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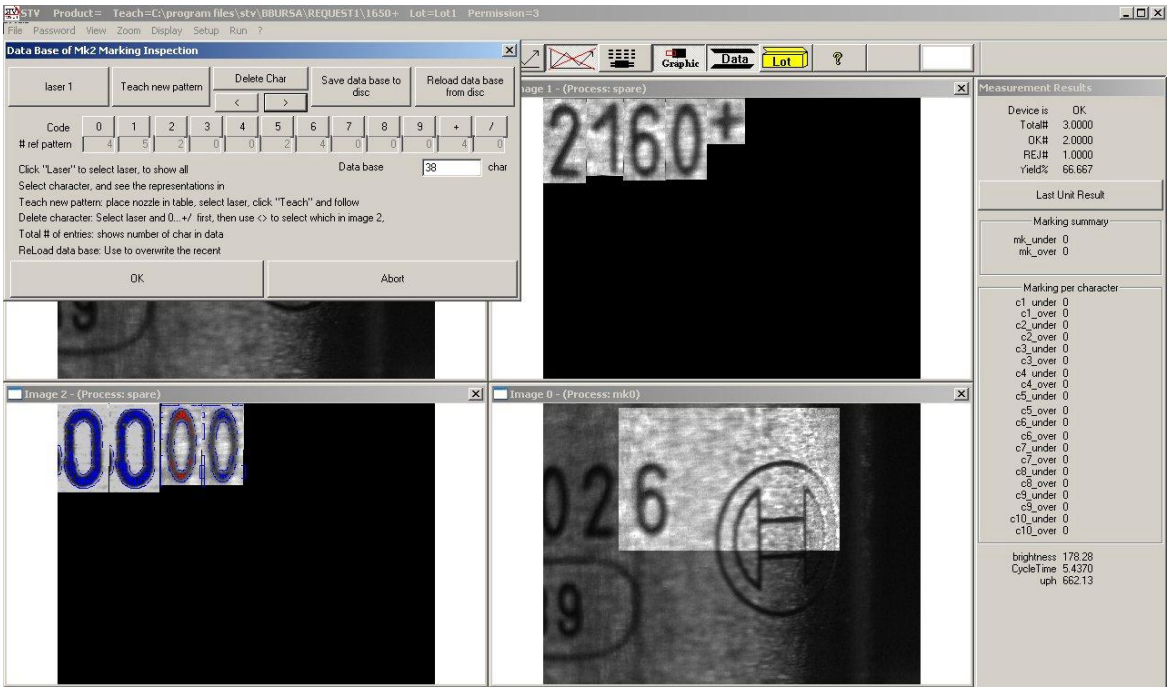
MK2 Marking Inspection System
For Moving or Rotating Devices
Dec 2013 STVision

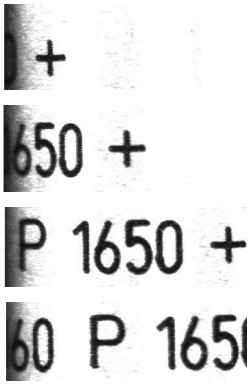


Inspection of Laser marked devices
For injection nozzles in steel
Robust results even for devices with oil contamination
Grabs a series of camera images in high speed
Auto detects the marking pattern location in these images
Collects individual characters
Reference is a data base of multiple pattern from various lasers
Easy editing of data base pattern
Multiple inspection systems refer to a common data base

Only one location to maintain or edit reference pattern
Supports different contrast from varying laser energy writing
OK / REJECT decision based on user defined tolerance setting
Direct communication with handler / robot
High speed
Stroboscope illumination, crisp images even for moving targets
Proven performance and reliability in rough environment

Operation Mode

Imagine a production line of devices which cannot stop for camera inspection. Or the devices must be rotated to view the laser mark position. The inspection of laser mark requires a new level of complexity: The camera must first find the marking in many images! For instance, see this image sequence:

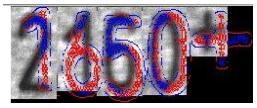


You want to check the marking “1650+”?

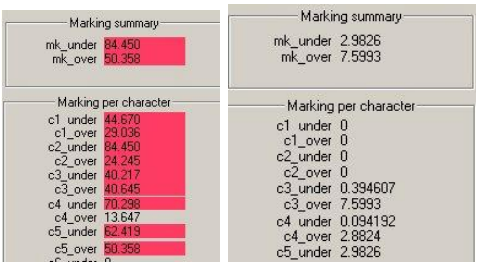
No problem: Here is the result:

The reference pattern (in blue) is in a pattern data base on the network. It includes all different laser writing styles, energies, light and dark marking, and even different sizes. Various spacing of characters is automatically corrected.

See this example of wrong marking device:



The bad pattern comes out RED. The result data show significant differences between the REJECT and the OK device on monitor:



SETUP: At installation, the system is trained for various reference pattern for all lasers, and stored in the central data base.

Production: Every inspection station catches the reference pattern for the actual production lot. Any modification in the laser type only requires one modification on the data base, and all inspection stations are automatically updated.

Images of moving targets normally show fuzzy contours. Therefore, the STV system includes a high speed strobe LED illumination ring for crisp images even at fast moving targets.
This system can be enhanced with additional inspection functions:

- Measurement of contour shapes, nozzles, cut-outs or any geometric parameters,
- Inspection of surface contamination,
- 3D measurements.

Camera resolution	1388 x 1038	Pixel
Camera speed	15	Images /sec
Image size	12 x 10	Mm
# of mark character	1…20	Micron
# of different laser pattern	10	micron
# of pattern per laser max	10	Micron
Max # of images / device	100	frames
Throughput per device	2	Sec
From # of image sequence	25	images
Robot interface	24V PLC	
Controller	Industrial PC	Windows7