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Company's devices used in waters around the world

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By **David Berlin**
UNION-TRIBUNE

February 11, 2007

If you've ever been swimming in a lake and noticed that the warmer water rose to the surface while the colder water fell to the bottom, then you know what fluid stratification is.

If you actually knew that the process was called stratification, then you may have heard of Michael Head, chief executive officer of Precision Measurement Engineering in Carlsbad. And you may be in the small circle of oceanographers and water researchers who use Head's water measurement devices to study fluid dynamics.

Head's customers are as far away as Australia and Israel. Head's instruments are known as some of the most accurate and specific, measuring temperature change in water down to the millimeter, in five-second increments.

Stratification is important because it shows how much oxygen is needed in a reservoir or lake for fish to survive; it can determine water temperatures in the middle of a hurricane; and it can be used to study currents such as the Gulf Stream.

Precision Measurement Engineering's most popular device is the Lake Diagnostic System, or LDS, and it looks like a giant extension cord with temperature sensors attached to it.

"I'd say for that temperature string, others have tried but his is by far the best," said Joel Hazard, development engineer at Scripps



DAN TREVAN / Union-Tribune
Precision Measurement Engineering technician Ryan Reschan puts a mold together as he prepares components of the Lake Diagnostic System at the Carlsbad company.



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Institution of Oceanography.

Scripps has attached the LDS to several piers and buoys in San Diego for coastal research.

“The stuff that wins Nobel Prizes in one century is for tinsmiths in the next. We're tinsmiths,” Head said. “We just take these things that people have figured out and we just tinsmith them away to make useful systems.”



DAN TREVAN / Union-Tribune
Precision Measurement Engineering CEO Michael Head tests an oxygen sensor that will be used in the company's Lake Diagnostic System.

Head, 56, has been a tinsmith for 25 years. After attending Scripps, where he built temperature sensors for his doctoral dissertation, he founded Precision Measurement Engineering in 1982.

Head then began selling the measurement devices out of his garage with the help of his wife, Sandy. During most of the 1980s, he worked full time as a computer programmer. In 1991, Head said, he finally had built up enough customers to make Precision Measurement Engineering his main business.

Not long after, Sandy, 56, became a full-time partner and the company moved out of the garage to a small office and workshop in Carlsbad.

“Business is business,” said Michael Head. “You can sell soda, you can sell shoes, you can sell scientific instruments.”

Head and his company are building research instruments that are used on the forefront of global warming research.



DAN TREVAN / Union-Tribune
Kristen Head tunes an antenna that will be used in an ARGO satellite.

One of the company's most interesting projects is a global climate model called ARGO, or Array for Real-Time Geostrophic Oceanography. ARGO is made up of thousands of floating buoys around the world's oceans that collect data, which then is sent via satellite to researchers.

The floats will give scientists a better understanding of what weather will be like in 10 to 20 years, Head said.

One of ARGO's goals is to measure how much freshwater has entered the oceans from the polar ice caps. ARGO is a collaborative effort between several countries. Most of the United States' buoys come from Scripps, which uses antennas from Head's company to transmit the data to satellites.

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Each antenna costs about \$350, and Precision Measurement Engineering plans to send 40 to Scripps this month.

Still, Head said he never got into the business for the money and for years it was barely profitable.

“If I had the 25 years back and I knew what I know now, I probably wouldn't do it,” he said. “Our first year I think we did \$4,000.”

Precision Measurement Engineering has seven employees, including daughter Kristin Head, 24, and has an annual gross revenue of \$450,000.

The small temperature sensors that Head makes cost about \$430. The sensors are usually sold on the Lake Diagnostic System, which costs between \$20,000 and \$30,000 depending on the length.

Head said he wants to continue to add products and grow volume to the point where he possibly could sell the business.

Another possibility is for Kristin, who graduated from the University of California San Diego and is returning to school for a master's, to take over.

Head said Precision Measurement Engineering is more profitable today than it has ever been.

“Businesses are like cancer,” said Head, who approaches business like a science experiment. “They grow at a fraction of their size. If you do the math, it doubles and then doubles again and again.”

For information, go to www.pme.com.

■ News assistant David Berlin is on the lookout for North County business stories. You can reach him at david.berlin@uniontrib.com or at (619) 293-2079.

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