



Interview: IAV's platform for the next generation of operator terminals!

Anja Meyer-Caspari in conversation with:
Frank Büter & Dr. Tobias Töpfer

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Berlin, October 2023

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Interview partner:
Dr. Tobias Töpfer, Director Agricultural Systems
Frank Büter, Product Manager Operator-Terminals

Anja Meyer-Caspari: Today, we are meeting here at IAV in Berlin to discuss the topic of operating and display systems for mobile machines together with my two colleagues Frank Büter and Tobias Töpfer.

Frank is responsible as product manager for operating and display systems at IAV. Tobias is the head of our agricultural activities.

Today we want to talk about new product approaches, which will be shown at AGRITECHNICA 2023.

Frank, when you hear the topic of operating and display systems, you don't really know what is behind it all. Why don't you tell us a little bit what it is all about?



Frank Büter: The term operating and display systems may be a bit awkward. I think most people can imagine more under the term terminal or user/operator terminal. It is simply about the devices that display the relevant data to the machine operator and allow him to set and monitor parameters on the machine. At IAV, we are the developer and supplier of such systems.

Anja Meyer-Caspari: Thank you, Frank, is the topic new to IAV?

Frank Büter: No, not at all. We have been on the market for many years and deliver our products very reliably. We have developed several generations of operator terminals and adapted them to the requirements of our customers. The focus of development was on hardware, i.e. electronics, display, housing, but also on software. When it comes to software, we distinguish between the basic software and the so-called application software.

The requirements for operator terminals are constantly changing. Our products must be up to that.

Anja Meyer-Caspari: Thank you, Frank. Increasing demands are, of course, a good keyword. Tobias, from the point of view of agricultural technology, what are the technical trends that must be considered in new terminal solutions?

Dr. Tobias Töpfer: Modern agricultural machinery has an increasing degree of automation. Nevertheless, there are more and more tasks and processes that the machine operator has to control and monitor via the terminal. This means that the demands on computing performance and the display area are increasing. The latter can be encountered by large central displays or by several displays distributed throughout the cabin, which are controlled, for example, by a main terminal. In any case, the display must be as high-resolution and brilliant as possible.

Having multiple "screens" available also increases the desire to use them to tidy up the cabin and rid it from physical switches. Controlling functions with safety relevance via a touch screen places high demands on an operator terminal. Hardware and software must be well coordinated for this.

In addition to the requirements of functional security, there is also the topic of cyber security. Future

generations of terminals must also be equipped for this purpose.

The topics addressed should represent a large number of requirements. The topic of operator terminals in agricultural applications is very demanding. I am glad that my colleagues have been able to build up such a wealth of experience over the years. Without this knowledge, it would not be possible today to talk about a new generation of terminals.



Anja Meyer-Caspari: Let's get more detailed: Frank, you as a product manager: What ideas do you have, what do you want to surprise your customers with?

Frank Büter: We have three main topics that IAV believes should mark a modern operator terminal.

Tobias, you just said that the topic of functional safety is a topic that machine manufacturers want. On the one hand, it is about reducing the controls, especially many switches and buttons, including their variety of variants, and on the other hand, about improving ergonomics. Ergonomics for displays that are subject to functional safety aspects is a challenge, but IAV can offer solutions for this. In addition to displaying safety-relevant content, however, the operability of machine functions, which are subject to the corresponding functional safety rules, and which are nevertheless to be triggered via touch screen, plays a very special role. Today, this is usually not possible because operating systems, drivers, and applications are not designed according to the rules of security standards. To change this, we have found ways to safely control functions via touch events in conjunction with a Linux application developed with QM-Level and our safety mechanisms.

In addition to the possibilities of implementing functional safety controls, IAV focuses on another major and critical topic. Through our activities in the automotive industry, we have built up a lot of know-how in the field of cyber security. We are bringing this know-how to the next generation of our operator terminals.

In addition, the EU is preparing very extensive rules for the data security of all kinds of electronic devices. If you look at the complex data management, the collection and sending of data with modern operator terminals, data security is therefore a very extensive and complex topic.

The solutions are diverse, starting with Trusted Boot, via encrypted databases, encrypted data communication at external and internal interfaces of the operator terminal, and ending with the conformist handling of personal data of the operators. In particular, data communication requires support from hardware elements. This enables the safety level to be achieved using the well-known methods of the automotive industry. We provide support for all of this with our new platform.

Thirdly, we as IAV know that the cabin of a working machine is practically the living room for the operators. The displays should therefore be easy to read, and the contents should be safe and of sufficient size. The machine manufacturer should have many options to display, and finally, the displays should look slim and elegant. So, we are talking about the greatest possible flexibility when connecting displays in terms of number, resolution and possible installation situations within the cabin. Of course, the cost-side differentiation of different model series also plays a role. IAV has developed a flexible system that, in addition to a lot of computing power, allows the connection of various displays. We can connect up to three displays in Full HD and additionally two displays, e.g. for displaying camera images. The control of a classic instrument cluster is a matter of course since the displays are connected via a serial link, their placement within the cabin is completely free. We have developed a system at the upper end of the performance class. IAV has also brought together the classic design of a "silver box" with the first display,

which is generally used as a basic equipment. This creates a classic all-in-one terminal for the basic equipment. This helps to save space and costs.

Just a word about the cameras: In the standard configuration, we have four digital Full-HD cameras, and these are not connected via Ethernet and thus do not cause the usual CPU load.

Anja Meyer-Caspari: Tobias, when will the ideas of IAV be visible in the machines?

Dr. Tobias Töpfer: A terminal is not sold off the shelf. The device must be fully integrated into the machine on the hardware and especially software side. We will develop the platform to a very well-considered point. This is then our starting point for a final customer-specific development. The solutions and also the cooperation model depend very much on the ideas and needs of our customers. But no matter how we get together. We want to stick to one thing: Our customers should always have a reliable and mobile partner by their side with us.

Anja Meyer-Caspari: Frank, next to the agricultural industry, where can your solutions still be used?

Frank Büter: In general, many commercial applications can be imagined here. The agricultural and construction machinery sector, but also intralogistics and municipal machinery are very high on the list. However, we are also not above special applications that cannot be classified into these categories.

Anja Meyer-Caspari: Thanks Frank and Tobias. Last question for you: AGRITECHNICA 2023 is just around the corner, potential customers can look at your idea there?

Frank Büter: Yes, of course. We will have an exhibit at our booth G34 in Hall 15 and of course also the experts who can answer all questions.

Anja Meyer-Caspari: Thank you, Tobias and Frank for the interesting interview. See you at AGRITECHNICA 2023!

