

# We keep an eye on your quality

The BT Master SC - automatic Inspection and Sorting System

# Inspection and Sorting of Stones and Heavy Clay Products

## The BT Master SC

The BT Master SC (Brick & Tile Master for Scanning and Sorting) is the next generation of our highly successful tile and heavy clay inspection system, which has proven its performance in some of the most modern brick plants in Europe.

The system contains a scanning unit, an evaluation unit and a sorting unit. The scanning unit is placed over the existing conveyor system; therefore there are no costly modifications necessary. The camera is equipped with all cameras, illumination, and depending on the model also with other components.



The BT Master SC scans the current processed production board and creates an image of all the located stones (bricks) and identifies its quality and location. Optionally, a 3D camera can be added to determine a height profile.

The evaluation unit is placed in a dust protected pc cabinet and is therefore ideal for the environmental influences of a production surrounding. With the use of the most modern color cameras and the modular design even flaking and cracks on embossed brick surfaces can be detected.

This system can be configured up to three different modules:

Module I: 2D camera module for optical inspection of surfaces, geometric shape verification and color measurement

Module II: 3D height measurement module for inspection of flappy or concave tiles, deviations, broken edges and more

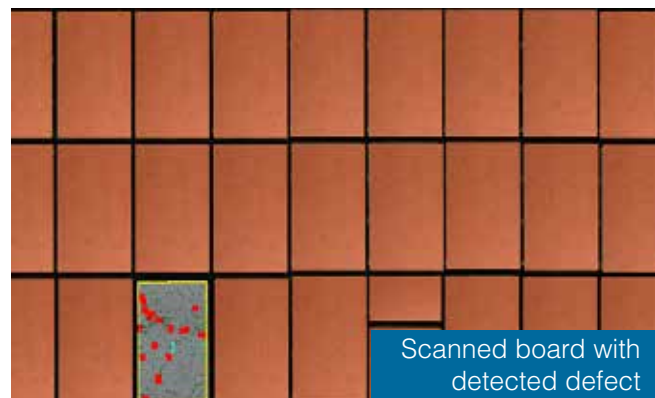
Module III: Sorting via a 5-axis robot

The quality is divided into different classifiers. This includes:

- Voids
- Corner Fractures
- Dents
- Contamination
- Cracks
- Color Deviations
- Texture Deviations
- Other anomalies

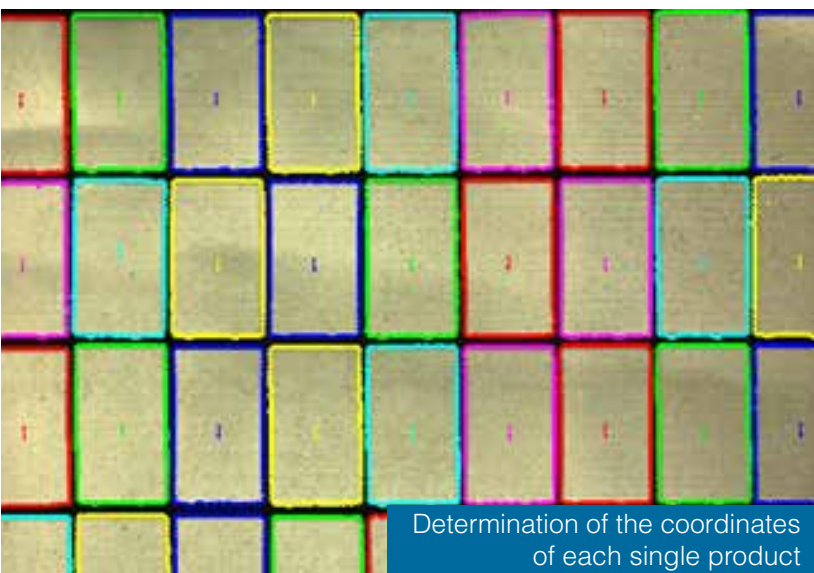
## Module I

This module contains our proven surface inspection methods, which are carried out with our line scan cameras (b/w or color). In this module an image of the surface is recorded while the products pass through and are compared to corresponding reference samples.



# Image Processing and Robotics in one system

With additive measurement of brightness and colors a control of these parameters is possible. Here, defective products that have in smaller areas color deviations and products that have a complete color deviation can be detected. Additionally to the inspection results, Module I also determines the coordinates of each single product on the production board and prepares this for module III.

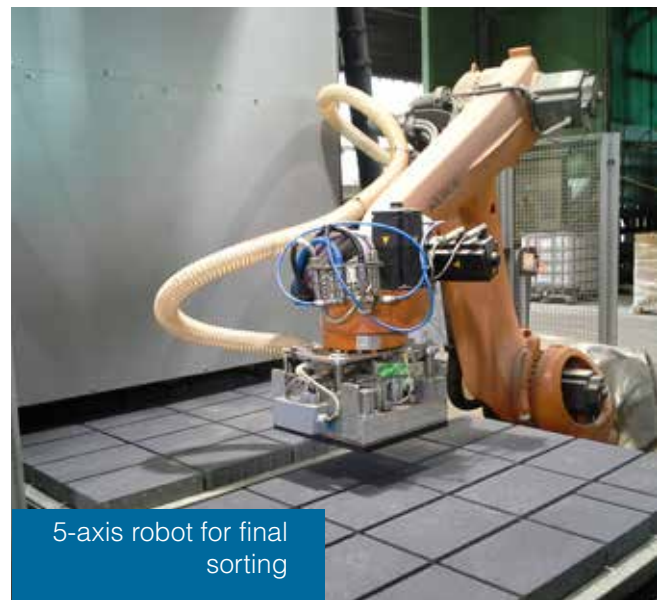


Determination of the coordinates of each single product

## Module II

This new 3D measurement module consists of a high-resolution 3D camera and a high-power line laser that creates a 3D image of the product. The recording is used to check dimensional consistencies and angularities. The length, width and height as well as the solid angle are measured. Flappy or concave tiles can be detected.

Conveyor or positional inaccuracies and the resulting perspective distortions can be configured and compensated with our intelligent in-house developed software. This feature is an addition to the statistic and helps to find serial failures to improve product quality. The measurement of the lengths, widths and angles are measured with an accuracy of 0,1 mm or 0,5° (depending on product size). The 3D module allows a speed of 150 products per minute (conveyor modus).



5-axis robot for final sorting

## Module III

The generated information from module I and module II is transferred to the optional robot controller via SPS, which controls the 5-axis sorting robot. The faulty stones are being logged and sorted out. Here the robot also generates sample bricks that are issued separately for later documentation. The extracted and sorted bricks are filled by corresponding good - bricks. These are provided beforehand.

In the end a product board with 100% good stones is transported further. The sorted NOK bricks end up in a breakage container. In the end the system covers the individual layers with foil or cardboard, labels them and puts a corresponding identifier code on the side of the pallet with the same robot. The robot is provided with a vacuum grabber that includes a vacuum matrix so that the different formats of the bricks and also e.g. 2 bricks besides each other can be grabbed. Little concrete crumbs are vacuumed up by the grabber, which ensures a stable vacuum.

# ibea - product quality systems

## Testing methods applied by ibea systems

- Standard image processing applications:  
inspection by camera of surface, texture, geometry, shape and dimensional accuracy, color, 2D and 3D measurement, holographic imaging, roughness, measurement of position and torsion, leak tightness
- Image processing, special applications:  
Heat-flow thermography by direct application of heat or ultrasonic initiation for structure checks, crack detection or the detection of other anomalies; UV light for fluxing agents or coating checks — crack detection, X-Ray
- Acoustic inspection:  
initiation by a hammer system
- Eddy current measurement:  
castings

## What ibea systems inspect

- Ceramic tubes, ceramic insulators
- NoX sensors
- Sprinkler glasses, Sprinkler bodies
- Glass ampoules, plastic ampoules
- Syringes, syringe parts
- Laparoscopes, Biopsy forceps
- Catheter, Artery tubes
- Toothpaste caps or shoulders
- Blister packaging, before sealing:
  - two-sided and for filling
- Tablets - color, cracks, size
- Silicone sealings and plastic sealings
- Metal packaging
- Plastic packaging
- Heavy ceramics and fine ceramics

## Put our know-how to the test

Feel free to send us samples of your faulty products that need inspection. Please give us a short description of your conveying system, possibly including photographs. Please also include conveyor speed and part rate. We will prepare a comprehensive offer specified to your needs, including needed accessories — all for an attractive price!

## About Ibea

ibea develops and implements inspection systems for a perfect quality check — modular, future-proof, and flexible. It is our aim to ensure a trouble-free production around the clock. Our focus is on producing systems, which are stable and maintenance-free. As a systems integrator we offer you comprehensive professional service from consulting to implementation.