

# BEI SENSORS

## ANTI-DITHER MODULE

## DIN RAIL MOUNT



### HOW IT WORKS:

This interface module uses the position information in a dual channel quadrature encoder to remove spurious counts caused by mechanical vibration. Logic gates in the Anti-Dither Module use the quadrature relationship to discriminate between dithering and actual movement. The resulting output is a phase-shifted quadrature signal with  $\pm 1/4$  cycle of hysteresis. The index pulse from the encoder is optically isolated and passed directly to the controller for use as a reference.

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### WHY USE AN ANTI-DITHER MODULE ?

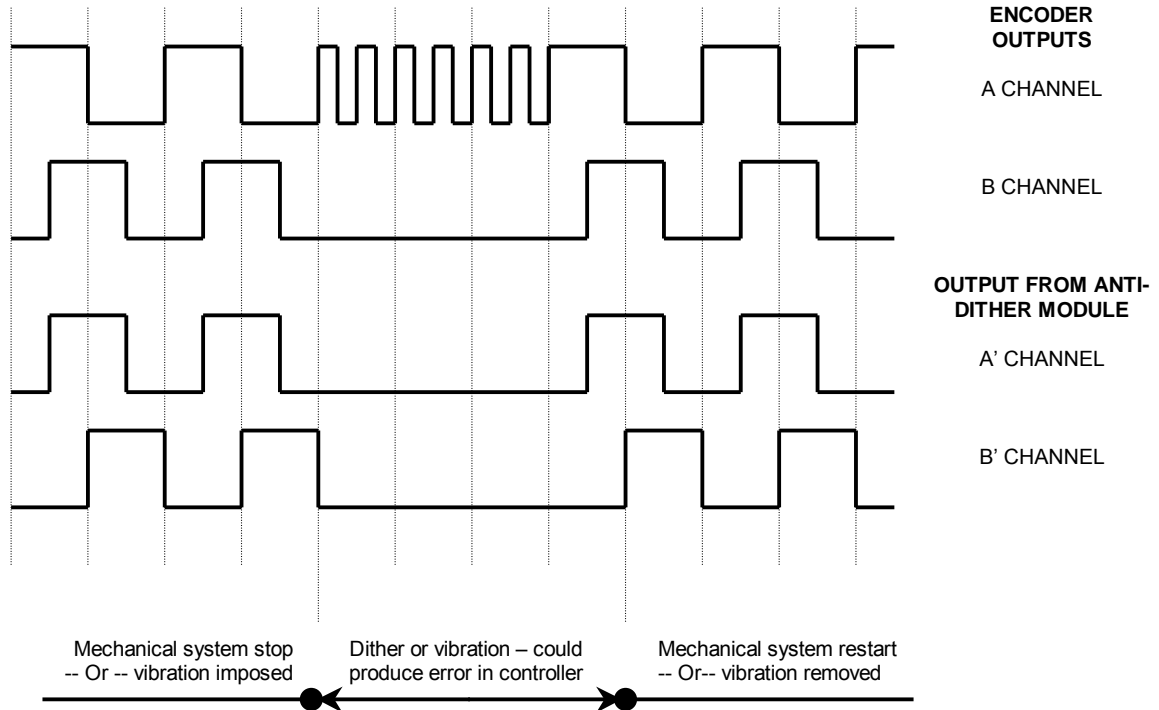
#### CASE 1 – STARTS AND STOPS

In certain applications, such as conveyor systems or web processes it may be necessary to stop the line to clear a jam or reset the process. There is no way to control where the encoder is in its output cycle when this occurs: it may have stopped at the rising or falling edge (a transition) of an output channel or somewhere in between. When it stops on a transition, there can be ambiguity in the controller. The output of the encoder may dither from its HI state to its LO state due to mechanical noise in the conveying system. This fluctuation can be read as true motion in the controller. The Anti-Dither Module creates hysteresis so mechanical dithering does not create a false count.

#### CASE 2 – HIGH VIBRATION

Another situation arises where the end use involves very high vibration -- construction machinery or mill duty applications for example. This is especially true when the encoder is being used as a single channel tachometer. In this instance the encoder output can have a vibration signal superimposed on the data channel, leading to multiple transitions on every cycle. This effect can be eliminated in the controller if the encoder has dual channels in quadrature, however that is not always an option. In this case, the Anti-Dither module can clean things up

# WAVEFORM DIAGRAM ILLUSTRATING OPERATION OF THE ANTI-DITHER FUNCTION



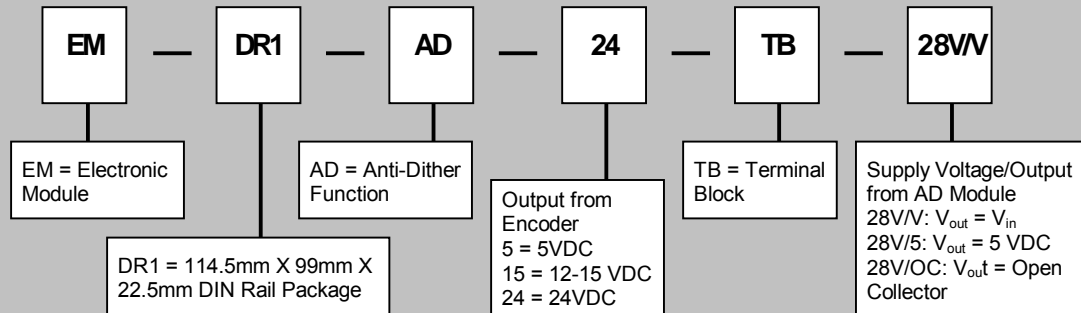
Note: For simplicity of illustration, the inverted channels, A/ and B/ have not been shown. The index, or Z, channel is also not shown in the above diagram but is passed through directly as an optically isolated signal and maintains its original relationship to the encoder output channel. Reference <http://www.beisensors.com/pdfs/oim.pdf> for connection diagrams.

## Anti-Dither Module Order Options

For assistance, call 800-350-2727

Use this diagram, working from left to right to construct your model number:

Example: EM-DR1-AD-24-TB-28V/V



Note: Refer to BEI Opto Isolator Module Applications guide for mechanical specifications and connection instructions.