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**The Tiny-Specialists Are Actually Quite Big  
Technology from the PI Group in Karlsruhe, Germany Enables Space Research and the Fight  
against COVID-19**

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In Karlsruhe, Germany, Albert Einstein is present every day! The following quote by the physicist is visible on the revolving door of the company Physik Instrumente (PI) GmbH "Imagination is more important than knowledge, as knowledge is limited". In Stupferich and Palmbach, the attractive hill-side villages around Karlsruhe, approx. 60 of the 670 PI employees are physicists with doctorates.

In the corridors of PI's premises, members of the company's photo club exhibit their photos which show images of Singapore and San Francisco, amongst other places. This is symbolic as, on land, in water, and in the air, PI's product solutions play a role on a global basis. They even enable the vastness of Space to be discovered. Additionally, according to PI's CEO Markus Spanner, PI also enabled the COVID-19 virus to be decrypted so quickly. "At the end of the day, 90 % of globally-leading companies are our customers."

Markus Spanner is an economist and can explain the complicated PI material so that even non-physicists understand: "In the true meaning of the words, we spilt hairs", he says, and is amused by the comparison. "If you want to divide a hair by 80,000 then that is exactly what we can do." PI's precision technology can position such a minute item highly accurately.

"PI enables movements with precision in the micro and nanometer range" says Spanner.

Just now, he was in the company's showroom, pointing to the Lego model of the largest optical telescope that should start operating in the Chilean Atacama desert in 2025. It has 798 mirrors.

PI technology positions each individual mirror exactly and the Karlsruhe company also provides the cables and controls. Up a few floors in the building, Spanner shows us the cleanroom behind some glass panels. Many of the employees are sitting at computers. Further behind them, there are colored boxes with materials. This is where the PI devices are assembled.

Here, the way of working is everything but hectic. It also should not be when aiming for the greatest precision. At the moment, an employee is sitting in front of a mini-box on top of some aluminum foil, and bends over it, and moves the thin cable into place with some tweezers.

PI can manufacture individually, for example, for universities, but can also mass-produce. "At PI, there are no splinters or loud machines to be heard", explains Spanner.

In addition, the depth of manufacturing is astounding. This is where the surface-ground granite plates from the Japanese plant and the controllers from Israel come into force.

In the meantime, PI has nine production sites and 16 sales subsidiaries globally. PI was a spin-off from the Max Planck Society. In 1977, Markus Spanner's father took over the Munich company PI, whose owner had passed away. He was helped by two other shareholders. Dr. Spanner relocated to Waldbronn and moved into offices from the company Polytec. Initially, PI was a one-man company.

As the 44 year old economist Markus Spanner says, PI now has more than 1,500 employees globally and invested 60 million euros in 2021 and 2022 alone without needing a bank loan. These are investments in the future. Digitalization, medical technology, automation: "Currently, lots of business sectors are exploding. Our future looks amazing. Our job is to make use of the opportunities." None of our global competitors has such a broad product portfolio as PI and can combine so many different drive technologies with each other. This makes it possible to develop individual solutions for customers. Therefore, Einstein's quote from the entrance door really does apply as, at PI, thinking something is not possible is not allowed.

In the high-end auditorium, PI's engineers and customers ponder over solutions. Alternatively, these are presented globally from the "Greenroom Studio", a technology also used in German TV news shows. Although Markus Spanner is not really allowed to name any customers, when PI says they work for Cape Canaveral or for a sports car manufacturer in Italy, we already have an idea of who is meant.

Often, for world corporations, PI is meant to stay behind the scenes. For example, in the case of high-end smartphones. Next, Markus Spanner takes his smartphone out of his blazer pocket. Then, he tells us why this device could not exist without PI: Thanks to PI, the lenses of the camera are positioned exactly, and, with PI's support, the casing is cut exactly, and correct mounting of the display is checked. Additionally, thanks to PI technology, the chips, storage media and image stabilizer work.

Speaking of chips: Currently, on a global scale, 144 new semiconductor plants and production lines are being built or planned. According to PI's press speaker Markus Wiederspahn "PI is part of almost all projects with components and systems". Markus Spanner emphasizes that "Due to the mixture of business sectors and countries, it doesn't really bother us if one market becomes weaker".

PI's own subsidiary checks the world market for trends. There will still be individual manufacturing, for example from the company's internal manufacturing. Markus Spanner explains his strategy, "Nonetheless, large series is the market". He sees huge potential especially in Asia and the USA. Currently, delivery chain problems are annoying him. Additionally, this year, he would like hire staff for 240 planned jobs which will be difficult.

Every day, thousands of people drive past the PI headquarters on the A8. Unfortunately, too few know what is behind the letters "PI" on the building.

Speaking of motorways: When high precision is as important as it is to PI employees, it is also always necessary to measure (again). When things need to be super precise, the engineers go into the cellar.

In the cellar, there is a vibration-free measuring room with its own foundations and when a lorry on the A8 drives over a hole in the road, down there it will not affect the engineers' work.

Later, Markus Spanner meets Marco Vogel, Head of Production Management for hexapods. Hexapod might sound a bit like witchcraft to an ordinary person, well yes, with their technology, PI can also somehow perform magic. A hexapod is a machine with six drive elements. At PI, they are the size of the palm of the hand or might weigh three tons. Mr. Vogel and Mr. Spanner talked about hexapods that hold the doors of vehicles in car factories for highly accurate assembly, or about glass fibers which a hexapod joins back together exactly. About hexapods in space telescopes in Chile and in Hawaii. About image stabilizers in cameras which would be unthinkable without hexapods. About hexapods that make exact radiation treatment of tumor patients possible.

When Mr. Vogel shows the laboratories at PI through the panes of glass, we can mainly see men and women in white coats whose work literally moves the world. "What we do is the limit of what is physically possible", says Spanner. The Nobel prize winner Albert Einstein would have liked this attitude. What is the other saying from the Nobel prize winner on PI's revolving door again? "Problems can never be solved by thinking the same way that caused them."

#### Company Business Card

- Physik Instrumente (PI) Group (Karlsruhe)
- Founding year: 1970
- Solutions: High-precision motion and positioning systems in the micro and nano range
- Chief Executive Officer: Markus Spanner
- Turnover: 243.8 (2020: 192) million euros
- DACH region's share of turnover: 29 % (2020: 32 %)
- Results: n.s.
- Production sites: Germany (4), USA (2), Israel, China, Japan
- Employees: 1,433 (2020: 1,300)
- [www.pi.ws](http://www.pi.ws)

Caption: Highest precision: Production workers at PI require finesse. The company from Karlsruhe is a global market leader in their field.

Image: Andrea Fabry