



## SiTek RoHS Compatible

As most are aware, the new RoHS directive 2002/95/EC came in to place on 1st July 2006. The directive bans the use of certain harmful substances in electronic components. For the past couple of years SiTek has worked closely together with our suppliers to assure that we were well prepared for the 1st July. Our new products shown below are, naturally, compatible with the new RoHS directive as is the whole of SiTek's range of PSD's.

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**Electronix Scandinavia**

Components Electronics Production Testing & Measuring Embedded Technology

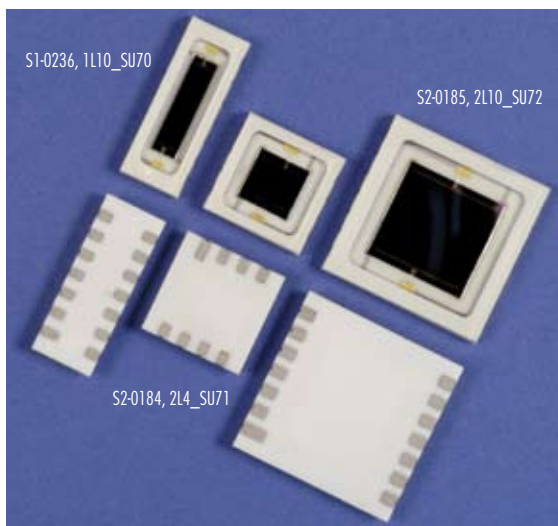
**5-7 SEPTEMBER**

**Visit our booth B05:41**

## PSDs available in SMD packages

SiTek can now offer a broader range of standard packages for our most commonly used PSDs. As an addition to

the different pin configured packages, our 1L10, 2L4 and 2L10 PSDs are now available as surface mount devices (SMD). The SMD package is made of the same high performance ceramic material as our other packages, with a thermal expansion coefficient close to that of the silicon chip. The new devices comes with our standard D263 glass window but can, as all of our other devices, be delivered with a custom designed anti-reflection coated window or filter instead.



## Broadened range of SPC-PSDs

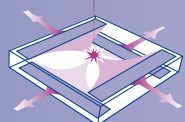
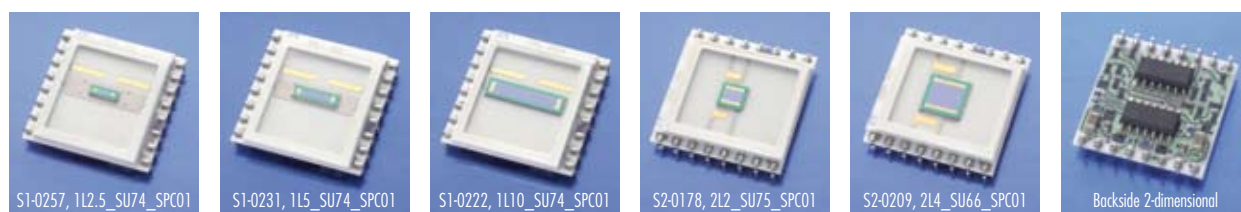
SiTek's range of PSDs equipped with attached signal processing circuit, SPC-PSDs, are now broadened to include not only the 2L10 PSD but also two of our other 2-dimensional PSDs, 2L2 and 2L4, and three of our 1-dimensional PSDs, 1L2.5, 1L5 and 1L10.

These devices contains all necessary electronics for biasing the PSD and extracting the position informa-

tion from the photo currents. The SPC-PSD circuitry converts the photo current to voltages using parallel transimpedance amplifier stages, supplies the bias voltage to the PSD and performs the sum and difference calculations. All the signals, sum, diff and converted photo currents, are available as outputs. Furthermore, inputs are available for external off-

set compensation of the sum and diff signals.

The use of thick film technology on ceramic substrate and laser trimmed resistors gives the SPC-PSDs maximum precision, high reliability and small size. The overall size of the devices are only 20.5 x 20.5 mm<sup>2</sup> and they come with surface mount leads and a D263 glass window.





## After 30 years

*After 30 years, the brainchild of Göran Pettersson and Lars Lindholm has grown into an established player on the optoelectronic market. Born of necessity at Chalmers University in 1976 (and creating a whole new avenue of technical applications), SiTek has managed to survive some hard times and evolve into a strong and profitable company both nationally and internationally.*

It's pretty much the dream of every graduate or undergraduate at a technical university – to open the door to a whole new way of thinking. Creating a new market. Be a true pioneer. Big words, but far from exaggerations. The modern PSD-technology (Position Sensing Detector) is estimated to employ upwards of 5000 people worldwide, and generate a global turnover of somewhere between 4 and 5 billion SEK.



*The King of Sweden, Karl XVI Gustaf, congratulates the founders.*

### Early days

When SiTek was formed on October 4th in 1976, PSD in itself was not a novelty. But reliable data from the devices, was. The founding concept behind SiTek was a modification to existing technology that allowed an 80% margin of error dwindle to 0.1%. With such an impressive debut, it is hardly surprising that the first couple of years were very prosperous. New PSD applications were continuously developed (among them the so-called triangulation or Optocatorsystem), and high-profile clients were racing each other trying to get on board. It didn't take long before SiTek outgrew the space allocated to them at the University. Bought outright by

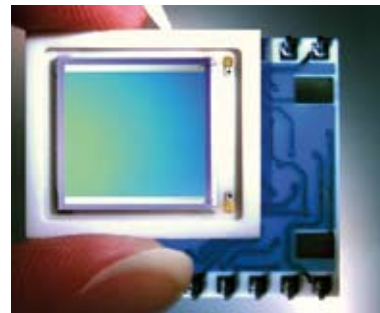
Ranginvest, the company relocated to a brand new custom-build facility with a modern clean room and a world of opportunities.

### Challenges overcome

The real challenge came in the mid-80s, when the recession (coupled with the fact that the market was not ready) made SiTek have to fight the good fight. And they were victorious. Sold to the present owners (japanese Autex Inc) in 1989, it took only a few years more to turn things around and from 1993, it was full speed ahead. SiTek went from lab work to being an internationally accomplished company with distributors and agents all over the world. Before the century had turned to a new, the personnel and turnover were both quadrupled, and the manufacturing potential was increased by a factor of 8. Naturally, such things does not pass unnoticed and in 1999 SiTek was awarded The Company of the Year by Swedoptronics.



*In-house PSD manufacturing at SiTek.*

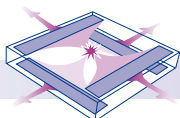


*SPC-PSD with integrated electronics.*

### The road ahead

The award is not the only sign that SiTek is doing very well nowadays. For instance, they have received the highest possible credit rating by Dun & Bradstreet annually since the year 2000, patented an array of innovative technologies and released a number of new standard products, for example the worlds largest standard PSD (2L45). The client roster boasts companies, both large and small, all over the world in industrial fields as diverse as medical, process, space and electronics. The applications range from the nanometer scale in Atomic Force Microscopes up to the hundred meter scale when measurements on bridges and buildings are done.

At SiTek today, spirits are high as the company celebrates its 30th anniversary. "The most important asset is our dedicated personnel, with their great knowledge and enthusiasm", says Conny Nordin, Managing Director. "They have been and will be the key factor to our success and we are really looking forward to the next 30 years with confidence and pride".



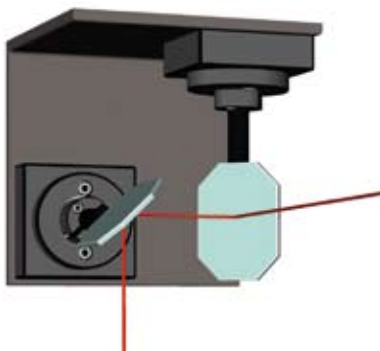
*Laser micromachining has for the last few years been widely used in the industry. Among others the electronics industry has, with its ever lasting need for denser circuit board structures, adopted the technique to achieve high density interconnects as well as in laser marking.*



## Outstanding laser micromachining technology uses PSD

The most flexible micromachining systems use the so called direct writing technique. Here the laser beam is guided to the position of machining and hence, the heart of such a system is the laser deflection unit. With high speed and excellent accuracy it must, with great repeatability, guide the laser beam to exactly the right position at exactly the right time.

A laser deflection system is principally made out of a motor block with two scanners, angle mounted, each equipped with a mirror on their rotary axis. The laser beam is reflected by the first mirror towards the second mirror and then towards the XY-plane. By regulating the angle of both mirrors, any x and y position in the XY-plane of the working field can be reached. A closed loop regulation assures the accuracy of the system.



*Figure 1. Principle of direct writing using rotating mirrors.*

Since 1988 the Belgium company Newson Engineering NV has been working in the field of signal measurement and control engineering. Their experience found its way into

a choice of high quality, leading edge products and in 2001 they patented the rhotor™ concept, setting revolutionary new standards in laser deflection.



*Figure 2. Newson Engineering's scanner unit rhotor™.*

In the rhotor™ scanner the mirror position measurement is done with a PSD. The SiTek PSD was chosen due to its good position resolution, excellent linearity and short response time. A LED or a laser is used as a light source. The light finds its way onto the PSD through a small hole in the rotor. When the rotor is turned, the projected light spot moves on the active surface of the PSD. This approach constitutes a flexible position measurement system. It is flexible because the angular range

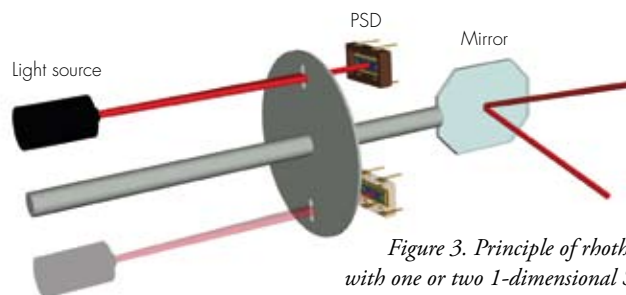
and resolution can be set by choosing the right PSD-size and location.

If a larger angular measurement range is required, one can use a PSD with a larger active length or place the PSD closer to the rotating axis. The angular measurement resolution can be increased by simply using a smaller PSD or enlarging the distance between the PSD and the rotating axis. The concept also enables a resolution improvement without reducing the angular range of the scanner if multiple PSDs and LEDs are used.

The PSD based solution is not only flexible but enables the fact that laser machines equipped with a rhotor™ laser deflection system raises both its speed and its accuracy. In fact, rhotor™ beam deflection systems are more than two times faster than the common moving magnet beam deflection systems and consume less than a third of their power.

So next time you take a look at a circuit board and realize that the microvias actually are thinner than a human hair, give SiTek a thought. Possibly the manufacturing has been guided by a PSD from SiTek.

*For more information about rhotor™ visit [www.rhotor.com](http://www.rhotor.com)*



*Figure 3. Principle of rhotor™ scanner with one or two 1-dimensional SiTek PSDs.*



## New employees



My name is **Mats Ensberg** I am 36 years old and I have been working at SiTek as a Production Engineer since May 2005. Before SiTek I was working at Ericsson AB in Borås, with the production of Mini-Link. At SiTek I also work with our clean room, where I do the particle measurement. I see the job here at SiTek as a new challenge for me.

One of my interests is long distance running and I practice 3 or 4 times a week. Also in my spare time I like to listen to music and spend time with my family, I have two daughters who are 6 and 3 years old.



My name is **Jani Ylén** and I work as a Production Engineer here at SiTek. I also have the main responsibility for the computers in the company. Before I came to SiTek I worked as an AV (Audio-Video) -technician at Volvo here in Gothenburg. Before that I studied Information Technology in Uppsala, where I was born and raised. I moved to Gothenburg in 2004 and I am planning to stay as I really like it here.

I have a big interest in computers and technology in general. I also enjoy good movies and especially classic horror movies like The Shining and Aliens.

## Meet us at Electronix 2006

SiTek welcomes all customers and suppliers to booth B05:41 on the 5-7 September at the Swedish Exhibition Centre in Gothenburg.

We are at your service with all available knowledge during these days so please take the chance to learn more about our wide range of standard PSDs. Also take a look at the new standard segments,

SPC-PSD (PSD with signal processing circuit) and SMD-PSDs (Surface mounted PSDs).

Let us explain about the special features our customised PSDs have such as stray light elimination, wavelength and sensitivity optimising.

We will present several applications showing our PSDs in action, and do not forget ...

... to take the opportunity to show your skills on our PSD based laser shooting range!

**Electronix Scandinavia**

We welcome you to our booth B05:41

Components Electronics Production Testing & Measuring Embedded Technology

## Coming exhibitions world wide

At the following exhibitions our distributors will be attending and you are very welcome to visit their booth and experience our products. For further information please contact our distributors or us.

Country/ City	Distributor	Date/ Exhibition
United Kingdom/ Stoneleigh Park	BFI Optilas Ltd info.uk@bfioptilas.com www.bfioptilas.com	18-19 Oct-06/ Photonex
The Netherlands/ Koningshof, Veldhoven	Promis Electro Optics info@gotoPEO.com www.gotoPEO.com	29-30 Nov-06/ Precisiebeurs
USA/ San Jose	On-trak info@on-trak.com www.on-trak.com	23-25 Jan-07/ Photonics West
Germany/ Nuremberg	Laser Components info@lasercomponents.com www.lasercomponents.com	22-24 May-07/ Sensor
Munich		18-21 June-07/ LASER