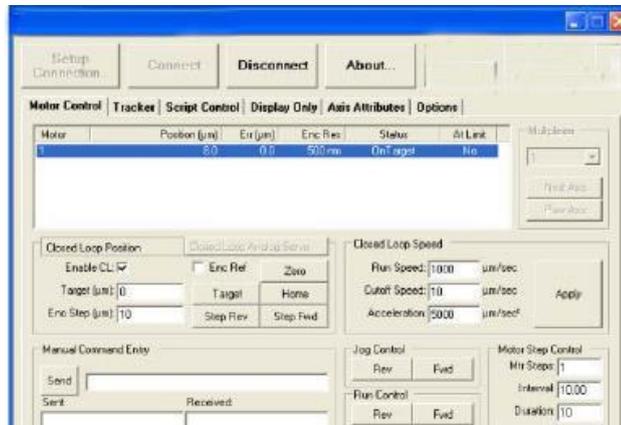


超小型内置控制器旋转台

AU-M3-RS 旋转模块将微型压电马达、精密导向系统、位移传感器、微处理器集成到紧凑的空间中，该模块拥有超小的体积（直径<12mm），在紧凑的空间中包含一个世界上最小的压电马达和 IC 驱动，但却可以提供更高的功率和可靠性，精度比电磁电机高十倍。内置绝对位移传感器，使旋转台的角分辨率达到 0.025° 。采用独特的自锁设计，只有在移动时才使用动力，使其拥有极低的功耗，可采用电池作为设备的电源。

不需要外部控制器。该模块将 PID 控制器集成到电路板上，只需要通过标准的 I2C 或者 SPI 接口输入简单的串行命令就可以驱动该控制器。可以通过 USB 适配器连接电脑，直接通过软件控制聚焦模块的运动。操作简单使用方便。



AU-M3-RS 拥有以下几种开发套件：

① 光束控制和镜面定位系统，该系统是一个完整的光束控制系统。在紧凑的体积（直径 12mm）中包含压电马达、位置传感器、轴承以及内置控制器。在旋转台上安装了一个镀铝膜的镜子，每秒可旋转 1100° ，精度可达到 0.025° 。点对点光束控制和动态扫描频率可达 100Hz。镜子的偏转角度可达到 $\pm 20^\circ$ 。采用独特的自锁设计，只有在移动时才使用动力，使其拥有极低的功耗。输入电压只需要 3.3V。

单轴镜面定位开发套件（AU-DK-M3-RS-U-1M-20）



双轴光束控制系统（AU-DK-M3-RS-U-2M-20-L）

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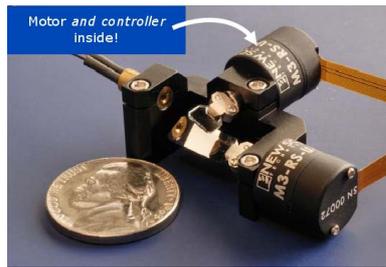
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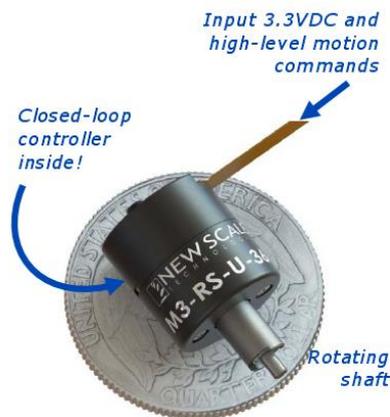
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②旋转定位平台（AU-M3-RS-U-360）是集压电马达、位置传感器、轴承以及内置控制器于一体的运动系统。但是其拥有超小的体积，只有 12（D）×12.5（H）。该系统可以提供连续的 360° 运动，并且拥有绝对位置反馈系统，使其分辨率可达到 0.025°。该旋转台只需要输入 3.3V 的直流电压，运动时耗能仅为 500mW，因此可以用电池或者 USB 作为电源，这非常利于手提和便携式设备。



◆主要特点

- 成本低
- 超小尺寸
- 低功耗
- 无外加控制器
- 高分辨率（0.0057°）

◆主要应用

皮肤科激光、荧光显微镜和成像仪器、体内和体外的微激光手术、3D 打印、激光雷达、三维测量、遥感、防抖动设备、激光打标、激光雕刻、自由空间光通信、目标指示、目标探测、目标跟踪等。

◆主要参数

AU- DK-M3-RS-U-1M-20 Specifications

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Beam Diameter (maximum)	2 mm
Range of Motion	+/- 20 deg
Speed	>1100 deg/sec
Acceleration	>1,000,000 deg/sec ² *
Stall Torque (minimum)	0.04 N-mm
Holding Torque (minimum)	0.08 N-mm (zero power)
Recommended Maximum Payload mounted to rotating shaft (Payload must be balanced)	
Mass	3 g
Inertia	350 g-mm ²
CLOSED-LOOP performance (with built-in position sensor)	
Recommended Step Frequency	Up to 100 Hz
Resolution (encoder resolution)	0.025 deg (440 μrad) absolute
Repeatability	+/-0.05 deg (880 μrad)
Accuracy	0.25 deg (4400 μrad)
Maximum Closed-Loop Step & Settle Times (0.99 g-mm ² inertial load*)	
0.5 deg	9 ms
5 deg	14 ms
20 deg	21 ms
OPEN-LOOP performance (external position sensor provided by user)	
Resolution	<0.0057 deg (<100 μrad)
Accuracy	Typically better than 10% of distance travelled after calibration
Maximum Open-Loop Step Times (0.99 g-mm ² inertial load*)	
0.05 deg	0.5 ms
0.5 deg	1.6 ms
5 deg	6 ms
20 deg	10 ms
Input Voltage	3.3 V DC
Power Consumption (typical)	
Input directly to stage	500 mW active, moving 190 mW active, ready 50 mW standby
Input via USB interface (break-out board)	675 mW active, moving 365 mW active, ready 150 mW standby
Stage Mass	3 g
Operational Lifetime	> 2,000,000 random positions**
Temperature/Relative Humidity	0 to +60 C, non-condensing
Communication Interface	I ² C, SPI, UART, analog servo <i>Input directly to M3-RS</i>
Controller	Integrated into stage, 64 MIPS <i>NO external controller needed</i>

* With inertial load of mounted mirror M3-RS-U-Mirror-01-11
Internal Stage Inertia 0.39 g-mm²
Mirror Clamp 0.45 g-mm²
Mirror 0.15 g-mm²
Total Inertia 0.99 g-mm²

** Significantly longer life may be available depending on the use case.
Please consult the factory.

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AU-DK-M3-RS-U-2M-20-L Specifications

Beam Diameter (maximum)	2 mm
Range of Motion	+/- 20 deg
Speed	>1100 deg/sec
Acceleration	>1,000,000 deg/sec ² *
Stall Torque (minimum)	0.04 N-mm
Holding Torque (minimum)	0.08 N-mm (zero power)
Recommended Maximum Payload mounted to rotating shaft (Payload must be balanced)	
Mass	3 g
Inertia	350 g-mm ²
CLOSED-LOOP performance (with built-in position sensor)	
Recommended Step Frequency	Up to 100 Hz
Resolution (encoder resolution)	0.025 deg (440 μrad) absolute
Repeatability	+/-0.05 deg (880 μrad)
Accuracy	0.25 deg (4400 μrad)
Maximum Closed-Loop Step & Settle Times (0.99 g-mm ² inertial load*)	
0.5 deg	9 ms
5 deg	14 ms
20 deg	21 ms
OPEN-LOOP performance (external position sensor provided by user)	
Resolution	<0.0057 deg (<100 μrad)
Accuracy	Typically better than 10% of distance travelled after calibration
Maximum Open-Loop Step Times (0.99 g-mm ² inertial load*)	
0.05 deg	0.5 ms
0.5 deg	1.6 ms
5 deg	6 ms
20 deg	10 ms
Input Voltage	3.3 V DC
Power Consumption (typical)	
Input directly to stage	500 mW active, moving 190 mW active, ready 50 mW standby
Input via USB interface (demo board)	1200 mW active, both axes moving 580 mW active, ready 200 mW standby
Stage Mass	3 g
Operational Lifetime	> 2,000,000 random positions**
Temperature/Relative Humidity	0 to +60 C, non-condensing
Communication Interface	I ² C, SPI, UART, analog servo <i>Input directly to M3-RS</i>
Controller	Integrated into stage, 64 MIPS <i>NO external controller needed</i>

* With inertial load of mounted mirror M3-RS-U-Mirror-01-11
Internal Stage Inertia 0.39 g-mm²
Mirror Clamp 0.45 g-mm²
Mirror 0.15 g-mm²
Total Inertia 0.99 g-mm²

** Significantly longer life may be available depending on the use case.
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AU-M3-RS-U-360 Specifications

Rotation Range	360 deg continuous rotation
Speed	> 1100 deg/sec
Acceleration	> 1,000,000 deg/sec ² *
Stall Torque (minimum)	0.04 N-mm
Holding Torque (minimum)	0.08 N-mm (zero power)
Recommended Maximum Payload mounted to rotating shaft (Payload must be balanced)	
Mass	3 g
Inertia	350 g-mm ²
CLOSED-LOOP performance (with built-in position sensor)	
Recommended Step Frequency	Up to 100 Hz
Resolution (encoder resolution)	0.025 deg (440 μrad) absolute
Repeatability	+/-0.05 deg (880 μrad)
Accuracy	0.25 deg (4400 μrad)
Maximum Closed-Loop Step & Settle Times (0.96 g-mm ² inertial load*)	
0.5 deg	9 ms
5 deg	14 ms
20 deg	21 ms
OPEN-LOOP performance (external position sensor provided by user)	
Resolution	< 0.0057 deg (< 100 μrad)
Accuracy	Typically better than 10% of distance travelled after calibration
Maximum Open-Loop Step Times (0.96 g-mm ² inertial load*)	
0.05 deg	0.50 ms
0.5 deg	1.6 ms
5 deg	6 ms
20 deg	10 ms
Input Voltage	3.3 V DC
Power Consumption (typical)	500 mW active, moving 190 mW active, ready 50 mW standby
Stage Mass	3 g
Operational Lifetime	> 2,000,000 random positions**
Temperature/Relative Humidity	0 to +60 C, non-condensing
Communication Interface	I ² C, SPI, UART, analog servo <i>Input directly to M3-RS</i>
Controller	Integrated into stage, 64 MIPS <i>NO external controller needed</i>

* With inertial load of mounted mirror M3-RS-U-Mirror-01-11

Internal Stage Inertia	0.39 g-mm ²
Mirror Clamp	0.44 g-mm ²
Mirror	0.13 g-mm ²
Total Inertia	0.96 g-mm²

** Significantly longer life may be available depending on the use case. Please consult the factory.

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