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Motion protection framework for TPS insertion device control

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This paper introduces a motion protection framework for Insertion Device (ID) control in TPS. The motion protection for ID originally combines software soft limit protection and hardware limit switch protection. However, under certain optical encoder abnormal conditions, the limit switch is eventually triggered. The problem is that such events often result in potential hardware damage due to high-speed collisions with the limit switch. To ensure the safety of ID motion control, this paper proposes triggering an abort signal to controller using the difference between the optical encoder and potentiometer values. This approach significantly mitigates motion control issues caused by optical encoder abnormalities. This paper will discuss the details of hardware and software design and provide application examples.

Footnotes

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