MicroE
Motion Control Starts Here.

TECHNICAL NOTES: INTERFACING WITH DRIVES

Connecting MicroE Optira Series Encoder to AMC DigiFlex Servo Drive

TN-1304 | REV 151214

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1 INTRODUCTION

This document will follow the process involved in mounting a MicroE Optira quadrature encoder on a linear stage and the connecting it to 2.3 AMC's DigiFlex Servo Drive.

2 REQUIRED ITEMS

2.1 Optira

The Optira Series Encoder combines MicroE's patented PurePrecision™ technology with state-of-the-art electronics and signal processing to deliver unprecedented performance in an incredibly small and lightweight package, providing resolution of up to 5nm with all AGC, interpolation, and signal processing performed in the sensor head. Make sure to visit http://www.microesystems.com/resource/product-documentation to get our latest documentation available.

2.2 Optira Development Kit

The Optira Development Kit includes a flat cable, calibration board, and a DB-15 output cable. Refer to the Optira Spec installation manual for more info.

2.3 AMC's DigiFlex Servo Drive

The DigiFlex® Performance™ (DP) Series digital servo drives are designed to drive brushed and brushless servomotors. These fully digital drives operate in torque, velocity, or position mode and employ Space Vector Modulation (SVM), which results in higher bus voltage utilization and reduced heat dissipation compared to traditional PWM. Make sure to visit http://www.A-M-C.com to get the latest documentation available.

2.4 Computer with AMC'S DRIVEWARE Setup & Indexing software loaded

AMC'S DRIVEWARE software is available for download on their website. This is used to set up the drive for the first time.

2.5 Power Source

Review the documentation for the all the components to determine the correct voltage and amperage to run your equipment.

2.6 Documentation

Before you begin, have the manuals for each product available for review.

3 WIRE ENCODER-TO-DRIVE CONNECTOR (J5 CONNECTOR)

Encoder AMC J5 Connector

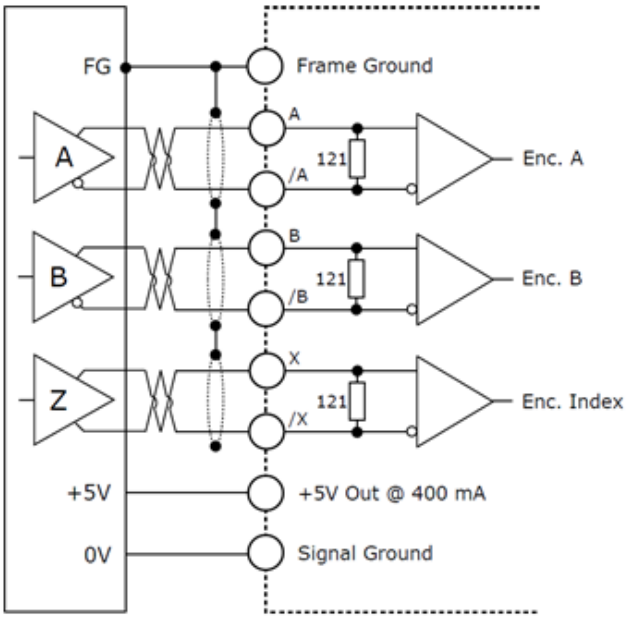

Figure 1 Digital Encoder

AMC C3	AMC Desc	MicroE Wire	MicroE DB15
5	Enc /A	GRN	6
7	Enc /B	BRN	5
9	Enc /X	VIO	4
12	Sgnd	BLK	9
NC	F.G.	YEL	14
1	Enc A	ORN	13
2	Enc B	BLU	12
3	Enc X	RED	8
13	+5V	WHT	3

Encoder AMC J5 Connector

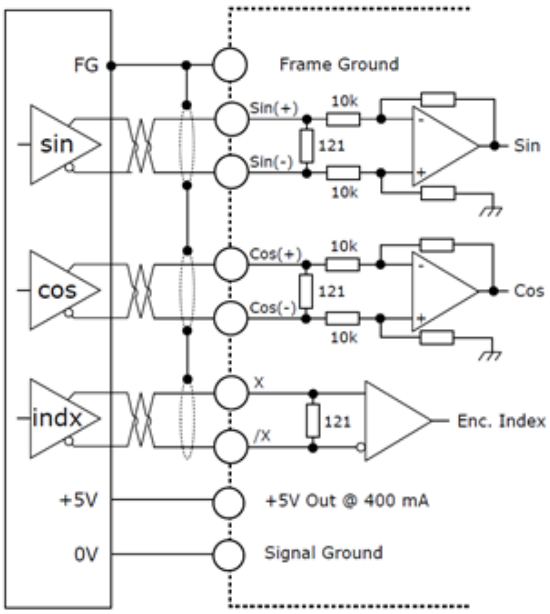

Figure 2 Analog Encoder

AMC C3	AMC Desc	MicroE Wire	MicroE DB15
9	/X	VIO	4
12	Sgnd	BLK	9
5	Sin(-)	GRN	6
7	Cos(-)	BRN	5
NC	F.G.	YEL	14
8	X	RED	8
13	+5V	WHT	3
4	Sin(+)	ORN	13
6	Cos(+)	BLU	12

4 MOUNT THE TAPE SCALE

4.1 Mounting Surface Preparation

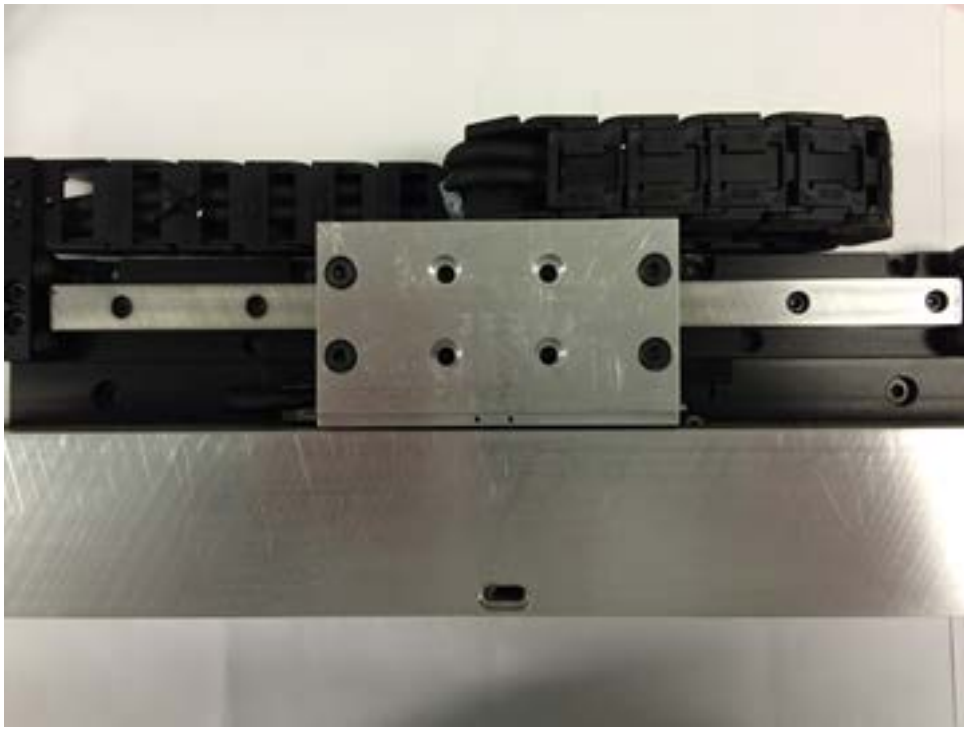

Figure 1

4.1.1 Clean surfaces, following instructions provided in the Tape and Glass Scales Installation Manual.

4.2 Installing the Scale

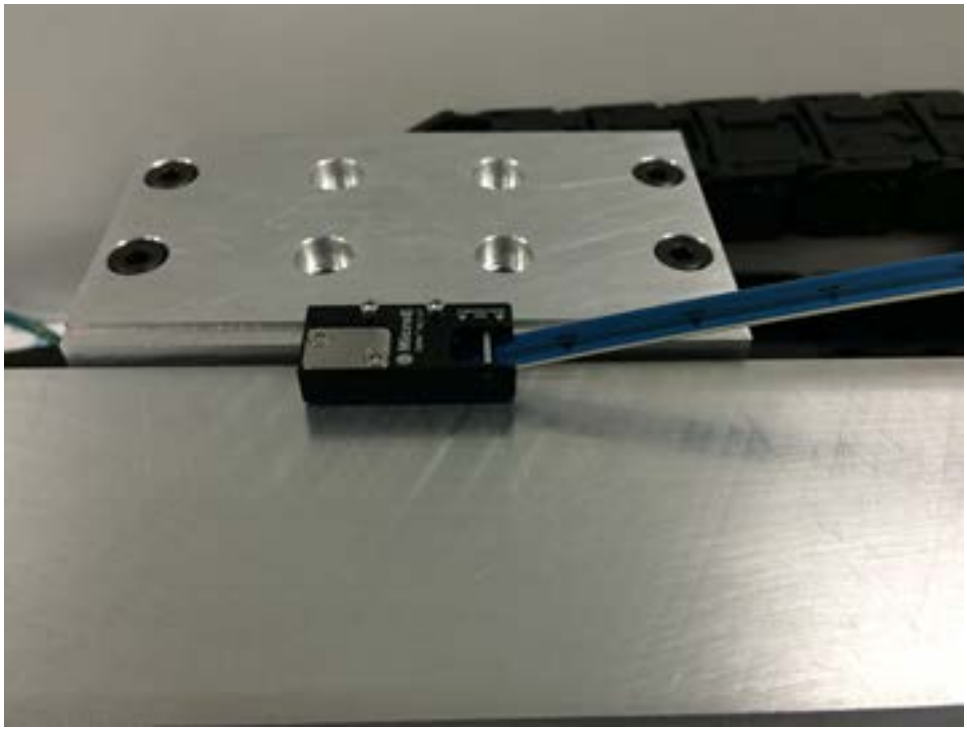

Figure 2

4.2.1 Use the mounting holes for the encoder to attach the Scale Applicator Tool using two 0-80 x 3/8”.

4.2.2 Move the stage carriage to the extreme left of travel to start.

4.2.3 5. Peel back the clear adhesive cover on the bottom of scale approximately 1 inch.

4.2.4 6. Insert the scale with the black on blue arrows pointing the same direction as the white on black arrow on the applicator tool.

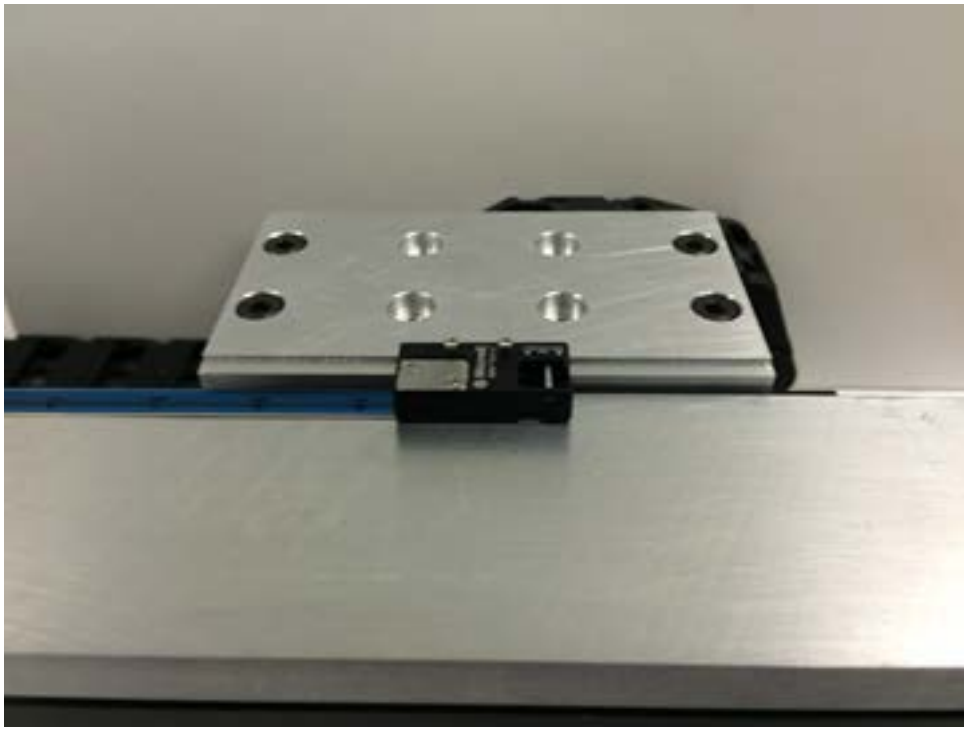

Figure 3

4.2.5 Feed the scale through the tool as you pull the carriage to the right removing the clear adhesive cover as you go.

4.2.6 You may need to remove the tool to get the last of the scale through the tool and onto the surface.

4.2.7 Use your finger to press the scale onto the surface over the full length to make sure the best adhesion.

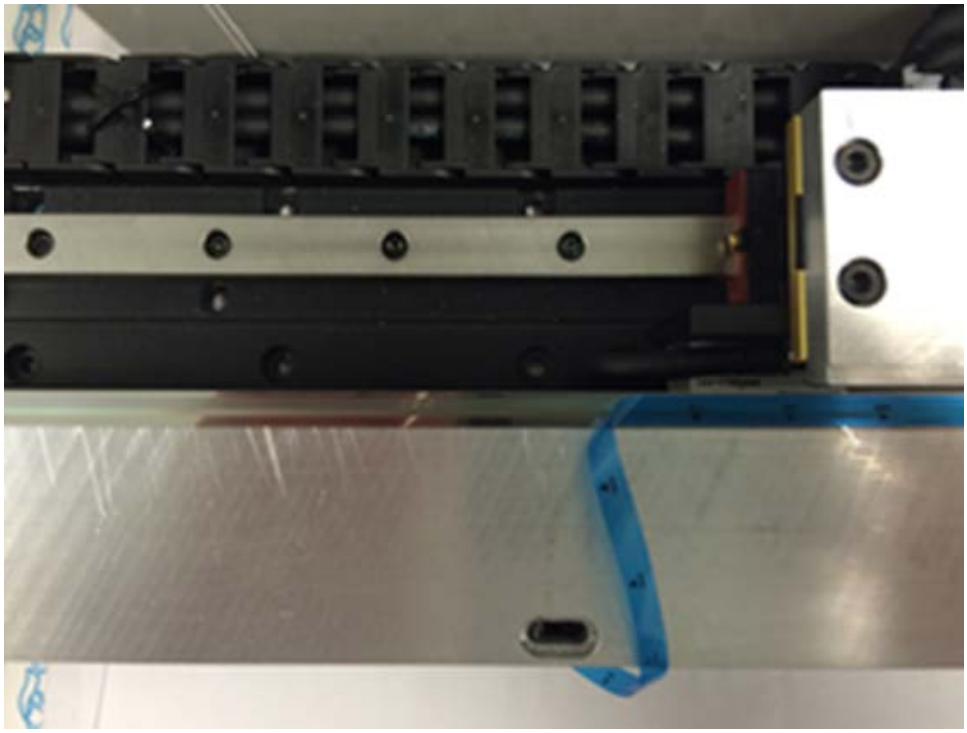

Figure 4

10. Once the scale is installed, you can remove the blue protective film from the top of the scale.

5 INSTALL OPTIRA SENSOR AND CALIBRATION BOARD

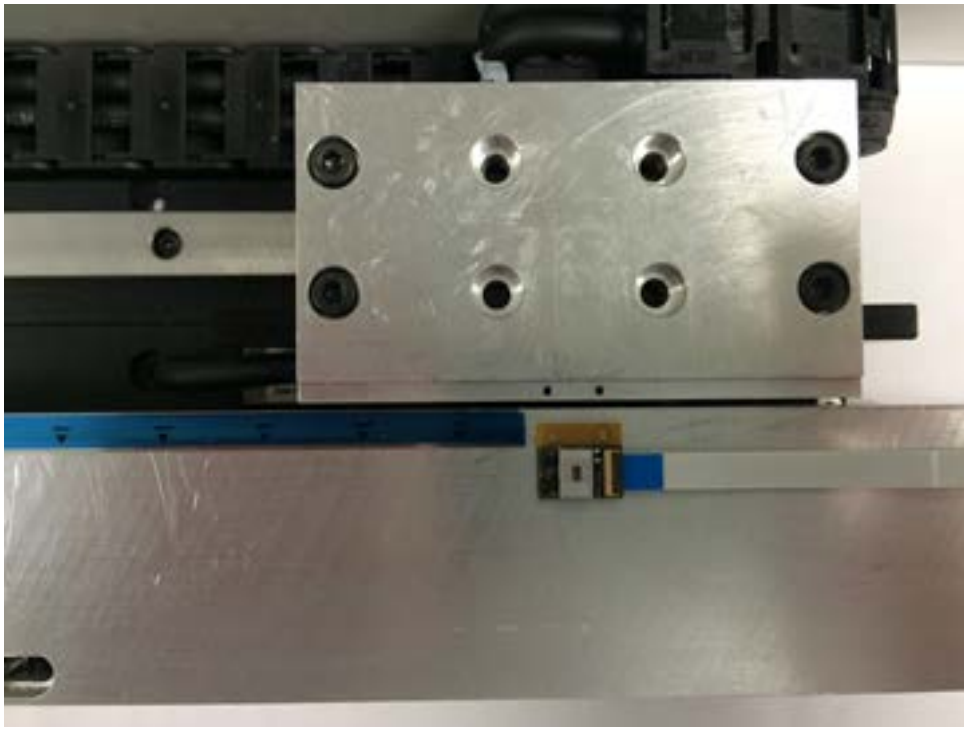

Figure 5

5.1.1 Attach the FPC (Flat Flexible) BEFORE installing the encoder.

(The flex cable exposed contacts should be on the opposite side from the brown connector lock)

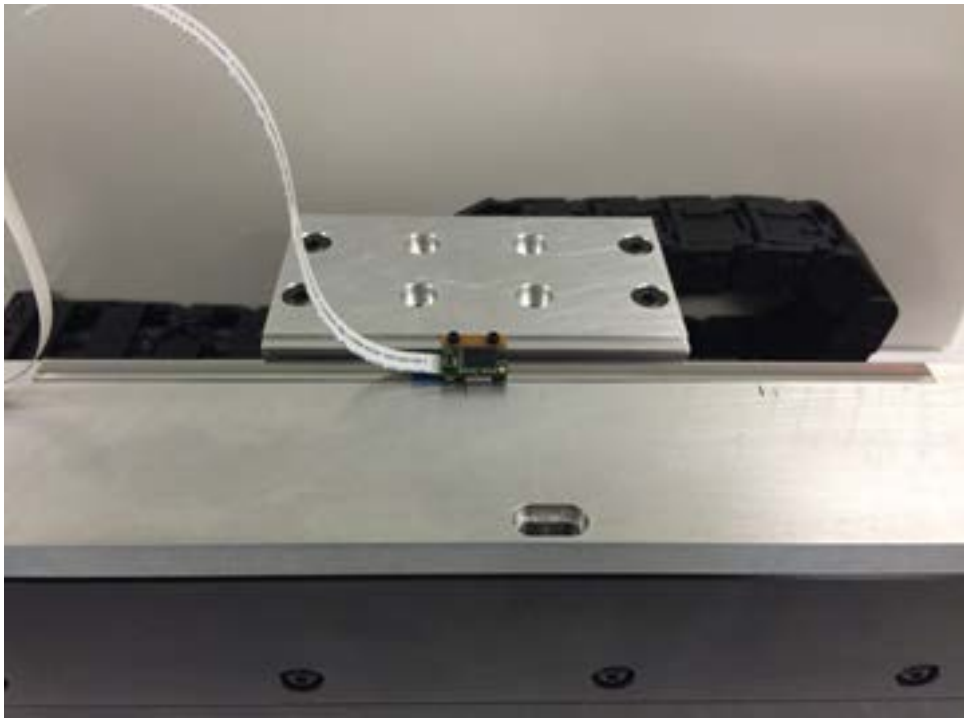

Figure 6

5.1.2 Attach the encoder to the stage carriage using two 0-80 x 1/4 button head screws.

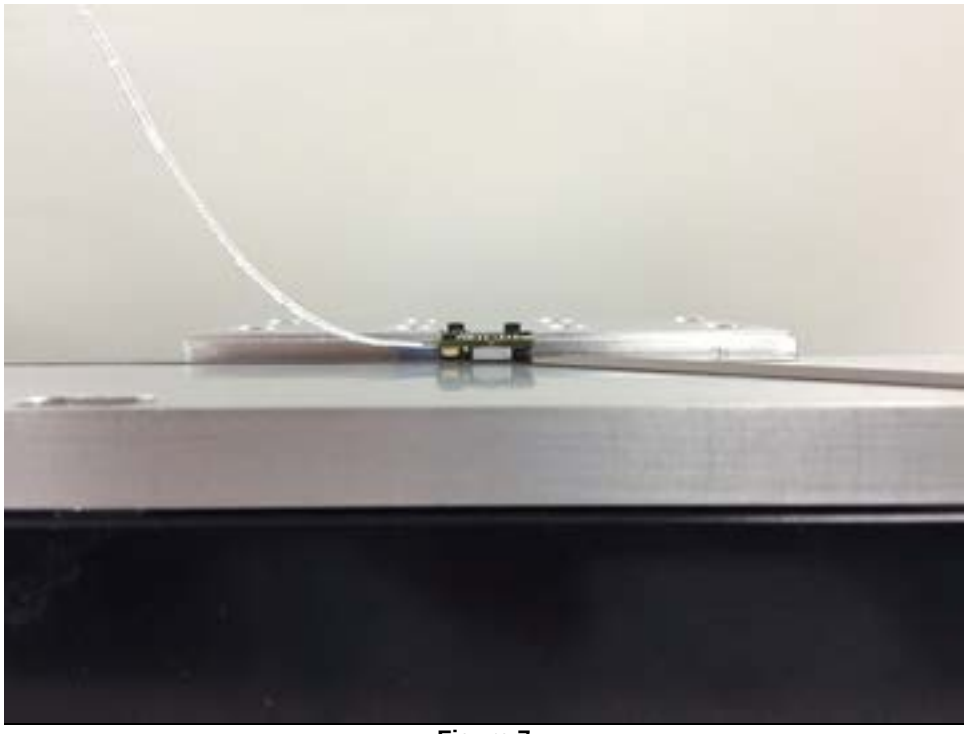

Figure 7

5.1.3 Use the Z-height Shim Spacer (part of optional development kit) to set the proper gap between the sensor's riser and the top of the scale (0.010"). Refer to the Optira Interface Drawing for details.

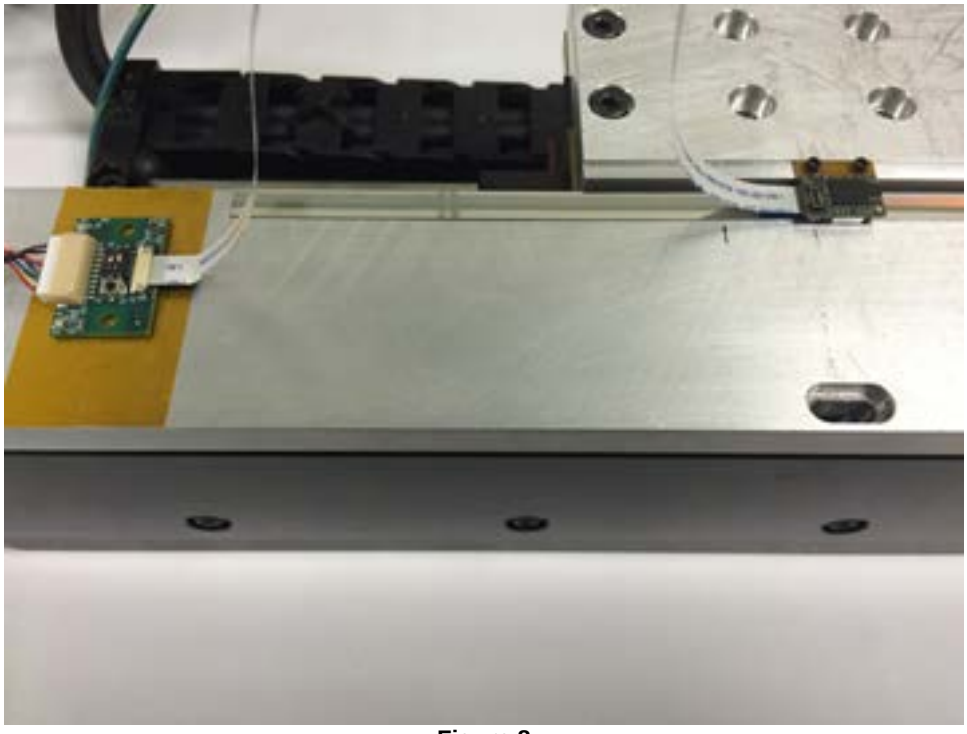

Figure 8

5.1.4 Connect the other end of the FPC (Flat Flexible) to the calibration board.

5.1.5 (The flex cable exposed contacts should be on the opposite side from the brown connector lock)

5.1.6 Mount the calibration board to the stationary part of the stage.

5.1.7 (Kapton tape is recommended for electrical isolation if you choose to mount directly to the stage)

5.1.8 Connect the DB-15 output cable to the other side of the calibration board.

6 POWER UP AND CALIBRATE OPTIRA

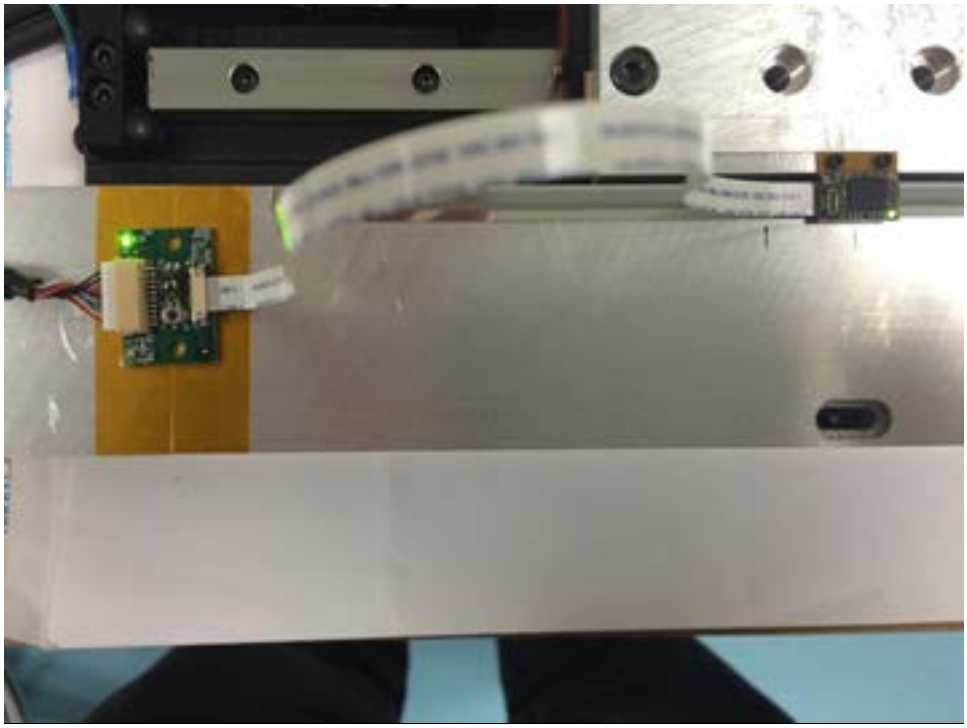

Figure 9

6.1.1 Turn on the power source to the AMC Drive (J6 should be disconnected at this point).

6.1.2 You should see a green LED on both the encoder and Calibration board.

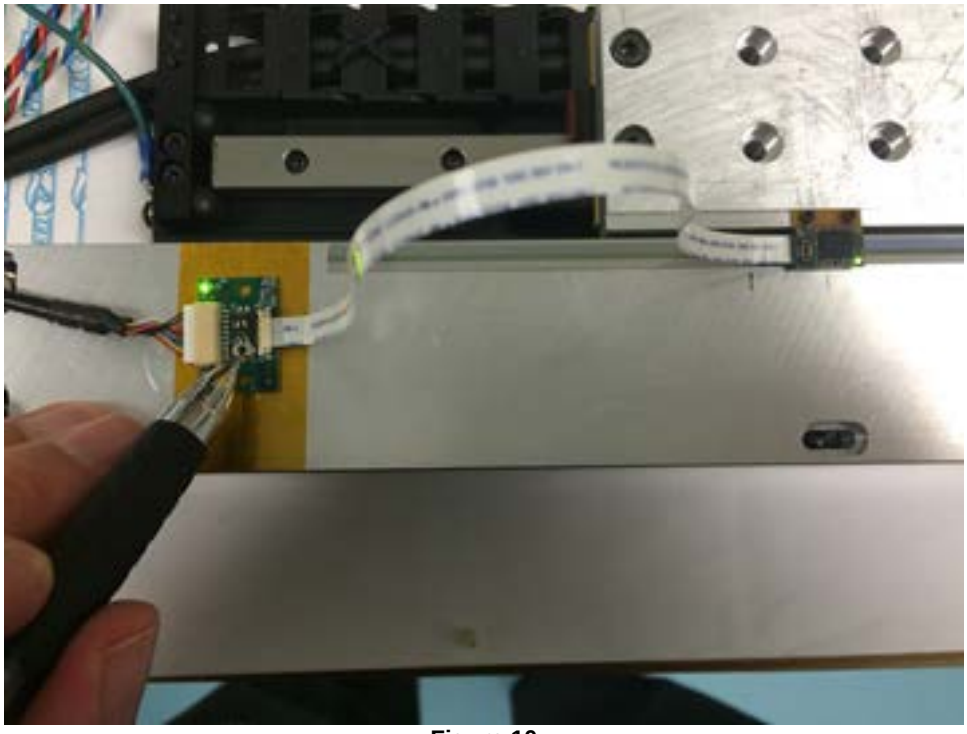

Figure 10

6.1.3 Press the Calibration momentary switch to initiate Index Optimization.

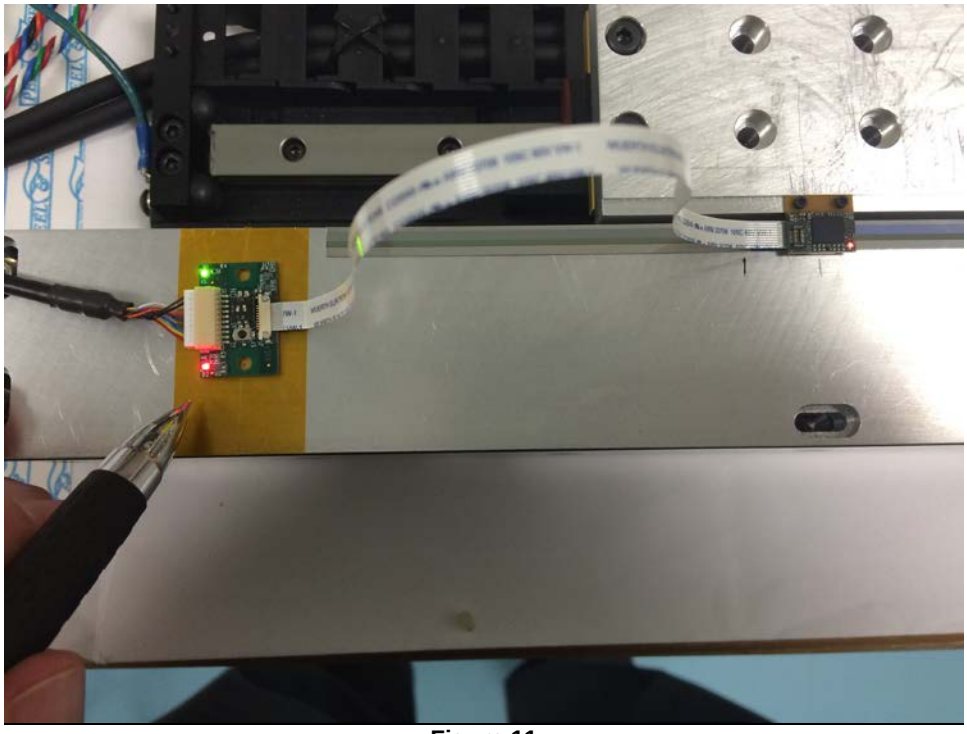

Figure 11

6.1.4 The Red Fault LED will illuminate to indicate that it is in calibration mode.

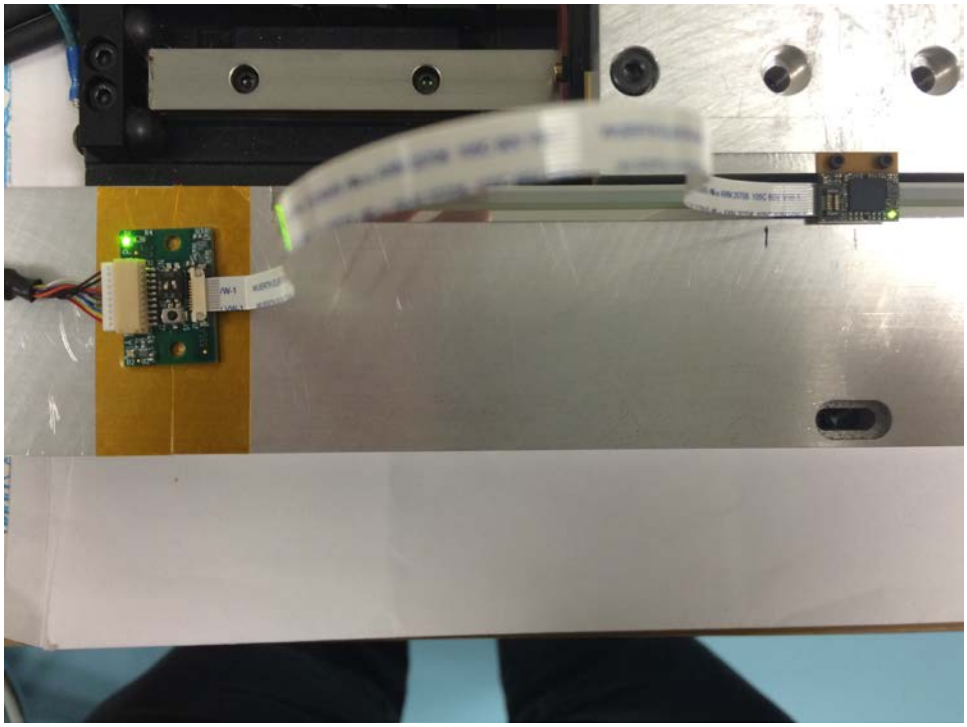

Figure 12

6.1.5 Manually move the encoder/carriage repeatedly over the index on the scale until the LED turns green.

7 AMC DRIVE SETTINGS

7.1 Set up communications

Figure 13

7.1.1 Open AMC's DRIVEWARE software (Figure 13).

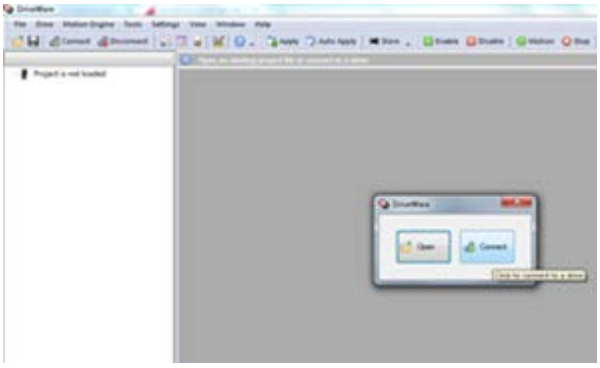

Figure 14

7.1.2 Connect to the drive.

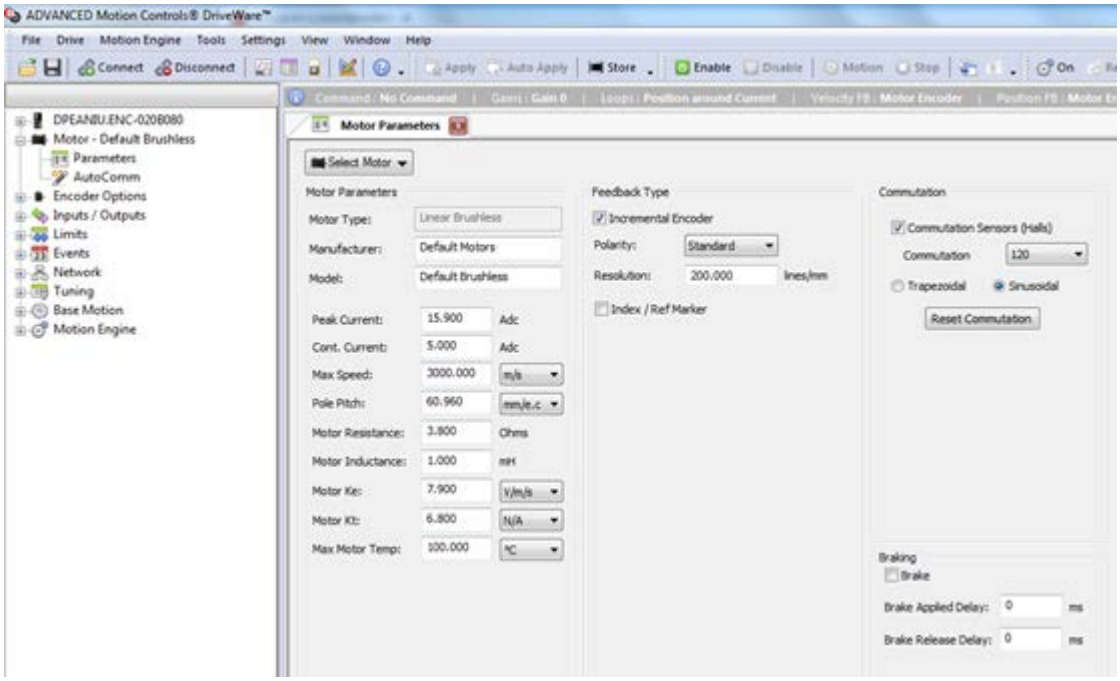

Figure 15

7.1.3 Enter in your motor and encoder parameters. In this case we used a 5um(.005um) resolution so we enter 200 lines/mm

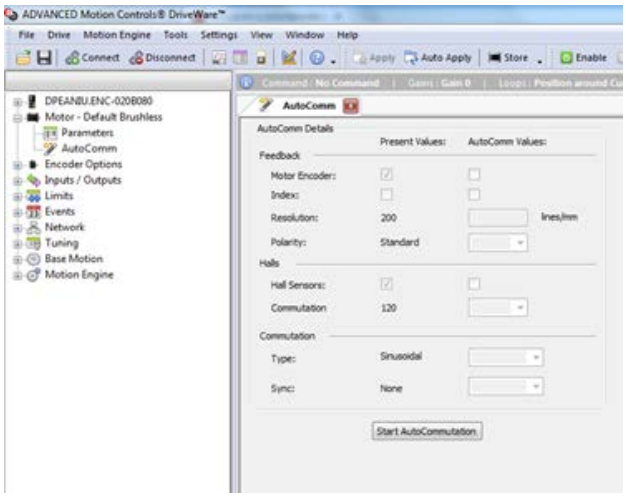

Figure 16

7.1.4 Start Auto Commutation.

8 CONCLUSION

This document gives a brief description of how to set up an AMC drive with a MicroE Optira encoder using AMC's DriveWare software. It should be used in conjunction with the most recent installation manuals for both components which will be available at www.microesystems.com and www.A-M-C.com . There is also application assistance available at celera_support@gsig.com