

# New Scale News

October 2013

Greetings!

We continue to be amazed by our customers' work. We recently learned that our M3-F mini focus module traveled to the deepest spot on Earth, on a submersible piloted by filmmaker James Cameron, as part of a 3D camera system. Read about it below.

In this issue we also highlight our latest advancements in micro motion, including a rotary module (see the video) and several more patents for our integrated motor + electronics drive system technology.

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## ~ Mini focus module does 3D at the bottom of the sea

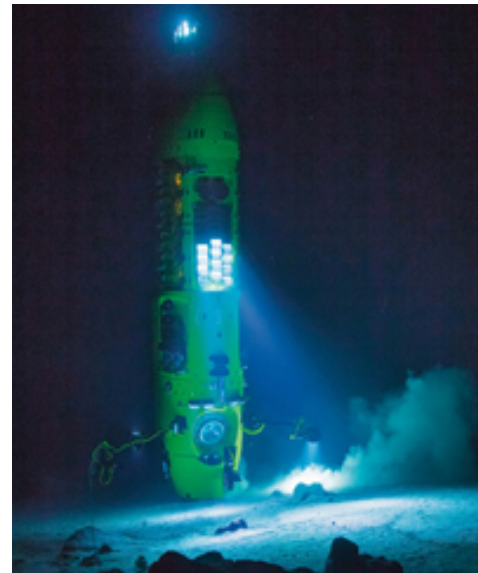
New Scale's mini focus modules were part of filmmaker James Cameron's epic 6.8-mile (11,000-meter) solo dive to the bottom of the Mariana Trench, the deepest known spot on Earth.

The piezoelectric M3-F focus modules were designed into tiny HD cameras, enclosed in titanium pressure housings and mounted on a robot arm on the *DeepSea Challenger* submersible. Two cameras side-by-side enabled 3D image capture.

**"The size of the M3-F makes it a unique product,** and ... very responsive, while maintaining high positional accuracy," said camera system designer Adam Gobi. "It gave us the performance we needed for our 3D application, where left and right camera focus must be perfectly matched."

The expedition took place in March 2012 and was featured in the June 2013 *National Geographic Magazine*. A documentary movie with 3D footage shot by the cameras will be released this fall.

[Learn more](#) about New Scale and the *DeepSea Challenger*.



DeepSea Challenger on a test dive. New Scale M3-F focus modules, integrated into HD cameras on the robotic arm, enabled 3D image capture at the deepest known spot on Earth. (National Geographic photo)

## ~ Video: Rotary micro drive eliminates jitter and magnetic fields

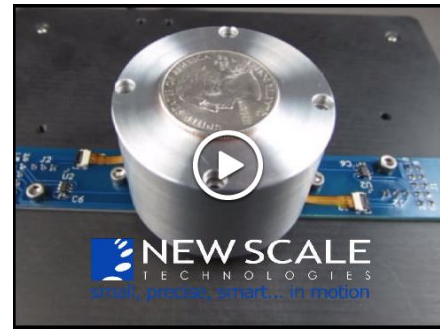
New Scale's rotary piezoelectric micro drive system represents a major advance over servo drives for use in UAVs and micro-UAVs, micro assembly and many other applications.

Unlike servo drives, the new piezo rotary drive has no measurable

jitter, holds position without power, and generates no magnetic fields.

At 44 x 44 x 36 mm the prototype is also smaller than a servo drive, and offers higher position resolution. It exhibits excellent velocity, acceleration and repeatability characteristics. Measured performance includes:

- Speed: 350 degrees/second
- Acceleration: 3000 degrees/second<sup>2</sup>
- Stall torque: 10 mN-m
- No measurable jitter: reported position stable within one encoder count (0.0072 degrees)
- Repeatability: +/- 1 encoder count everywhere (0.0072 degrees / 0.125 mradians)
- Open loop step resolution: better than 0.5 encoder counts (0.0036 deg / 0.063 mrad)
- Wobble in the arc-second range



[View the video](#)  
[Rotary micro drive eliminates jitter](#)

[Learn more](#) about how we use piezoelectric technology to eliminate jitter.

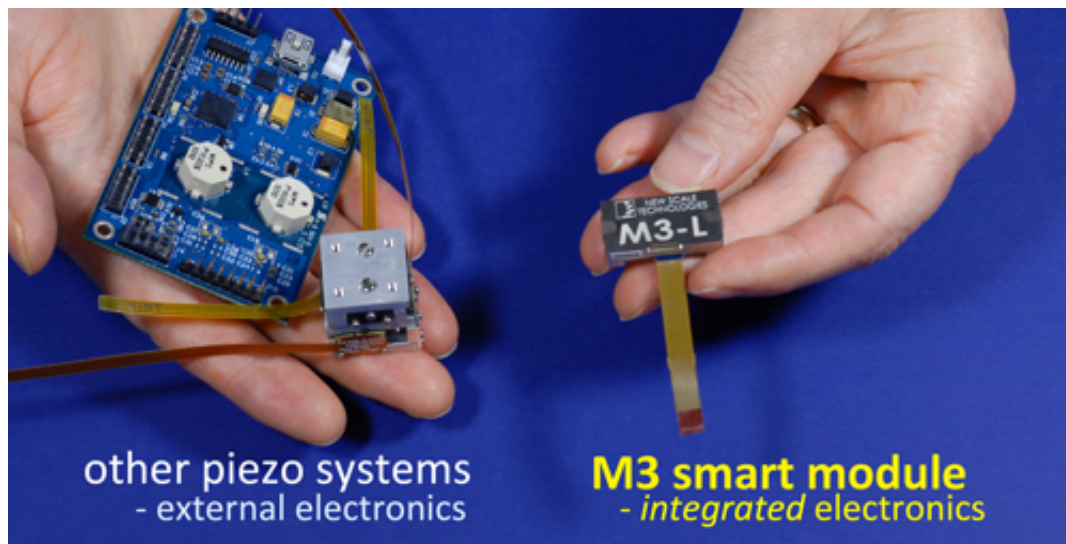
## ~ New patents for smart motion

New Scale has secured four additional U.S. patents for piezo motor control techniques. These innovations are integral to our **smart modules**: tiny, precise motion systems with electronics and control firmware integrated right into the module.

What does this mean for users?

First, it means that the **overall system is much smaller** than competing motion systems, which depend on fairly large external control boards to drive the "miniature" actuators or stages. See the difference below!

Second, it makes the New Scale smart modules **much easier to integrate** into OEM systems. The smart modules accept simple, high-level motion commands over a standard I2C serial interface.



### What other vendors won't show you

Most vendors don't show you the external control board you'll need to run their "miniature" motors and stages. An M3 smart module has everything integrated right into the module - no separate control board needed.

[Read the details](#) behind our latest patents.

[Learn more](#) about M3 smart modules.

## ~ New Scale, Memorial Sloan Kettering featured in MDT magazine

*Medical Design Technology* (MDT) magazine's October issue featured New Scale's piezoelectric motion system that rotates optics in a dual-wedge Risley device for beam steering.

The optics, motors and drive electronics fit in a standard endoscope head. It is part of an endoscopic laser scalpel system being developed by researchers at Memorial Sloan Kettering Cancer Center and previously featured in *New Scale News*.

[Read the article](#) at [mdtmag.com](http://mdtmag.com).



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