Subject: Firmware
Posted by audioaudio90 on Fri, 23 Sep 2011 17:44:54 GMT
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My cable company apparently sent a new software patch to the cable box. Whatever they did, I wish they would take it back; since then I've had nothing but problems. My DVR doesn't always record properly and I find myself constantly rebooting the box because it won't work when I turn my TV on.

Subject: Re: Firmware
Posted by Wayne Parham on Fri, 23 Sep 2011 17:59:32 GMT
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I hate when updates make a product wonky. I know the developers and QA teams are usually meticulous about testing new releases, because I work in that world too. Made an eReader recently, working on a preamp remote control right now. But with all the environments these kinds of devices are used in, sometimes they don't catch something. When that happens, you can brick a device and the customers are understandably pissed.

The worst thing, in my opinion, is actually the opposite problem. In a rush to get products to market, there is a tendency these days to ship a device with known issues, under an assumption that it will automatically update on first-use. You often write code that looks for updates on power-up and at regular intervals. But I think it's a really bad idea to assume the device will auto-update on first use, because not all customers will be connected to the internet. In that case, they're running the buggy shrink-wrapped firmware, sometimes indefinitely.

Subject: Re: Firmware
Posted by gofar99 on Sun, 25 Sep 2011 15:55:18 GMT
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Hi, I agree, I hate it when they fix a problem I didn't have. PC companies are the same. The latest batch of fixes for NVIDIA ethernet cards from Microsoft crashed all three of my PCs and I had to revert to the earlier drivers and reconfigure all the network hardware.

Wayne, About the remote you are working on.....I got a IR remote control audio "passive preamp" a few months ago and finally put it to use. All digital switching with Japanese relays and 1% Japanese resistors. 80 steps and 6 inputs. All it takes is 12 VAC at about 100ma. Complete with digital display. As I recall it was about $110 from Hong Kong. Works perfect and is quite transparent. I could not source the parts for anywhere near the price. An option was US made precision resistors for about $30 more. Really a good deal if you don't want to roll your own preamp. As a designer I hate to say it, but I like it. The biggest issue is that the main board with

the display is just under 12 inches long and 2.5 tall. It means you can't put it in a small case.

Subject: Re: Firmware
Posted by Wayne Parham on Sun, 25 Sep 2011 21:23:47 GMT
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Yeah, mine uses an Analog Devices part to do the attenuation. The chips are inexpensive and I think I did a pretty good job coding it. Used an actual logarithmic sequence rather than an approximation for the audio taper. The remote can be any generic universal. So I think it should be a pretty good deal for DIY amp kit companies like yours and Uriah's. We'll kick it around some over the next few months if you want.

Subject: Re: Firmware
Posted by Wayne Parham on Mon, 26 Sep 2011 21:03:18 GMT
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Subject: Re: Firmware
Posted by gofar99 on Mon, 26 Sep 2011 22:28:48 GMT
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Where are the women that usually go with that ad? Please ladies, don't pounce on me. I personally think the original ad is in somewhat questionable taste.

I have some of the AD264s. I considered them for a project about a year ago but never got around to it. Please let us all know when you get yours up and running. I may have some from Dallas Semi as well.

Subject: Re: Firmware
Posted by Wayne Parham on Tue, 27 Sep 2011 15:01:42 GMT
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I have the prototype finished. Sent an early version to Uriah a couple weeks ago, but it was more of a proof-of-concept. The coding at that time drove a parallel output, like what you'd use to drive

a DAC. The one I have now uses an SPI interface, supported by several digipots. I've been testing with the AD5206 device.

Other compatible digipot chips would have an SPI interface, 256-bit resolution and linear taper. The firmware sends a logarithmic sequence, so a linear digipot is needed. That's much more common than audio taper digipots, and the logarithmic sequence is more accurate anyway. I've never seen a "log" taper pot that was anywhere close, most are crude approximations.

The firmware runs on an AT2313 processor. I can send you one that's preprogrammed and you can hook it up. It's a cinch.

It reads IR codes sent from a universal remote (set to code 0380). Most will control three devices (like TV, cable and DVR) with one remote, but I like to set all three to code 0380 so I don't accentally change it to a mode that doesn't work. Seems like every time that happens I think the batteries are dead, then replace them only to realize the cat selected the device setting I didn't program. So I usually set all three modes to code 0380, so no matter what device is chosen, the buttons work for my stereo preamp controller.

I prefer the universal remotes with the up/down/left/right controls arranged in a circle. That way volume is up/down, and balance is left/right. It's an intuitive interface. The center button toggles locking the channels together, in case you don't want to set left/right channels separately. If they're already panned to one side or the other, then both channels are set to the average value, the "middle" level. When channels are locked, only up/down work. Toggle it to set that mode on or off.

The "power" button selects power on/off. Buttons one through five select the corresponding input channel. Pressing "input" or "select" will also select channels in a round-robin fashion, incrementing the channel each time it's pushed. The "mute" button sets volume to zero first time it's pressed, then back to normal volume the next time.

When the processor is powered up, the remote is monitored and digipots can be modified. But input selectors can't until "power" is pressed. This turns on the power pin (5V, 40mA max), which can be used to drive a relay and LED. Once power is on, the channel selection can be made as well. It is initially set to channel one, and the corresponding pin is set (again, 5V, 40mA). If another channel is selected, the channel one pin turns off, and the other selected channel pin turns on. When power is tuned off, all channel pins go off.

The digipot and channel selections are volatile, meaning the settings are lost if processor power is removed. However, it is assumed that power to the processor chip will always be applied (so it can listen to the remote for commands). Power to the preamp circuits can be switched by the power relay, but power to the processor should always be present.

When power is first applied to the processor, it sets the digipots to zero (lowest volume) and sets channel to one. However, until "power" is pressed, the channel select pins are off. Once power is pressed, the channel one pin turns on and channel selection can be changed, as described above.

I'd probably drive a 2N2222 from the processor pins to provide a relay signal. An LED can also be

safely connected, but current should probably be limited to about 20mA. The maximum rating is 40mA per output pin, but I'd probably keep 'em down under 20mA.

Finally, there are input pins provided to sense front-panel buttons. That way the device can be controlled without the remote control. There are pins for power, up, down, left, right and (channel) select. These are all selected by connection to ground. There's an internal pullup resistor, so no other components are necessary - just an SPST pushbutton to ground.

Subject: Re: Firmware
Posted by gofar99 on Tue, 27 Sep 2011 16:32:54 GMT
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Hi Wayne, Sounds great.

The digipot and channel selections are volatile, meaning the settings are lost if processor power is removed. However, it is assumed that power to the processor chip will always be applied (so it can listen to the remote for commands). Power to the preamp circuits can be switched by the power relay, but power to the processor should always be present.

If I understand this part... it will lose the volume, balance and input selection when powered down. So a user would need to select them to have anything function. Not really a problem as most stuff seems to do this. Am I correct?

Subject: Re: Firmware
Posted by Wayne Parham on Tue, 27 Sep 2011 17:49:01 GMT
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What I'm suggesting is to have a separate 5V supply to run the processor that's always on. It will only draw a few milliamps.

The power actually can be anything between 5v and 6v (not a strict 5v TTL thing), so the processor supply can be a rechargable 6v battery, like (4) AA cells.

The point is, I would probably make provisions to keep the processor powered up, even if the rest of the circuit is powered down. The processor cannot sense the "power on" command if it isn't up and running.
