



**FACTS**

**Customer:** ADAC-Luftrettung gGmbH, Germany's largest air rescue service.

**Challenge:** Every ADAC air rescue operation must be documented in detail – with an emphasis on speed, precision and efficiency. All the attempts at improving data entry during ADAC emergency doctors' deployment of PDAs or tablet PCs failed due to reasons of ergonomics and practicality. In addition, ADAC wanted to be able to graphically illustrate and digitally analyse the correlation between different medical factors. This was not possible with PDAs and tablet PCs.

**Solution:** "dotforms® rescue" from Diagramm Halbach is a digital emergency doctors' log and a digital pen based on Anoto Digital Pen and Paper technology. Diagramm Halbach also developed verification software with integrated handwriting recognition.

**Benefits:** The dotforms application enables fast and error-free data entry without any additional effort while retaining paper forms which accompany patients to the hospital. Data capture has become 4-5 times faster than before. Comprehensive analysis helps to improve medical quality management, since the captured data can be used as a basis for medical research.

# Digital Pen and Paper used by ADAC rescue service

## Fast entry and analysis of patient data

*"After a brief training, the solution was quickly accepted by the rescue staff. We were able to keep our accustomed way of working with pen and paper and didn't need to change the workflow."*

**Marcus Beckmann, project manager at ADAC-Luftrettung**

Every year, ADAC takes off on thousands of rescue flights in Germany. The documentation is of particular importance on each operation: location, time and patient data, including vital signs, must be carefully recorded. This information is needed for follow-up treatment in the hospital after rescue operations, for administration purposes and to settle charges with the various service providers, such as health insurance funds and insurance companies. Until now, all data was recorded manually, which took a great deal of time and effort. ADAC-Luftrettung wanted to find an efficient and practical

solution to speed up the documentation process and make all of the data available for other use.

**Mission impossible**

For this reason, various electronic data entry devices, such as PDAs, tablet PCs and a solution based on Anoto Digital Pen and Paper technology, were closely examined. The digital pen and paper solution from Diagramm Halbach was the most convincing choice due to reasons of ergonomics and practicality. The company developed the digital emergency doctors' log – "dotforms® rescue" – in collaboration

with ADAC-Luftrettung and the German army hospital Bundeswehrkrankenhaus Ulm (BWK Ulm). Verification software with handwriting recognition was also developed. This solution also met one of ADAC's main requirements – the possibility to graphically illustrate and digitally analyse the correlation between different medical factors during the time period of the medical treatment.

"Meeting the key demand for

documentation content, documentation quality, practicality and efficiency seemed like a 'mission impossible' when the development of the documentation system began", says Dr. Matthias Helm, initiator of the project, OTA, from the Department of Anaesthesiology and Intensive Care at the BWK Ulm and senior helicopter doctor at the air rescue centre "Christoph 22" in Ulm.

### Mission possible

During a three-month pilot phase, the "dotforms rescue" solution was assessed to determine its functionality, practicality, robustness, stability and the quality of data entry.

This was followed by a six-month pilot phase in which "dotforms rescue" was used to document all rescue operations carried out by a helicopter station.

"After a brief training, the solution was quickly accepted by the rescue staff. We were able to keep our accustomed way of working with pen and paper and didn't need to change the workflow", says Marcus Beckmann, project manager at ADAC-Luftrettung.

According to Dr. Matthias Helm, "The system proved to be highly stable overall – no disruptions or breakdowns of individual system components or of the whole system were observed at any time. The digital pen, in particular, proved to be practical – in terms of both its mechanical stability and battery life and its handling."

As a bonus, data capture with "dotforms

rescue" proved to be 4-5 times faster than when it was being done manually. ADAC-Luftrettung has now decided to use the "dotforms rescue" application at all of its 33 centres based all over Germany.

### The new solution – how it works

The new solution consists of forms with Anoto's dot pattern (the digital emergency doctors' log), a digital pen and verification software, that has an integrated handwriting recognition function. All information is entered into the forms with a digital pen. The digital pen looks like a normal ballpoint pen, but contains a tiny infrared camera and processor, which enables it to "read" and digitise information, as it is entered into the form. Information is transmitted from the pen to the computer by docking the pen. There, handwriting recognition is performed, after which the data is further transmitted to the hospital database.

The solution offers a versatile option for analysing the recorded data; a full picture is given of the patient's condition and his vital functions. Links that previously remained undetected are now becoming clear for the first time; the correlation between several factors, e.g. blood pressure, pulse and medication can be visualized. This knowledge is being taken into account in treatment guidelines and can thus improve the quality of treatment in the long term. The recorded data is also used as a basis for medical research.

### Partner profile

*Diagramm Halbach was founded in 1832. With over 300 employees the company is dedicated to forms solutions for automatic data capture and digital services. Being an Anoto partner right from the beginning, Diagramm Halbach is an experienced service provider for digital pen and paper solutions, offering smart and complex solutions under the brand "dotforms®". dotforms® solutions are always harmonized regarding solution efficiency and paper functionality, as Diagramm Halbach is a certified print provider too. Based on proprietary handwriting recognition with highly efficient verification front end, the offering covers solutions for local, intranet or Internet use. The dotforms® web portal enables ASP applications as well as new digital services for digital pen and paper.*

[www.halbach.com/dotforms](http://www.halbach.com/dotforms)

### Customer profile

*ADAC-Luftrettung gGmbH was formed 1982, and has since become Germany's largest air rescue service. The helicopters of the non-profit-making organisation have over 45,000 missions every year. Today, ADAC is represented at 33 stations in Germany and has 45 of its own rescue and intensive care helicopters. Every day, the rescue teams are on standby in the densest air rescue network in the world. The machines are ready for takeoff in less than two minutes. Their deployment radius is generally 50 km. Medical treatment continues in flight. ADAC-Luftrettung gGmbH offers exceptional quality of treatment. The company is also a creator of opinion in the field of emergency rescue.*

[www.adac.de](http://www.adac.de)