

## **With a network and a double base**

### **Client-specific sensor solutions in systems engineering**

Time and again, practical application examples back up the importance that sensors play in the trouble-free course of events related to different industrial processes. Even with the development of machines and systems, it is often not only client-specific solutions which are required, but also development specialists with the corresponding application expertise

Since 2004, H.S.T. Humpert-Sortiertechnik has been active in the field of commission sorting. Independently, the company from Arnsberg has developed and manufactured systems for this service without fail. As André Humpert (the CEO of both H.O.M. GmbH and H.S.T.) states “Over the course of the years we saw that the development and construction of measuring and sorting systems had the potential to become a business unit in its own right and as such, in 2008, we founded H.O.M. GmbH.”

### **A clever combination**

You could say that this was a contradiction: On the one hand, there is commission sorting as a service and on the other hand, the development and marketing of measuring and sorting systems. However, André Humpert sees it in a different light: “Those who decide to carry out the testing and sorting of parts themselves will end up having to purchase their own system. If the services of H.S.T. are not considered at all, the H.O.M. systems appear of greater interest. Not least because our customers benefit from our extensive experience in the field of commission sorting – a task that incidentally, is everything other than trivial.”

### **Technical and aesthetic standards**

Those who have seen a H.O.M. system will know that the likes of it cannot be found elsewhere. It is evident that the company places extreme emphasis on the high reliability of its measuring and testing systems. These technical standards are reflected in both the high-quality processing of even the smallest of system components as well as in the aesthetics of the systems.

### **Application expertise is required**

With regard to the high level of reliability of H.O.M.'s systems, the sensors form a central component. As André Humpert goes on to explain, “Our wealth of practical experience in commission sorting is further evidence that choosing the correct sensor solutions for specific areas of the system plays a crucial role in trouble-free testing and sorting processes.

For me, it is not just the need to source the sensors from one place which is obvious, but also the need to work with partners who have a wealth of application expertise, such as ipf electronic gmbh. This is absolutely necessary for our systems so that among other things, we can realize individual sensor solutions for various applications.” As examples, Humpert cites his glass turntable validation systems as well as the compact systems for measuring and sorting small parts.

### **A special solution for checking filling levels**

The requirement for high reliability starts with the introduction of the parts, e.g. by means of a vibration conveyor. For this, ipf electronic gmbh has developed a fill level control device consisting of a non-contact sensor and a pendulum which is suspended on a joint. (Fig. 1). In the frame of the joint there is an inductive proximity switch which via the pendulum – a type of plastic finger which extends into the conveyor – scans the parts in the container. If there are parts in the vibration conveyor, the pendulum is carried along by the flow of material. If the container is empty, the pendulum falls back to its basic position so that the inductive proximity switch is actuated thus triggering a corresponding signal which induces the filling process.



Fig. 1

### **A laser light triggers cameras**

The parts conveyed into the system by the vibration conveyor are deposited on the glass turntable via a belt that draws parts off the conveyor. In accordance with the test task and/or in accordance with the parts to be tested, the verification station itself can be equipped with up to ten cameras for measuring objects from different perspectives. In order to measure the objects correctly their correct positional arrangement needs to be known. As Humpert states, "This can either be assured via a deflector which is already in the feed system or alternatively performed via camera correction, by overlaying different programs". The cameras (Fig. 2) are triggered alongside the test process. This is done via a through-beam sensor which signals to the system that an object is in the test position. If an object is identified as not OK, its position must be traced in the further stages of the process. This is done in order to ensure targeted discharge to the sorting station. "For this, we use an ipf incremental transmitter which is integrated in the drive unit under the glass plate."

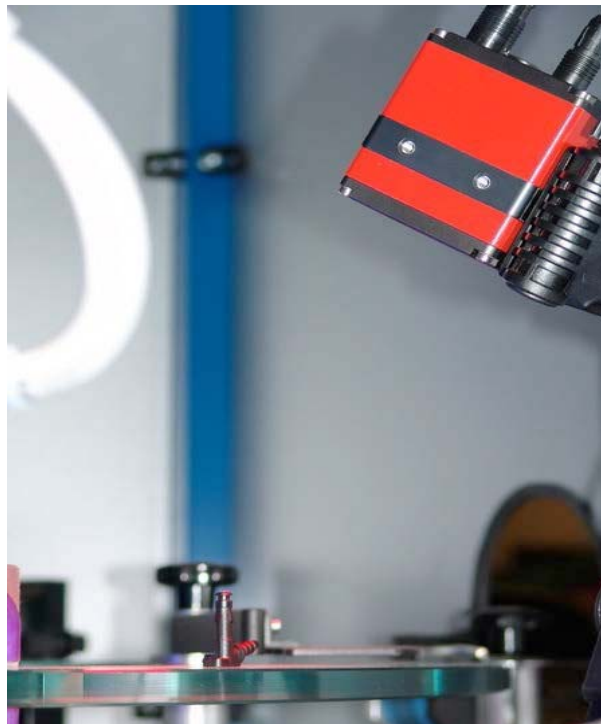


Fig. 2

### **Secure, correctly sorted sorting**

The rejection shaft is located on the sorting station at the height of the glass plate, for blowing off the parts which are not OK. A frame light barrier in the shaft monitors the actual rejection of the part which is not OK into a corresponding container. The fill level of this container is checked via an ultrasonic sensor. In addition, an optical sensor ensures that a container is also located under the rejection shaft.

However that is not enough: André Humpert explains, "As the parts to be tested are on a glass plate, there is not a fixed, defined position for them. If for example, two parts lie too close to each other, correct measurement cannot be performed by the test station. In order to ensure that such objects are not fed out of the system as parts which are not OK, there is a further shaft at the sorting station, via which these objects are channeled for re-testing in a separate container. This area requires the same sensors as the station where items which are not OK are blown off."

### **No costs saved when it comes to surveillance**

In this area of the system, the technical complexity of the sensors, that is to say "network and a double base", does not come about by chance. As the Managing Director of H.O.M. GmbH stresses, "Practical experience has taught us that in dealing with this sort of surveillance electronics, no costs should be saved". In terms of the business related to these specific systems, the particular task of ipf electronic was to identify suitable sensor solutions for the respective task and together with H.O.M., to implement these in such a way that the parts could be blown off into the correct containers. This naturally also applies to the part of the system in which the parts that are OK are channeled.

The channeling of the parts that are in order takes place via a separator (Fig. 3) and a slide which enters into a container in the rear section of the system. The parts are counted by means of a fork light barrier. Using another fork light barrier, a check is made to see if the slide does not form a material buildup. As André Humpert adds, "The decision as whether or not to monitor the slide using sensors is also taken based on our practical experience. If a buildup of material occurs (Fig. 4), this can lead to sensitive faults all along the testing and sorting process: Considering only the work that goes into selecting and designing the sensors on this specific system, it is clear how important it is to have a competent partner. Only those who understand the complexity of our validation and sorting systems and have the practical experience are able to really help us in the development and realization of systems. This is because it is not just selecting the right sensors which is crucial, but also their applicationspecific modification / new development – as and when this is called for."

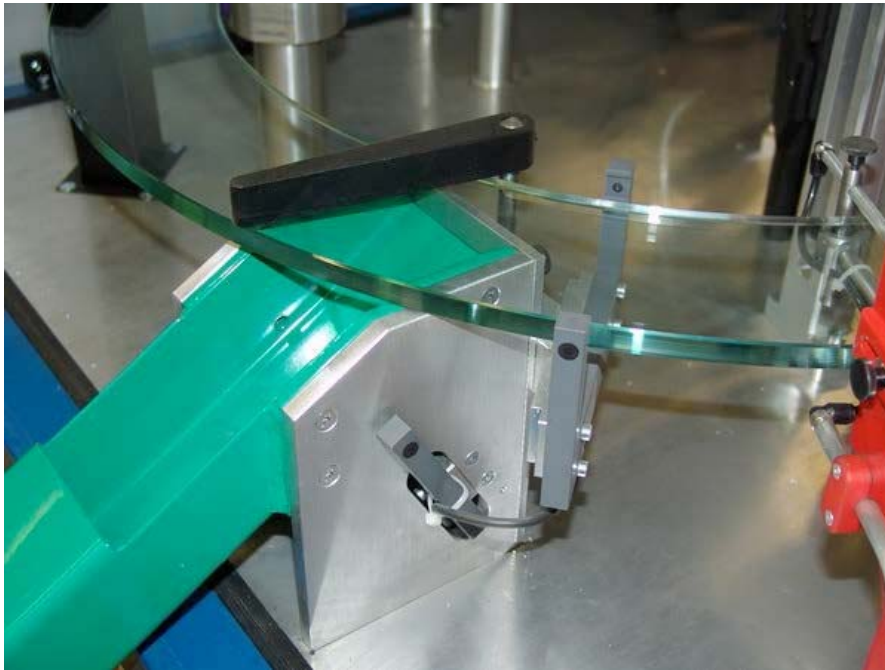


Fig.3



Fig. 4

According to André Humpert the collaboration between ipf electronic gmbh has already paid for itself at H.S.T. Humpert Sortiertechnik. "This is an example where we have jointly gained useful practical experience, and this is now being gainfully applied at H.O.M."