



# AoT-News

Following the recent launch of our new website [www.aotag.ch](http://www.aotag.ch) our Newsletter has been given a minor Facelift. We hope you find it interesting and enjoyable to read.

Please don't hesitate to share your thoughts, opinions or ideas with us. In any case, we look forward to hearing from you.

## Contents

The topics listed in the side banner will form the backbone of our newsletter.

### Under the Microscope

In each issue, we take a closer look at one of our engineering services. To get the ball rolling, we are starting with an overview of these services available.

### AoT Tech-Corner

Here we will turn our attention to something technical, and sometimes something new. Please let us know if you have ideas or topics that you would like to contribute, or that you would like us to discuss in this section.

### „Speed-Dating“ à la AoT

A popular theme in movies, "Speed Dating" is a quick method of getting to know people, which is now being analysed and recognised by academics. Through short interviews we will introduce the AoT team to you.

### News & Events

Art of Technology will be exhibiting at the following events:

In this Issue

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[Under the Microscope](#)

[Tech-Corner](#)

[„Speed-Dating“ à la AoT](#)

[News & Events](#)

**Embedded World**

01-03 Mar. 2011

Hall 12, Stand 12-144

Nürnberg, DE

**Electronica**

09-12 Nov. 2010

Hall B4, Stand 157/2

München, DE

**Arab Health**

24-27 Jan. 2011

Sheikh Saeed Hall 3

Stand S3E58

Dubai, UAE

**MEDTEC**

22-24 Mar. 2011

Hall 6, Stand 6686

Stuttgart, DE

October	November	December	January	February	March
Q4 - 2010			Q1 - 2011		



## Under the Microscope

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### Full Custom Development

We assume responsibility for the complete design and development process; starting from your idea or concept all the way through to production, including the supply of qualified prototypes.

With our partners we can also assist with, or provide you with volume production quantities.

### Individual Development Services

Missing a particular resource, know-how or simply a lack of manpower?

We can provide you with exactly the support you need. Each stage of the design and development process is available individually.

### Semi-Custom Geräte

Why pay the full price for a product (or design) that is very similar to something that already exists? We offer standard building blocks that include basic functions that can be quickly adapted to include the specific functionality you want - for a fraction of the normal price.

Currently available are GPS building blocks that can be used as the foundation for your semi-custom product. Other modules will be added on an on-going basis.

### Consultancy Services

This ideal solution if you want to use your own resources but are not sure how to start and want some support, or just a second opinion!

For further information about Art of Technology, our services and a selection of customer projects, refer to [www.aotag.ch](http://www.aotag.ch).

### An Offer

you simply can't refuse!



Art of Technology makes you an extraordinary offer:

#### **Free Workshop**

*In a free two-hour workshop we will analyse your project and your needs with you.*

To take advantage of this special offer, click here:

[Free Workshop](#)

We will contact you to arrange an appointment.

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This offer is restricted to the first 10 people to register.



## Tech-Corner

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### 3D-Technologies on the Rise

by Thomas Schwinghammer

During the past two years, MID technology has experienced a real boom. In Asia there are already several high-volume projects in production and the demand is growing fast in Europe.

Art of Technology has developed a 3-Dimensional Sensor System and accumulated detailed know-how that we want to share with you. It may even help to make your project feasible.

#### What is 3D-MID?

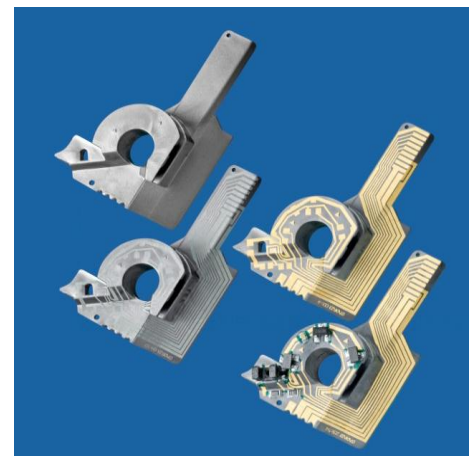
MID stands for Moulded Interconnect Devices, i.e. circuit boards made of plastics, which are produced by injection moulding. The MID method can be prepared via 3-dimensional circuit carriers, which combine electrical and mechanical functions.

MID's can be created using various methods. The LDS method is of particular interest because it is especially suitable for prototypes and small quantities.

#### LDS-Process

Using the LDS method, MID-modules can be produced in only four steps:

1. Injection moulding
2. Laser activation
3. Metallisation
4. Assembly



Four Steps of the LDS-Process  
Source: HARTING AG

The LDS process uses conventional thermoplastic materials such as polyimide and polyester doped with a special metal-plastic additive. The additive is activated during a laser-structuring process forming a micro-rough track where the laser beam hits the plastic. The metal particles of this track form the nuclei for the subsequent metallisation process, during which the tracks are converted into tightly-toleranced conducting paths in an electro-less copper bath. Successive layers of copper, nickel and gold can be deposited as required.

Although the LDS method is normally used for small piece-parts with a machineable volume of approximately  $160 \times 160 \times 24 \text{ mm}^3$ , larger parts can also be processed by simply repositioning the support-clamps. Although conducting paths of  $150\mu\text{m}$  with  $200\mu\text{m}$  spacing are very much state of the art, smaller widths and spacing for specific parts can be achieved via parameter adjustments. For small volume production grids of  $130\mu\text{m}$  are also feasible. On prints with small wall thicknesses the vertical interconnect access (via) can be drilled and activated simultaneously, with the laser, in one process step. The minimum diameter for vias is currently  $300\mu\text{m}$ . Using highly homogenous substrates, impedance controlled lines suitable even for data transmission can be realised.



## Assembly Techniques

All surface mounting techniques known can be applied to MIDs. This includes wire-bonding (Aluminium or Gold bonding) as well as Flip-Chip technology, which can be soldered or glued.

## MID Applications

Although still used mainly for mobile phone antennas, the use of MID technology in the automotive industry is growing steadily, e.g. as a steering wheel control switch in the BMW Z4, as well as a sensor system for air bags. Usage in the automotive market is an indication of the high quality and robustness associated with MID's.

Other applications include hearing aids as well as the medical and sensor markets. An increase of MID's is also to be expected in Logistics and RFID. Future markets are likely to be notebooks and even more probably netbooks.

In the absence of a high volume market, the most important factor is whether or not a technical advantage can be gained through the use of MID technology.

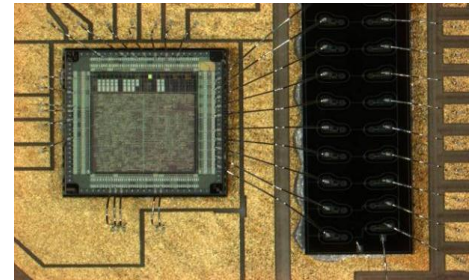
## Advantages of the MID LDS-Process

- + Reduced Space Requirements
- + Short Supply Chain  
(PCB and Assembly from one source)
- + Conductive Pattern can be modified at any time
- + Contact free process
- + Low production costs (higher initial costs)
- + Ecologically friendly

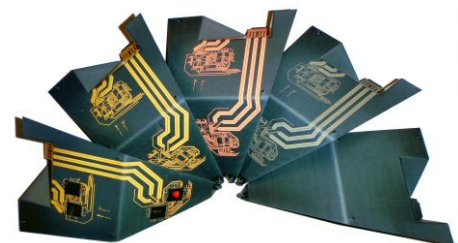
## Conclusion

Although MID Technology has been around for quite a while, the boom during the last 2 years has confirmed the viability of the technology. The main challenge of the MID technology lies in the integration of the individual steps that are normally executed at different locations.

Don't miss the opportunity to gain a crucial market advantage through the combination of your electronics and mechanics. Art of Technology is available as a partner to help you successfully realise even the most demanding projects.



Bonding on an MID-Substrate  
Source: HSG-IMAT



Varios Process Steps of a 3D-MID,  
Production: HSG-IMAT  
Design & Development: Art of Technology AG



## “Speed-Dating” à la AoT

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with Christoph Speck

Its 08:04 and Christoph has arrived at the office.

I've just sprung the interview on him, before he could even get to his desk. This is his and my first experience of "speed dating".

As he unfolds the napkin with his notes, it's clear that he prepared himself for the interview in a restaurant. Chris looks calm and collected, whether it stays that way, we'll see:

### Was drives you?

I'm fascinated by life; from things that grow and change and I love tasks that other people don't like - they hold a certain charm for me. For example solving problems; viewing things from different perspectives and things that demand a lot of patience such as grinding a stone into a form.

I'm also a bit of a connoisseur: nice clothes, art, painting, sculpture, concerts, a little socializing in the evening, good conversation.

### Describe yourself using 5 adjectives?

Quiet; persistent; open; understanding and reasonably intelligent.

### Which hobby would you never do voluntarily?

I can't think of anything that I wouldn't be prepared to try. I find everything kind of interesting.

### How do you spend your free time?

Meeting people, going to concerts, mountain biking in the mountains, hiking, climbing, Tai-Chi. I also paint a lot and go once a week Figure-drawing.



Christoph

Age	41
Occupation	Senior SW-Engineer
At AoT	since 2003
Star Sign	Pisces
Favourite Colour	Schwarz
Lucky Number	7



**How did you get in to Painting?**

As an engineer I was looking for a balance to work. So I registered for a correspondence course, where I was supervised by an artist. Then I met an artist living in Zurich which has since developed into a very close friendship.

**Your'e going to a Costume Party. How do you disguise yourself?**

As a pirate (Captain Hook), wild and [swashbuckling!](#)

**If you were an animal, which animal would you be?**

Without hesitation, Christoph says "Elephant", because of their quiet movement; they are neither hunter nor hunted but still have lots of presence.

**What 3 things do you definitely want to do in Life?**

I would like to write comics, but I don't because I would have to sit in front of a screen and then I would lose the balance to work.

**What annoys you?**

Things like ignorance, intolerance and senseless dominance. I'm very intolerant of intolerance. ☺

**Closing word**

During the interview, Christopher stayed absolutely calm. He's not only a gifted young painter, but also a very cool gent!

[100 Portraits from Christoph](#)

