

## Re: Do you think NI can fix my PLL? -- Details

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Hello Chris,

Of course there needs to be a speed feedback path for #3 to work. As we know, there are issues with that. For my fast wheel, there is an encoder available, which would need an F-to-V converter. ...

That would be pretty easy, basically a precise pulse generator (\_not\_ the usual 555 thingie) whose pulse length is set to the shortest possible interval at the highest motor speed (minus some margin), and a non-leaking integrator.

... For the slow wheel, there would only be the possibility of getting 3 pulses/rev from the halls.

How about measuring the time between two consecutive pulses and outputting a DC voltage proportional to that? Could be done via a counter and a DAC. The DAC would update at every pulse and the counter would be reset at that same time, to clock up the next episode. Or you could do it analog.

Goals:

Build PLL around both motors with minimum of custom construction. Focus should be on choosing the hardware that will drive the motors leaving the design problem boiled down to PLL loop stabilization. Must work around limitations of commercial PWM drives, or perhaps find better drives... Resolve which topology is best and simplest: PLL around speed servo, or voltage mode motor drive PLL.

As suggested earlier I think you do have to check the quality of the PWM part and anything before that if you decide to go with a commercial motor controller unit. If they used an old one-shot as the PWM source that

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might be a concern. Take a good look at this with a scope.

Just FYI: The old National LM331 is a chip that I found to be remarkably clean in V/F and F/V applications.

Another option is to call the engineers at the company that made the motor controller, briefly describing what you want to do and asking them whether their product would be capable enough for that. They should know.

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Regards, Joerg

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