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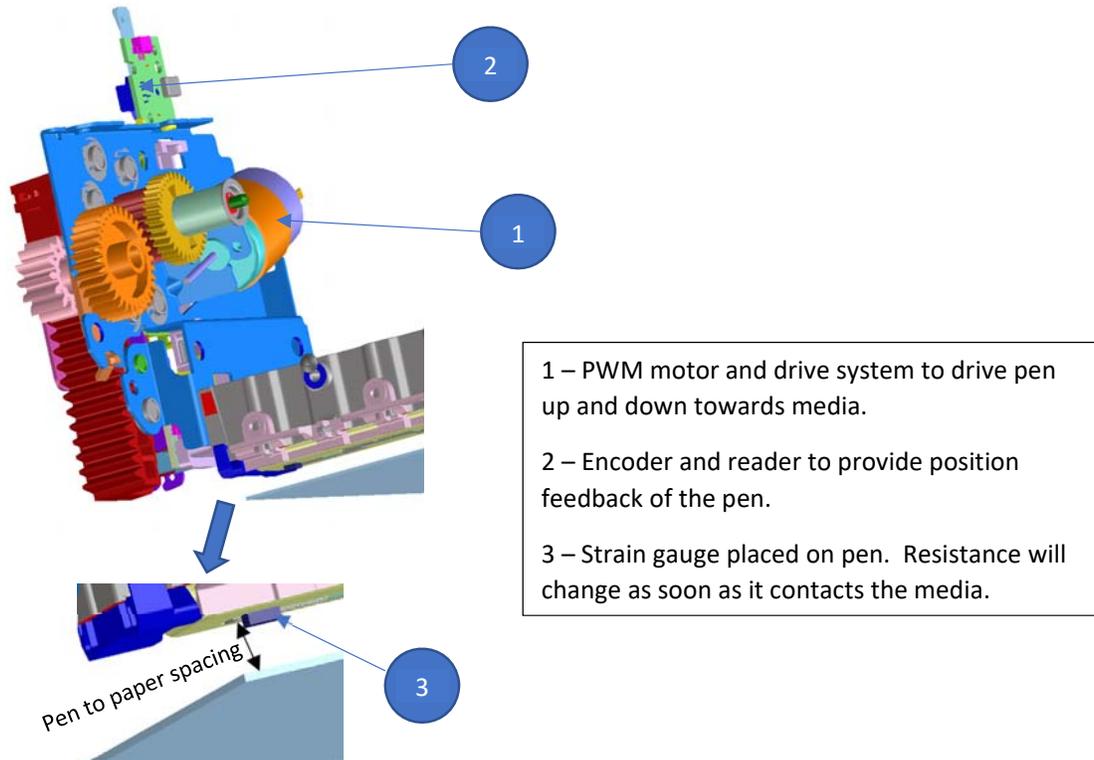
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Automatic Method for Pen to Paper Spacing Using an On-die Strain Gauge

In a printer, accurate spacing between the pen and the paper is critical. If it is too high, then the drops will not land on the paper in the correct location. If it is too low, then the paper will contact the pen and cause damage or smear. In certain applications, such as an over printer, many different media types can be printed on the same system and these media types will have different thickness and therefore the pen to paper spacing will need to be adjusted. Also, there is variation in media thickness and pen height that is difficult to account for.

This innovation is an extension of the related "Automatic Method for Pen to Paper Spacing" innovation, which sets pen to paper spacing by first moving a "crash plate" until it contacts the printhead. The position of the pen and the PWM to the motor that moves the pen down can be monitored and used to detect the precise position that the plate contacts the media in the printzone. Then, the position of the pen can be adjusted upward relative to the exact contact position to achieve the desired pen to paper space.

The innovation in this disclosure, uses the same apparatus and method to monitor the pen location except that the PH has an on-die strain gauge to detect the position that the pen contacts the media. The strain gauge is monitored by the printer electronics, waiting for a sudden change in resistance. At that point, it is known that the gauge has contacted the media, just the same as by detecting the PWM spike of the motor moving the plate. This method has the advantage of being far more sensitive, and also in being watchful that any forces do not exceed safe limits for the printhead (i.e. stop before you smash it). We have proven on silicon that this is highly feasible, both in terms of cost and performance.



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