

## Bauhaus in preference to Baroque

Vision sensor software with visible user orientation

In 1919, Walter Gropius founded the Staatliche Bauhaus in Weimar, Germany. Even today, Bauhaus is a term that people frequently use in everyday language when design is to be associated with practicality and functionality. A practical, functional design – those are requirements demanded of current products so that they are easy to handle, easy to operate and can be set up in a manner that is easy to understand. And that applies as much to lifestyle products, such as tablet PCs, as it does to vision sensors in industrial image processing.

### Form follows function

From the American language, Bauhaus took up the clearly older “form follows function”. Although this guiding principle for design is being discussed even today, it is still seminal for a design where a human is the center of the product’s design. Of course, product design and user orientation have long included user interfaces or they even define themselves through them – the objective being that they are easy to understand and provide faster and more intuitive operability. For daily life, this is quite often put into practice by manufacturers through clear, usually company-internal design rules. For one, these style guides incorporate the usual usability standards, and for the other they take the specifics of the product into consideration. For a long time, image processing systems were considered to be the domain of a “closed society” of image processing professionals. The thought of “image processing for everyone” gave rise to the creation of vision sensors as “all-in-one” components for general use in production. Image-providing sensors, along with image processing hardware with the software required for it, illumination, optics and interfaces, everything is combined in a housing suitable for use in an industrial



User interface of VeriSens® software

environment. The objective here is to take an image processing system that has been shrunk onto the vision sensor component and into the machine just as easily as it was done with a light barrier or an encoder. The interfaces are comparable here, taking into consideration that currently a number of vision sensors are incorporated through digital I/Os. Based on this product idea, “form follows function” should be a bridge that is necessary for going from the complicated image processing system to the “uncomplicated” sensor. But is that how it is?

### From theory to practice

Having a basic understanding and knowledge of image processing is necessary still today when dealing with the implementation of an image-based assessment. Experience is required, in particular, for the adaptation of optics and illumination. Here, good consulting advice by the component’s manufacturer who has practical

experience, such as is being offered by Baumer, provides an advantage. To set the parameters, most of the vision sensors are connected to a PC – here, a sufficiently large display is essential for the visually optimized adjustment of the system. It is at this point, at the latest, that users will find out how marked the difference is between the user friendliness or at times even “user-unfriendliness” that was implemented in the systems available on the market:

- How quickly is a first-time user able to create a new job?
- Is the selection of the respective relevant functions clear?
- Does the user know, at any given point in time, in which interaction he is at that particular moment?
- Are operating errors a possibility?
- How quickly do users attain their objective – that of a functioning and tested application?

The current *VeriSens*<sup>®</sup> user interface is the result of long development work which, with numerous iterations, led from the first concept to “mock-ups” all the way to the software that was tested successfully. Key customers had the opportunity to test the clickable dummies. This way, unclear processes or interactions of the prototypes that could be misunderstood could be identified early on and reworked for series production and tested again. Proceeding in this elaborate manner has paid off. Today, it is standard procedure for new developments at Baumer, so that customers not only love to work with the systems – without mishaps – but so that they also gain additional time when products can be set up and operated easily.

### Start and feel comfortable as a recipe for success

Users who use the *VeriSens*<sup>®</sup> vision sensors are usually surprised at how quickly they feel at home in the user environment. Very often, new customers succeed in creating a first job within a few minutes. Feeling “comfortable” is important, because the user needs the security of always doing the right thing and not making any mistakes. To ensure this, uniform operating software is used for all models. For example, a first-timer who starts with the integration of a code reader of the ID series will later be able to effortlessly control a 2 megapixel

vision sensor with integrated flash controller, thanks to uniform standards. The user interface of the *VeriSens*<sup>®</sup> software is arranged clearly into working areas, where synonymous elements are linked into units (see image, page 1):

1. A tool bar with the image display options above the image display
2. An integrated help function that can be unhidden if required
3. The task bar leads you through the parameterization of a job in four steps. The parameterization area relevant for the respective step is arranged below
4. The device setting addresses the hardware
5. The test tasks can be managed and tested in the job menu

Superfluous notifications or queries are avoided wherever possible and what is unnecessary is omitted. What there is that is really indispensable for the user was hotly debated by the development team, in anticipation of the concerns of future users. Because, as easy it may sound to separate the important things from the unimportant ones, the most difficult thing is to be “straightforward”.

### Discovering hidden added values

If the first impression is one of “straightforwardness” that gives the user the



*VeriSens*<sup>®</sup> XC series with an integrated flash controller

secure feeling to be doing the right thing, then later on many users are surprised about the manifold functionalities of the *VeriSens*<sup>®</sup> software that is not immediately visible at first glance. The secret of “good” user interfaces based on reducing and organizing functions that are used seldom may be hidden if the important ones gain by this in their priority and are more easily handled by the user. The primary objective is to have different users, with differing experience levels be able to interact quickly, clearly and – last, but not least – in a relaxed manner.

### Solving applications as a whole

If vision sensors increasingly claim to be able to do “everything”, then that is in opposition to the original idea, to have a component that is oriented on the traditional sensor design. In the meantime, there are concepts crowding into the market that customers quickly label as “smart camera” and which have almost left the vision sensor category. One example for that is the new *VeriSens*<sup>®</sup> XC Series that, globally a first, even provides an integrated flash controller to control external illumination for complicated applications. But, can such a concept be parameterized in an easy and user-friendly manner? Fundamentally, additional features mean that there are, of course, more configuration options at first. However, taking a look at the overall costs for providing an application solution, it quickly becomes clear that things have to be parameterized somewhere, either way. For example, an external flash controller must be param-



*VeriSens*<sup>®</sup> vision sensors with integrated optics (right) and in C-mount design featuring an integrated flash controller (left)

eterized to the parameters of the connected illumination, such as e. g., voltage, power, maximum permissible flash time. And finally a flash controller must also be connected to the vision sensor and synchronized to image acquisition.

With respect to the *VeriSens*<sup>®</sup> XC, the integration of the flash controller markedly reduced the total expenditure and simplified it: The illumination is simply connected directly to the sensor. If illumination from Baumer is chosen, the suitable illumination profiles have already been integrated into the software as a selection for the device settings. Optionally, within the framework of the specification, the parameters may, of course, also be selected freely. By integrating the controller into the sensor practically all further requirements to set the software are dropped. Synchronization takes place automatically in line with the image trigger and the illumination – freed from manual settings and always

suitable for the chosen inspection task. Constructing a system intelligently can therefore help to reduce the adjustment control effort in the operating software without losing functionality. The user saves time through this innovative concept and gains more free space for his application solution.

### Conclusion

The drive towards consciously orienting design to the liking of the user is more than 100 years old. It is all the more an economic argument today that the parameterization of vision sensors must be done quickly, effectively and without errors to reduce valuable integration time to a minimum. Baumer *VeriSens*<sup>®</sup> has addressed this subject comprehensively, user-oriented and tested in practice. This makes it possible to implement image processing successfully and reliably for a large circle of users in a short period of time.



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