kSA RMAT

Rotational Monitoring And Triggering

The Rotation Monitoring and Triggering (RMAT) system has been developed by k-Space to provide an accurate, programmable triggering solution for synchronizing metrology equipment to sample rotation during thin-film deposition.

The package seamlessly integrates a 12-bit absolute encoder and programmable logic controller (PLC) with user-friendly Windows-based software to provide four programmable trigger outputs that can be used to initiate measurements at specific rotation positions.

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STANDARD HARDWARE

Encoder Specifications

Encoder Type	12-bit absolute, SSI interface
Steps per revolution	4096 (0.088°)
Repeat Accuracy	0.002°
Communication	RS-232 to USB
Mechanical Interface	Solid Shaft, 10mm
Flange Dimensions	2.5-inch (63.5mm) square flange (see drawing)
Maximum Speed	9000 RPM
Lifetime	3x109 revolutions

PLC Specifications

Processor	32-bit RISC processor
Encoder Input	SSI with 2MHz clock
Polling Period	125us
Trigger Outputs	4 programmable opto-isolated channels, 5V, 25mA sourcing on each.
Pulse Width	Programmable, 1ms – 254ms (0ms yields 125us pulse width).
Trigger Accuracy	≤42 RPM, trigger output will occur at programmed encoder position; >42RPM,<84RPM output will occur at encoder position with +/- 1 encoder position tolerance.

Note: Maximum polling rate of encoder position is 125us + PLC runtime comparison to programmed trigger positions. Above 42RPM the PLC cannot guarantee an output at the required position. Maximum acceptable position error for trigger output is selectable by user, up to maximum of 25 position error.

System Power Requirements

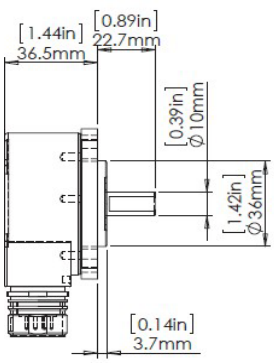
Voltage Input: 100-240VAC, 0.45A
Computer Interface: USB 2.0

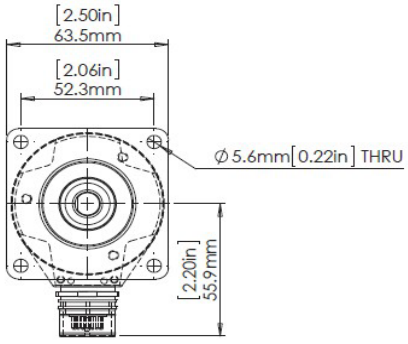
Supplied Cables

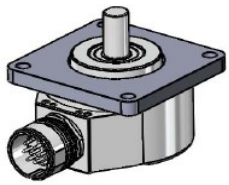
USB 5m (PLC to Computer)
Encoder Interface 6m (PLC to Encoder)
AC Power 2m (PLC)

ENCODER AND PLC DIMENSIONS

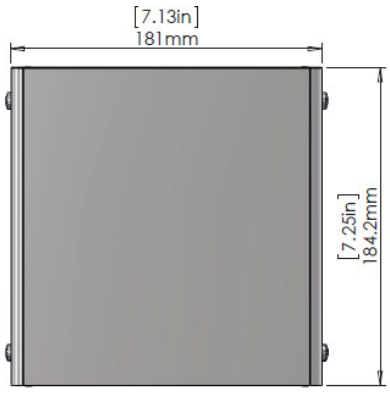
The standard kSA Encoder dimensions are shown below.
k-Space can provide custom coupling collars upon request.

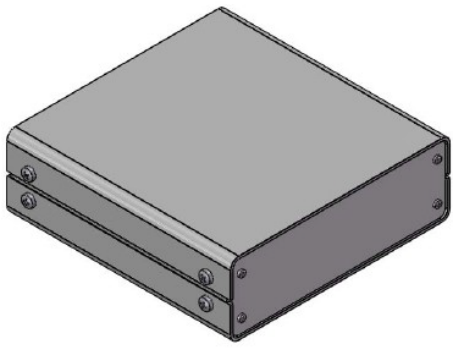






Connector Type: M23
Cable Attachment: Radial
Shaft (ØxL), with Flat: 10x19mm





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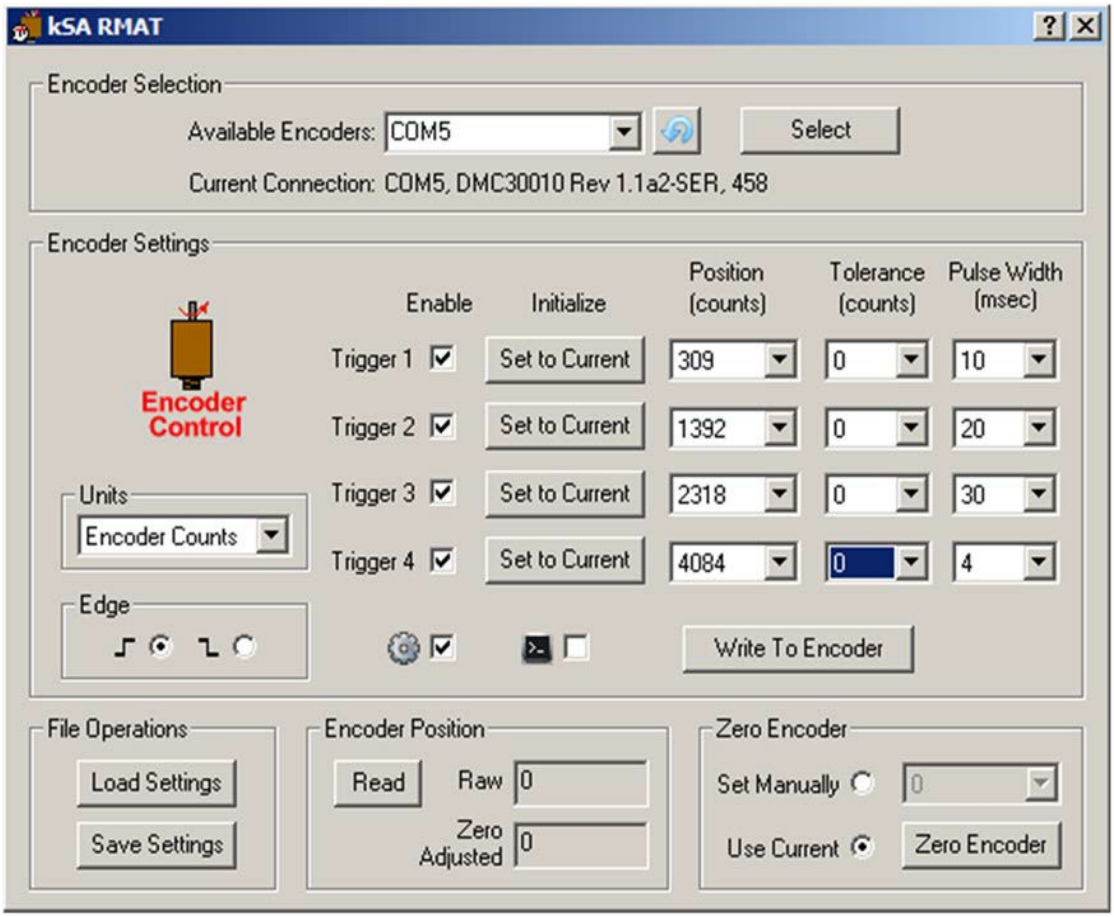
SOFTWARE DESCRIPTION

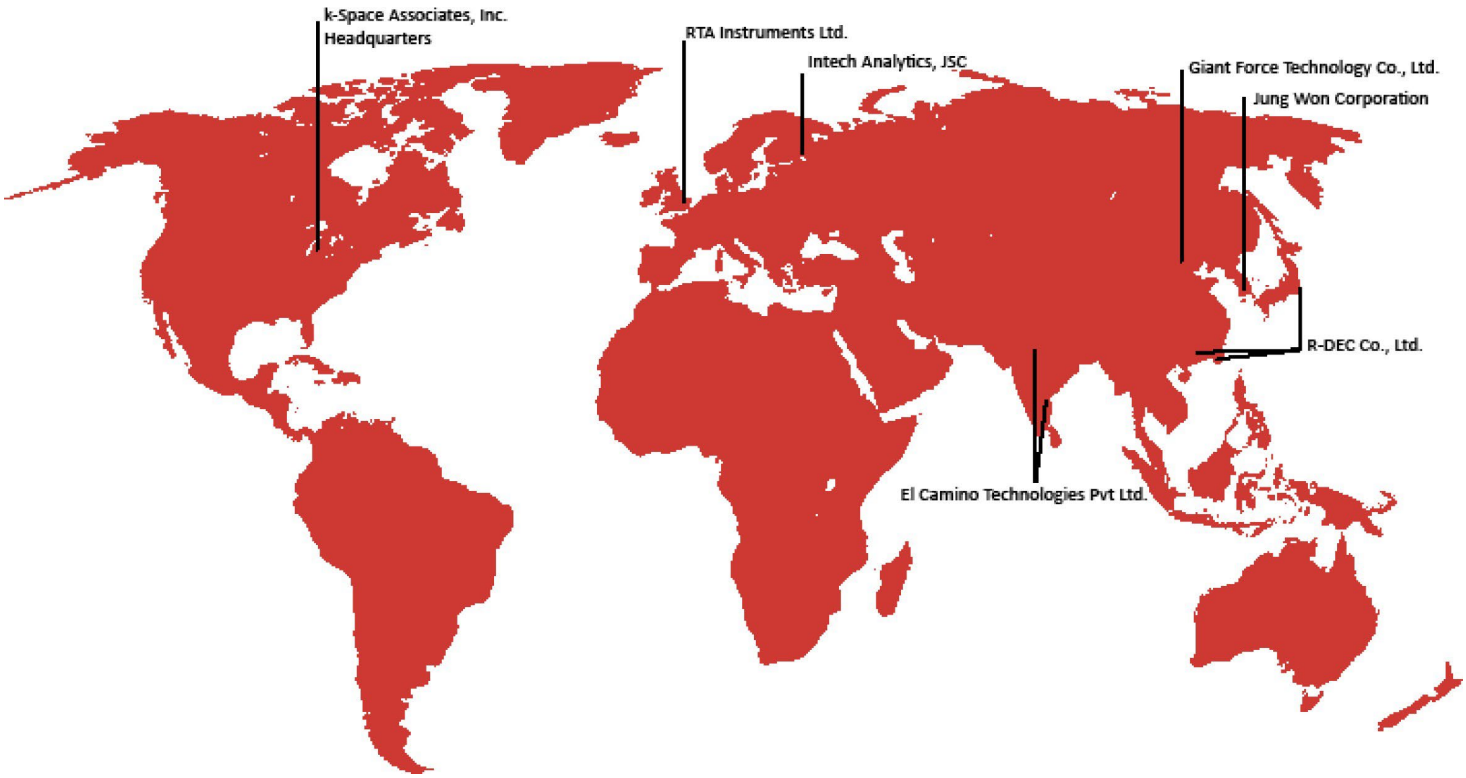
Software Requirements

The kSA RMAT interface software is designed to run on Windows operating systems that are currently supported by Microsoft.

Additional Notes

Trigger positions cannot overlap. The PLC cannot read the encoder while it is outputting a trigger pulse. It is up to the user to ensure that the output trigger pulse width does not prohibit reading the encoder before the next trigger position. This is rotation speed dependent. It is recommended that output trigger pulses are programmed to be as narrow as possible.





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