturdy, attractive and very easy to drill. Use a sharp drill bit and a slow drill speed when drilling any plastic to avoid melting the plastic.
4. The 1/2" AC cord clamp is mounted backwards to the usual manner for a neater appearance outside the box. The cord was wrapped with ten turns of black electrical tape where it is clamped for a more secure clamp.
5. The 16-gauge power cord was stripped of its outer insulation 6-inches from the end, providing plenty of wire to reach everything.
6. Other wires that power the outlets are also 16 gauge to match the power cord.
7. The Dwyer current switch has an adjustment for how much current it takes to activate the relay. Using a jeweler's screwdriver, adjust it so the TV or other device plugged into the Master socket reliably trips the relay when turned on and reliably does not trip the relay when turned off. In my own application, the green LED on the Dwyer relay never lights but the red LED does accurately light when the relay is ON.
8. The Dwyer current switch will be safe with up to 25 amps AC drawn from the Master AC outlet. The Zettler relay will safely handle up to 30 amps AC drawn from the Slave outlet. But, both outlets are only rated for up to 15 amps AC each. The short lengths of 16-gauge stranded wire should be safe with 15 amps AC or less.
9. The Zettler relay offers 0.187" male blades for the coil connections and 0.250" male blades for the relay contacts. Most hardware and auto parts stores can supply the mating female connectors.

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DESIGN PLAN, REVISED
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