

MÜHLBAUER AUTOMATION CURRENCY SOLUTIONS



Banknotes, Passports, Security Documents – One Inspection Solution for a Variety of Applications

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It's all about 100%



100% quality

100% security

100% transparency

100% trust in money





SHEET INSPECT

High volume, stand-alone inspection machine with complete sheet handling and inspection units



SHEET INSPECT lab

Inspection system for semi-automatic inspection of single sheets

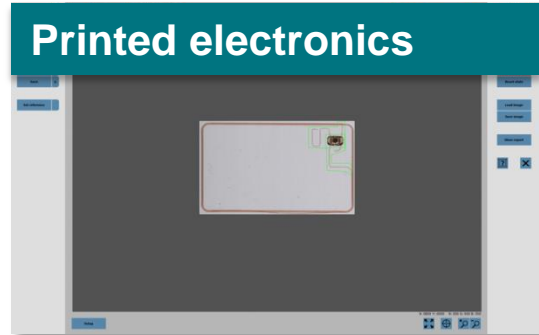
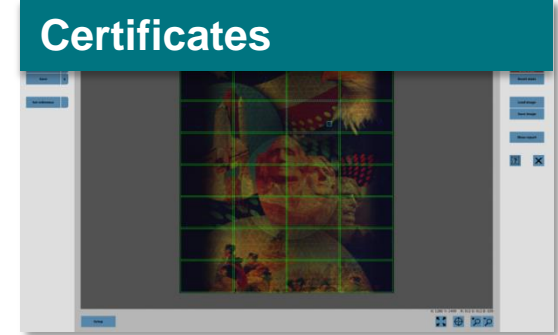
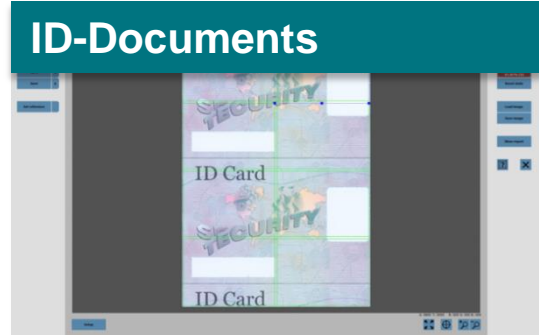
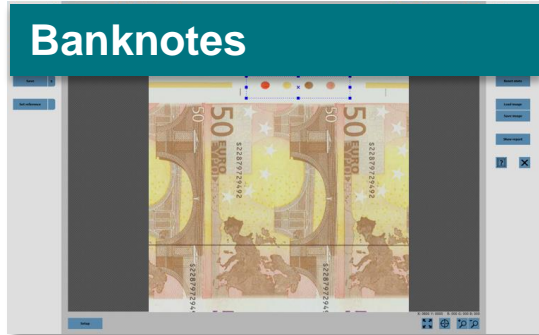


SHEET INSPECT number

Inline inspection system for serial numbers on banknote sheets



One Inspection Concept for a Variety of Applications



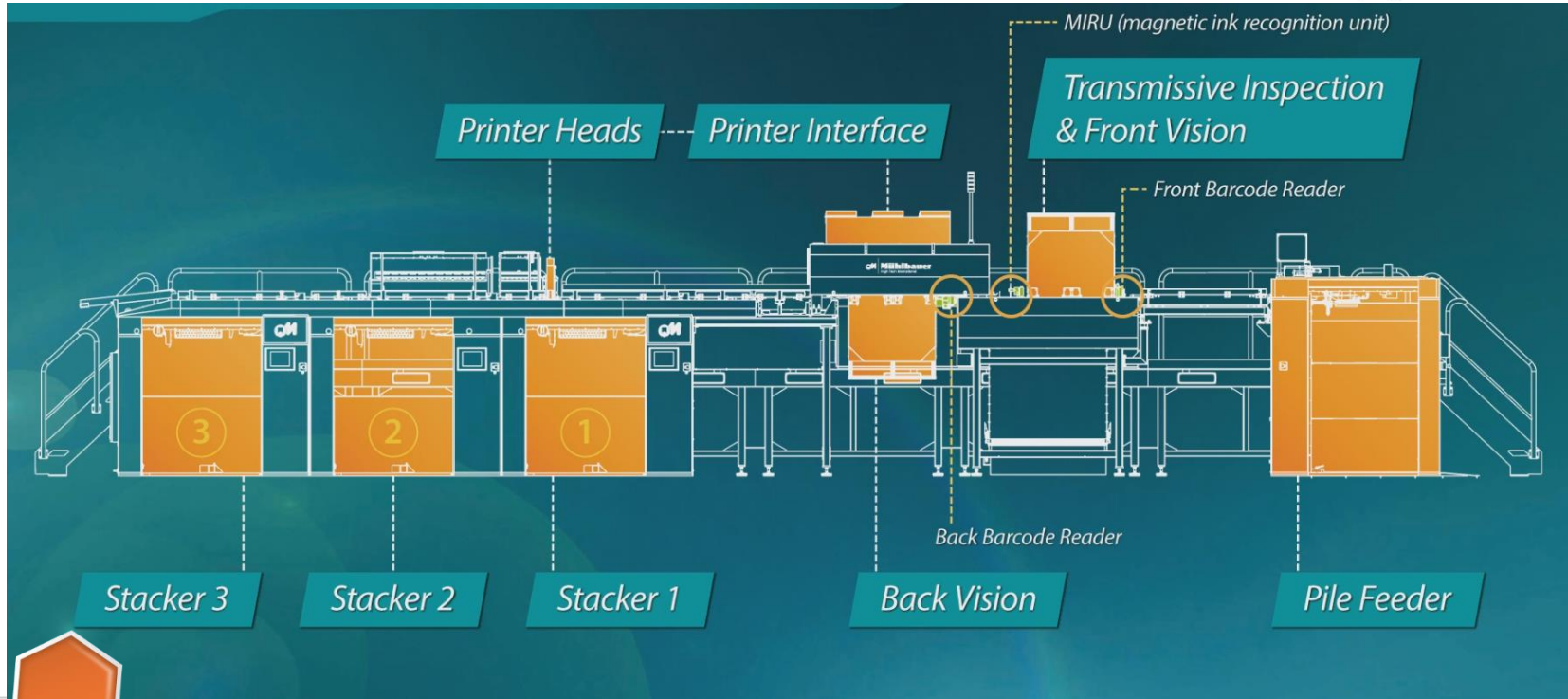
The modular Inspection System for Sheets



SHEET INSPECT



SHEET INSPECT Overview

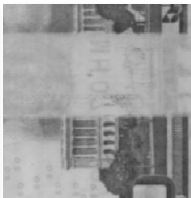
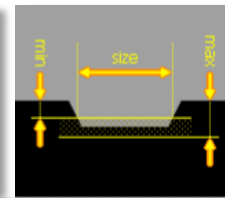


Areas of Interest – Inspection Criteria

- Sheet margin
- Sheet edge
- Offset print
- Intaglio print
- Screen print
- Special print
- IR-Print
- UV-Print
- Watermark
- Threads
- Foils
- UVI
- Magnetic ink

- Register print to sheet
- Register front to back
- Register print to print
- Quality of substrate
- Color measurement
- Presence and quality of watermark
- Presence, position, and completeness of security thread

- Correctness and integrity of micro print on security thread
- Correctness, completeness, and quality of print
- Presence and density of UV fibers
- Presence and completeness of UV and IR features
- Presence and intensity of magnetic ink



Special feature: micro print inspection on security thread



- **Visualization with UV light**
- **Inspection at full machine speed**
- **Comparison against acceptable pattern**

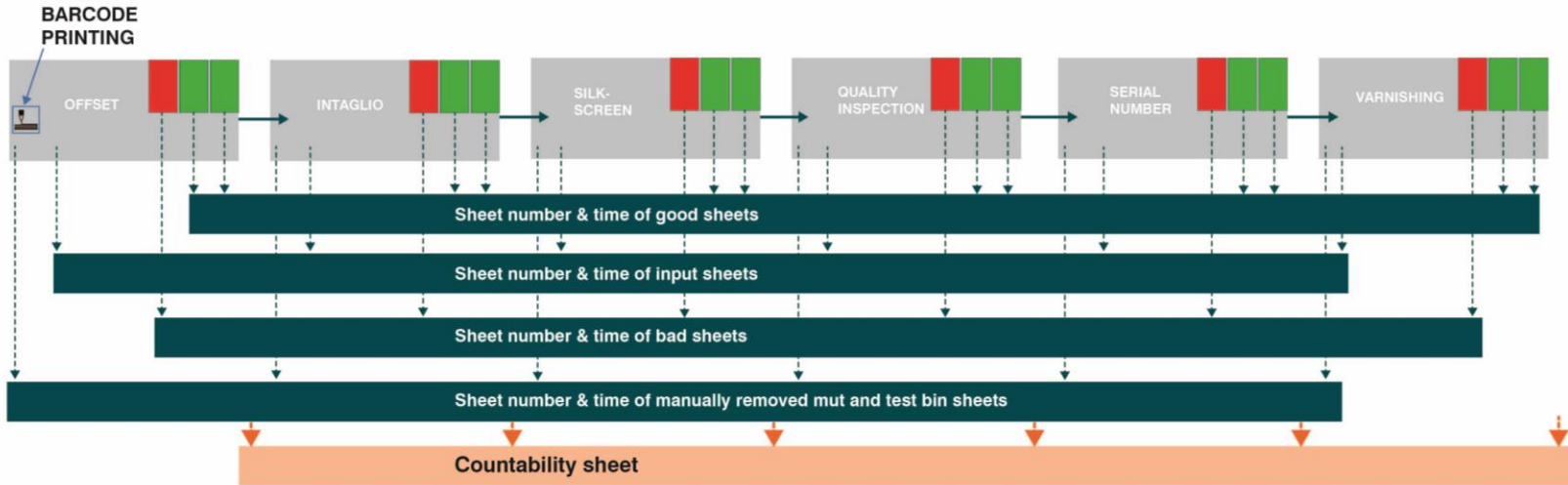
New method to inspect micro print on security threads
without reducing the machine speed!



100% security: Total control of every single sheet



Machine Park equipped with Track & Trace





Higher Efficiency

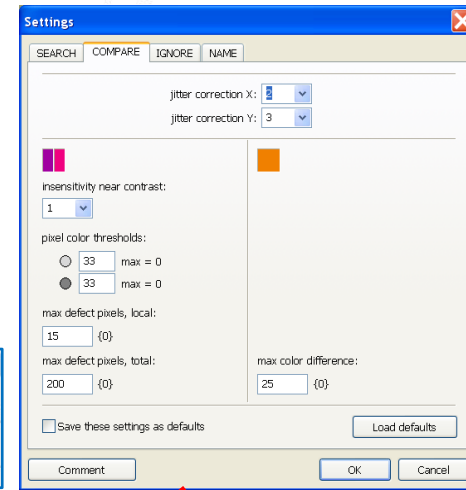
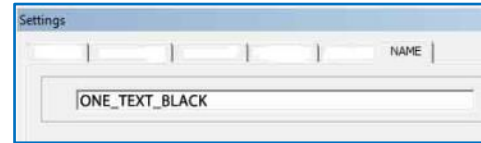


Gaining efficiency.... HOW?



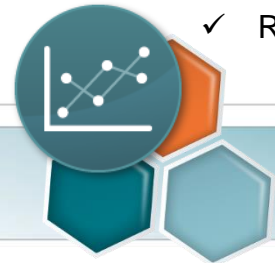
1. DATA GENERATION:

Inspection values from good parts and also defects are generated by *Mühlbauer's SHEET INSPECT System*



2. DATA COLLECTION AND ANALYSIS:

- ✓ Efficient and modular *MB PalaMax.Stats Software Module*
- ✓ Real time big data handling through *MB PalaMax Server System*



Manage your production more efficiently



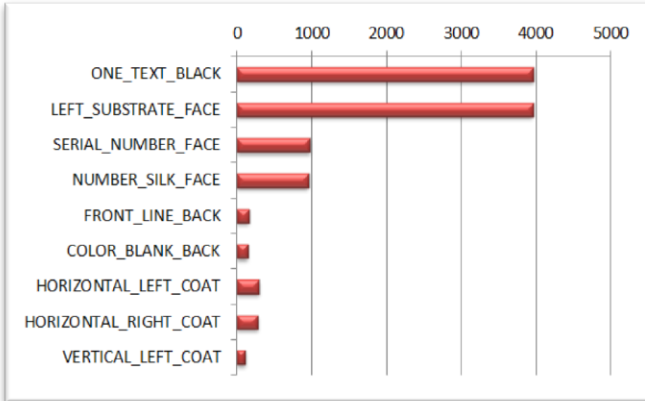
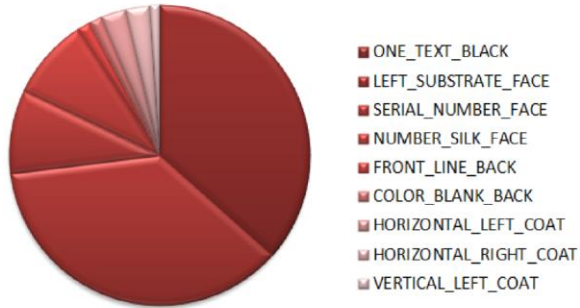
All Defects in Total

Date:	27-Aug-16
Selected Lot Size:	20,000

Overall Statistics

Total Sheets Fed	20,000
Total Sheets Processed	20,000
Total Sheets Rejected	4843
Acceptance Rate	76%
Rejection Rate	24%

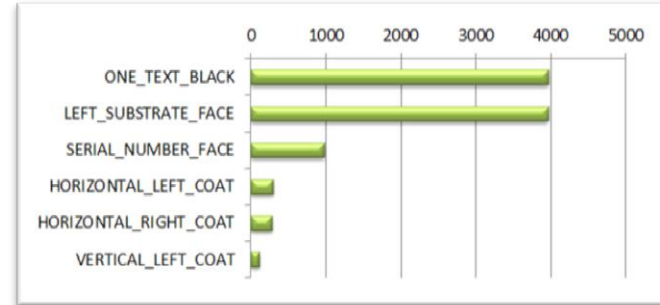
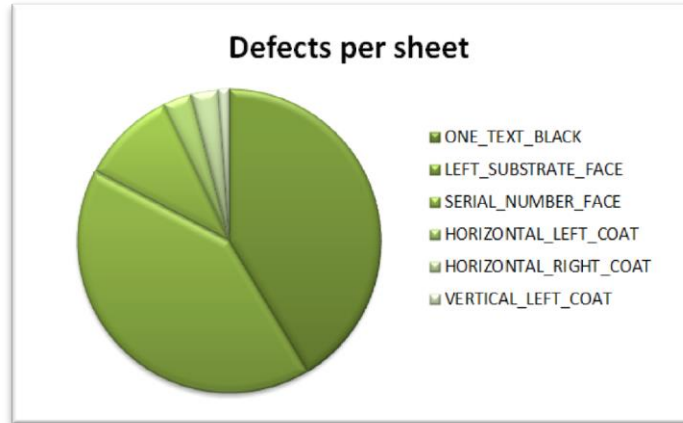
All defects in total





Defects per sheet

Date:	27-Aug-16
Selected Lot Size:	20,000





Frequency distribution of errors per sheet position over selected lot size

170	A1	139	A2	144	A3	143	A4	169	A5
156	B1	150	B2	141	B3	148	B4	151	B5
154	C1	146	C2	153	C3	145	C4	157	C5
36	D1	41	D2	38	D3	42	D4	35	D5
34	E1	31	E2	29	E3	36	E4	41	E5
32	F1	30	F2	33	F3	37	F4	40	F5
31	G1	31	G2	34	G3	36	G4	41	G5
31	H1	27	H2	26	H3	28	H4	43	H5
27	I1	27	I2	28	I3	26	I4	35	I5
27	J1	39	J2	28	J3	28	J4	38	J5

The sheet position analysis shows that the A1 position has 170 errors. Furthermore, all upper sheet positions (A1 – C5) show significantly more errors compared the lower sheet positions.

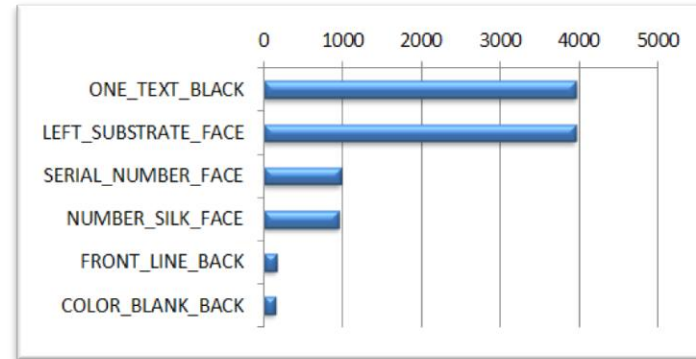
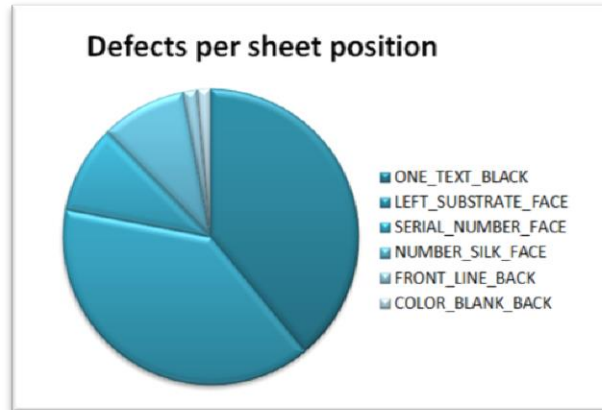
→ Let's have a closer look at sheet position A1!



Date:	27-Aug-16
Selected Lot Size:	20,000
Selected Sheet Position:	A1

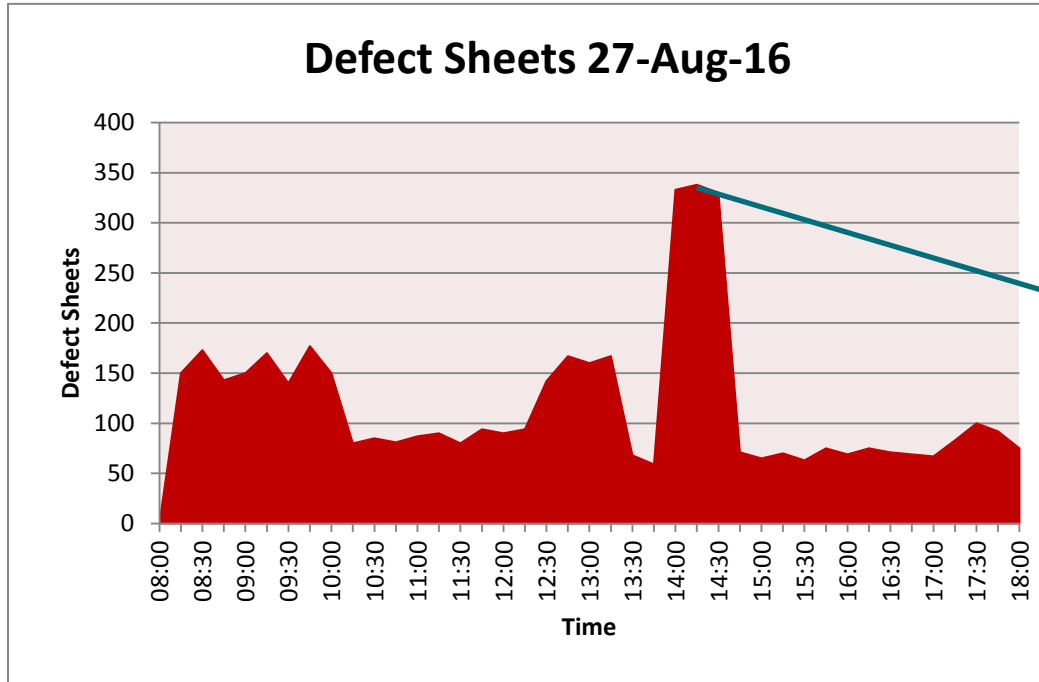


Defects per Sheet Position A1



→ Two defects cause major problems at position A1:
“ONE_TEXT_BLACK” and
“LEFT_SUBSTRATE_FACE”

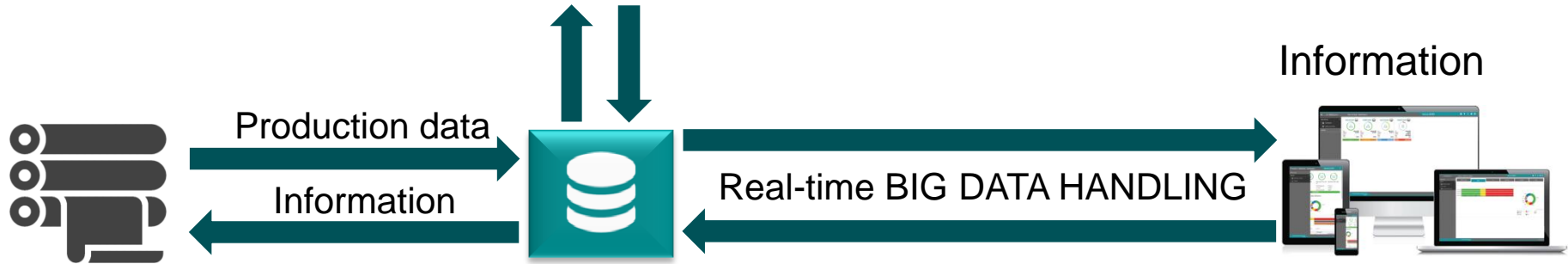




Peak of defect sheets during 14:00 and 15:00 h.



Interface to IT-Infrastructure



- Fast, accurate, 100% inspection
- Objective quality assessment – constant quality standard
- Constant detection performance
- Highest throughput - up to three times higher than other inspection systems on the market
- Most cost efficient system for security inspection due to higher throughput and significantly lower manpower requirement
- Most appropriate method for banknote inspection: no complex handling of final single banknotes required
- Only all-in-one system for the total inspection of all security features: magnetic ink recognition and OVI inspection optionally available
- Permanent protocol of inspection process and defects – evidence document
- Complete process control and efficiency booster through MB PalaMax system



If you can't measure something,
you can't understand it.

If you can't understand it,
you can't control it.

If you can't control it,
you can't improve it.



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