



# USING THE A6850 AS AN AK PROTOCOL SPEED SENSOR INTERFACE

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## INTRODUCTION

The Allegro A6850 is an interface integrated circuit (IC) that provides the sensor output state and diagnostic data (open and short status) between two-wire current output sensor ICs and a microcontroller. In its typical application configuration, this IC uses protected high-side low-resistance switches to supply voltage (with current-limiting circuitry) to two individually controlled sensor channels. In this typical configuration, current limitations preclude its use as an AK-protocol interface; however, simple modifications allow for this use case.

## AK-PROTOCOL CONFIGURATION

While the current limit of an individual A6850 output channel is insufficient to power an AK-protocol sensor IC, it is possible to gang the outputs to achieve this, as illustrated in Figure 1.

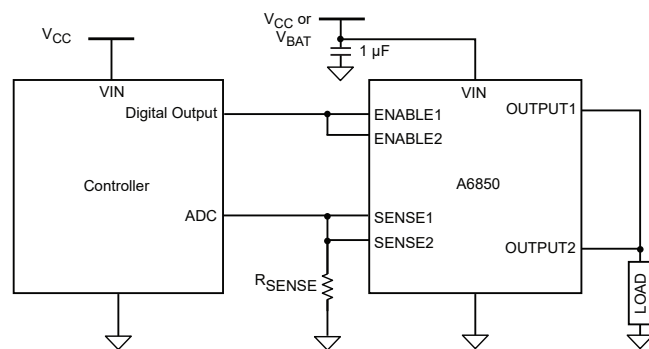


Figure 1: AK-Protocol Configuration

The OUTPUT1 and OUTPUT2 pins must be shorted together to raise the overall current limit; likewise, the SENSE1 and SENSE2 pins must be shorted together to combine the referred sense current (a 1/10th-scale facsimile of the output current) into a single sensed voltage across the  $R_{SENSE}$  resistor. Finally, the ENABLE1 and ENABLE2 pins must be shorted together to ensure that timing issues, current-limit events, etc., do not occur.

## STARTUP CONSIDERATIONS

It is important to note: When the output pins and sense pins are ganged together in this way, the conditions are created at startup for a transient voltage across the sense resistor. These conditions are caused by the inrush current to the load capacitance presented to the ganged output at startup. Depending on the threshold voltage of the sense monitor, these conditions can be read as a false output event. Therefore, it is recommended to blank the sense monitor at startup.

## CONCLUSION

AK protocol is a popular output protocol in speed sensor ICs. By following the guidance in this application note, the A6850—a proven interface IC—can be used for AK protocol applications.

*Revision History*

Number	Date	Description	Responsibility
-	March 27, 2025	Initial release	Z. Richards

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