



## **3D Laser Triangulation: Precision Touchpad Placement**

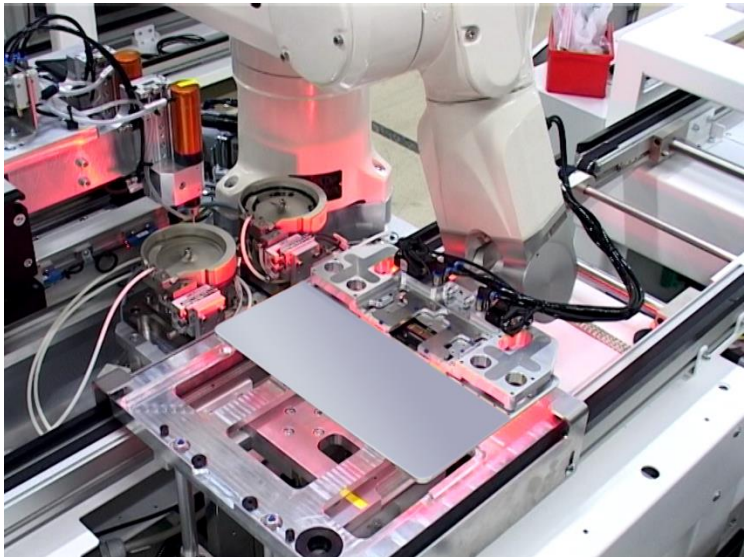
**Reutlingen, Germany, December 1, 2015. High-tech equipment manufacturing for future growth markets: "Electronic Components," "Electronic Devices," "Solar," and "Energy Storage" are the core business areas of Manz AG. Our expertise is based on seven core technologies: automation, roll-to-roll, metrology, printing and coating, laser process technology, wet chemical processes and vacuum coating. Today: Our expertise in metrology, using the example of laser triangulation for taking three-dimensional measurements of touchpad pockets during notebook production.**

Just a few micrometers can make the difference between a notebook being perceived as high quality or cheap. Premium manufacturers therefore place great value on the keys having exactly the same height and on gap dimensions between the touchpad and the housing recess being imperceptibly small. So far, expensive, time-consuming manual adjustments have been necessary to get the keyboard and touchpad to fit perfectly. In the future, this will be automated and highly precise thanks to a production solution from Manz. Laser triangulation is used to determine not only the alignment and height of each individual key, but also the height of the touchpad and depth of the recess for the touchpad in the housing – the so-called touchpad pocket. Both dimensions will vary as a result of production-related variations. This process, proven in optical metrology, uses both values to calculate a required height adjustment through a 3D matching process and automatically insert the right shims. This allows the touchpad to be inserted with great precision.

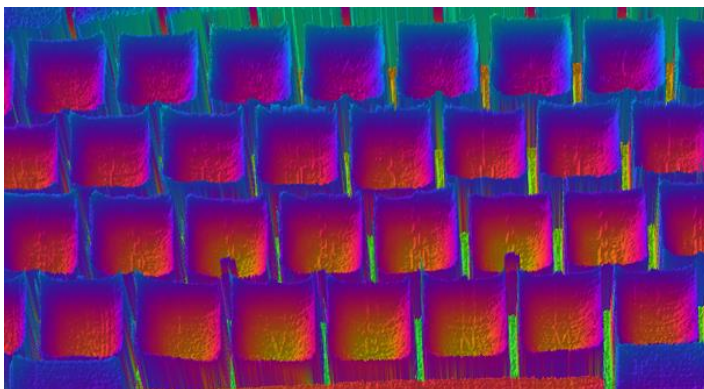
Notebooks are assembled at such a fast pace that the measurement has to take place within only 11 seconds. A sensor head throws a fine line of blue light onto the object, and a camera positioned at an angle measures the reflected light. Height differences, such as between touchpad and housing, appear in the image as steps in the line of the reflected light. The measurement precision is 20 micrometers. To meet the challenge of the fast measurement cycle, the equipment was furnished with two sensors that have slightly overlapping ranges. Measuring a housing produces 200 megabytes of data, which is then processed in five seconds by an image processing software suite from Manz.

The Manz 3D measurement stations have been used in serial production by four customers in the electronics industry since March 2015. The equipment is part of an innovative modular assembly system, called Light Assembly, for electronic products such as smartphones, tablet computers or notebooks. The system is made up of compact, freely combinable modules – including modules for materials handling, screwing, laser inscription or final inspection.

[www.manz.com](http://www.manz.com)



**Photo 1:** Two laser sensors measure the depth of the touchpad pocket on a notebook housing.



**Photo 2:** In addition to the depth of the touchpad pocket, 3D laser triangulation can also be used to measure the topography of a notebook keyboard.



A detailed description of Manz 3D laser triangulation can be found in the 5/2015 issue of **inVision** magazine from renowned publisher TeDo Verlag: [www.invision-news.de/artikel/103633.htm](http://www.invision-news.de/artikel/103633.htm)

Photos in print resolution are available from Stefan Richter, Storymaker GmbH: [s.richter@storymaker.de](mailto:s.richter@storymaker.de), tel.: +49 (0)7071 – 93872-213.



## **Company profile:**

### **Manz AG – passion for efficiency**

As one of the world's leading high-tech equipment manufacturers, Manz AG, based in Reutlingen, Germany, is a pioneer in innovative products for fast-growing markets. Founded in 1987, the company has expertise in seven technology sectors: automation, laser processing, vacuum coating, screen printing, metrology, wet chemical and roll-to-roll processing. Manz deploys and continuously develops these technologies in three strategic business segments: Display, Solar and Battery.

The company is led by founder Dieter Manz and has been listed on the stock exchange in Germany since 2006. It currently develops and produces in Germany, China, Taiwan, Slovakia, Hungary and Italy. It also has sales and service branches in the United States and India. In early 2015, Manz AG had approximately 2,000 employees, about half of them in Asia. Manz's claim "passion for efficiency" offers the promise of production systems of the highest efficiency and innovation to its customers in dynamic, future-oriented industries. With its comprehensive expertise in developing new production technologies and related machines, the company substantially contributes to reducing production costs for end products, making them accessible to large groups of buyers the world over.

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