Good Morning

ELECTRONICS & APPLICATIONS
14 T/M 16 MEI 2019 JAARBEURS UTRECHT

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Automatic Material Management for Industry 4.0

Lecture on systems and methods for intelligent SMT / THT components storage and material handling. Starting with an overview on standard storage methods, it is presented how intelligent storage management systems can increase the productivity of the lines, bring real traceability, and monitor humidity effectively, while reducing human mistakes and costs (all essentials points for calculating a realistic ROI). It is also described how Incoming operations can be improved through camera-based systems and unique indicators; a brief vision of present and future possibilities of software integration and how AIVs are the next step towards “Lights-Out” factories

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Production Empowerment

Increase P&P lines production
P&P set up preparation time saving

Time saving

Operators time saving

Space saving

Space saving

No Mistake

Avoid human mistake

RH Control

MSD controlled environment (RH<5%)

MSD Traceability

Complete stock control

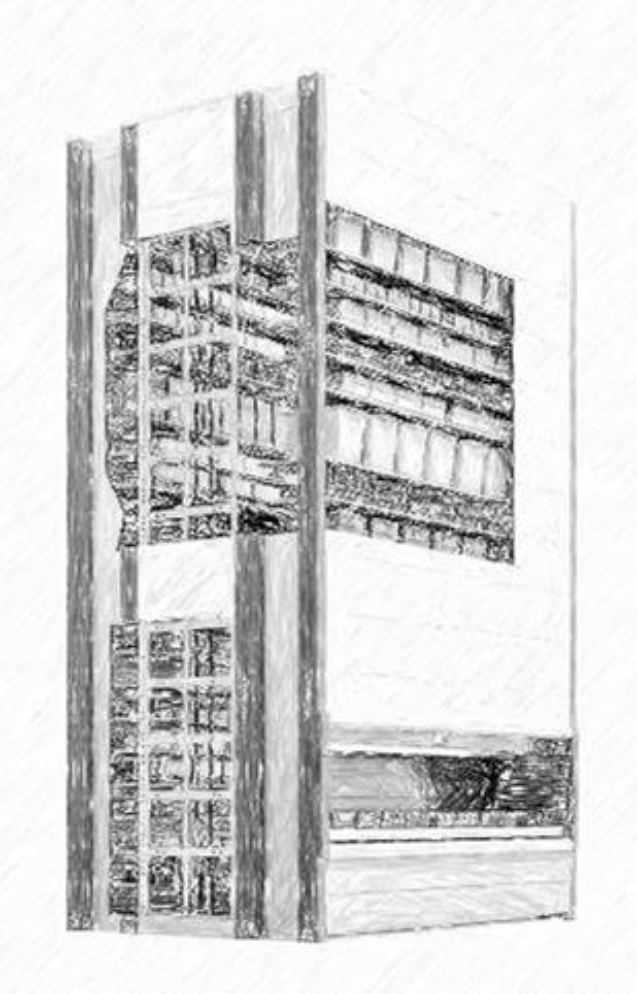
ROI

Money Saving (fast R.O.I.)

Static Vs Dynamic Shelves

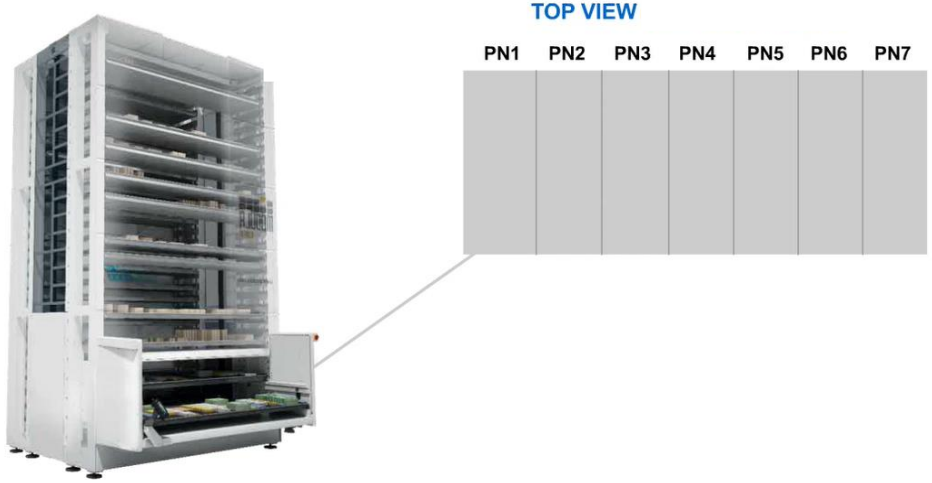
- Static
  - By part number (possible empty spaces)
  - Difficult FIFO
  - Less traceability
- Dynamic external positions
  - Quicker positioning
  - Optimization of the space

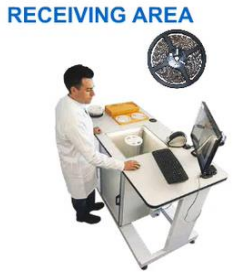
Automated Vertical Solution



- Increase takt time for each reel
- One exit point for several thousands of reels
- The operator has to look for reels inside boxes one-by-one
- FIFO is manual
- Impossible to load and unload components simultaneously
- Impossible to access the material in case of problems of the automatic warehouse

Combination of Vertical system + Buffer Solution





Automatic Extractions

Material Handling Time Estimation

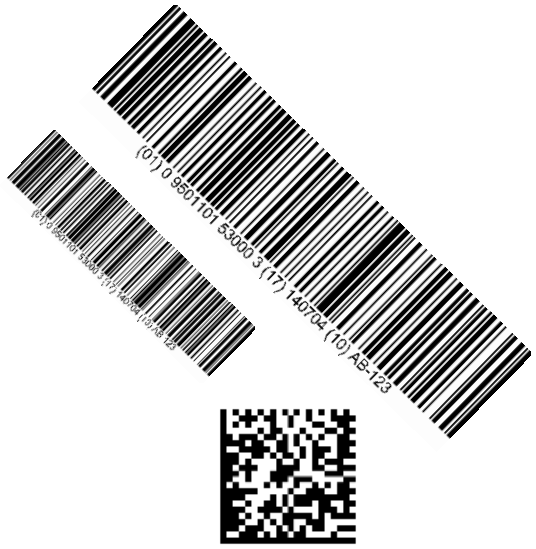
- N° of reels collected a day from the shelves = A
- Average N° of reels returning from the SMT lines = B
- N° of reels moved to and from the Pick and Place lines per day = A+B
- N° of new reels entering in the company in a day = C
- Total reels moved per day = A + B + C
- N° of operators working in the warehouse per shift = D
- N° of hours per shift = E
- N° of shifts per day = F
- Percentage of time dedicated by the operators to material handling = G (Material picking, material repositioning, material storing, reel counting, MSD vacuuming and labeling)

- Total minutes worked per day: D * E * F * 60 * G = H
- Minutes per reel = H / (A + B + C) → The average is 2-5 minutes
- Handling time for X (qty of reels that the machine can extract at once)

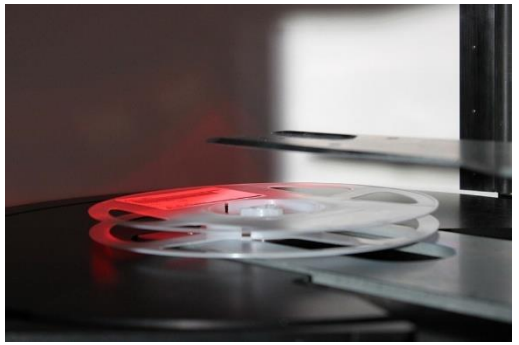
- X * (H / (A + B + C))

SPEED OF EXTRACTION/LOAD OPERATOR TIME

Just load the machine.
A camera should detect any code in any position, with picture traceability



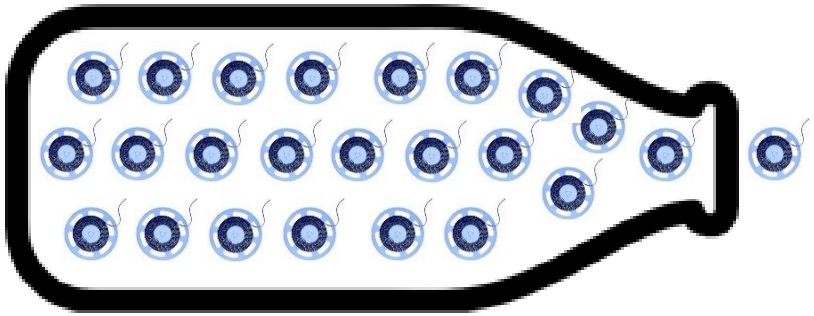
The operator has to position the barcode aligned with the scanner



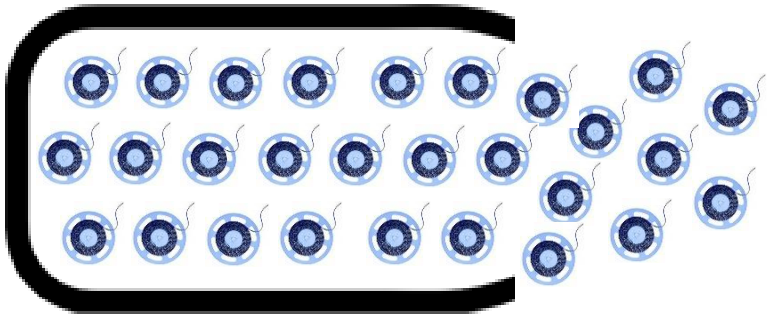
Bottleneck

Definition:

“In production and project management, a bottleneck is one process in a chain of processes, where its limited capacity reduces the capacity of the whole chain.”



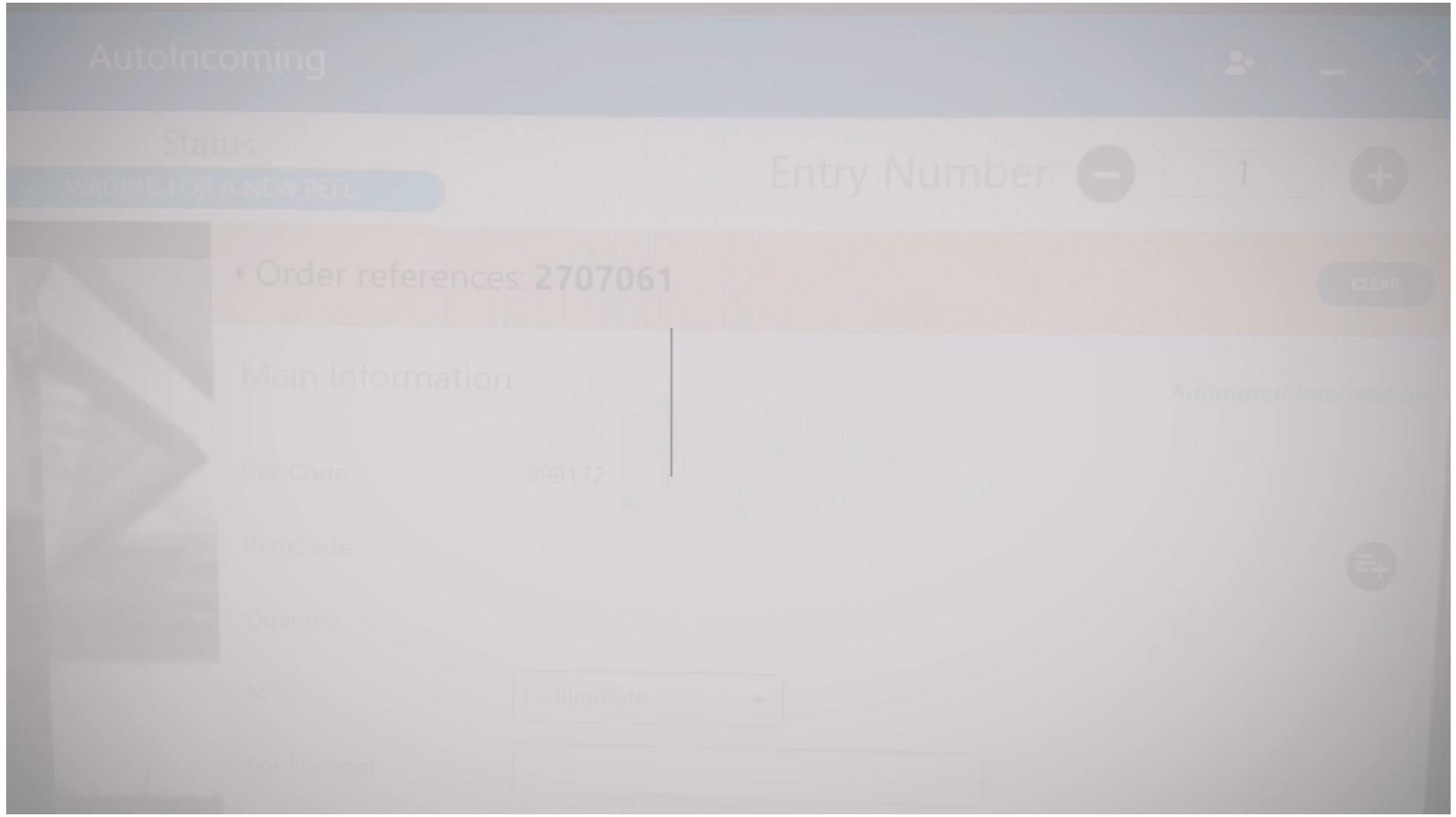
VS



Incoming Material Stations

- Camera reading
- No more data entry;
- The camera and software will create a NEW record for the components by reading the information printed on the labels
  (Qty – Part Number – Supplier – etc.)
- Paste the new label with the Unique ID and load the material in the machine

Incoming Material Stations



Pick to Light solutions

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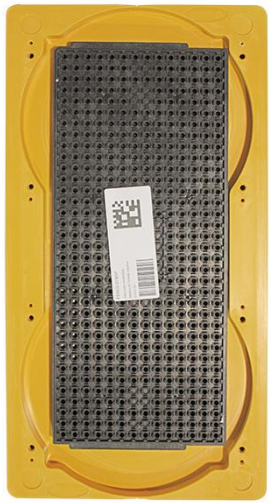
Humidity Monitoring

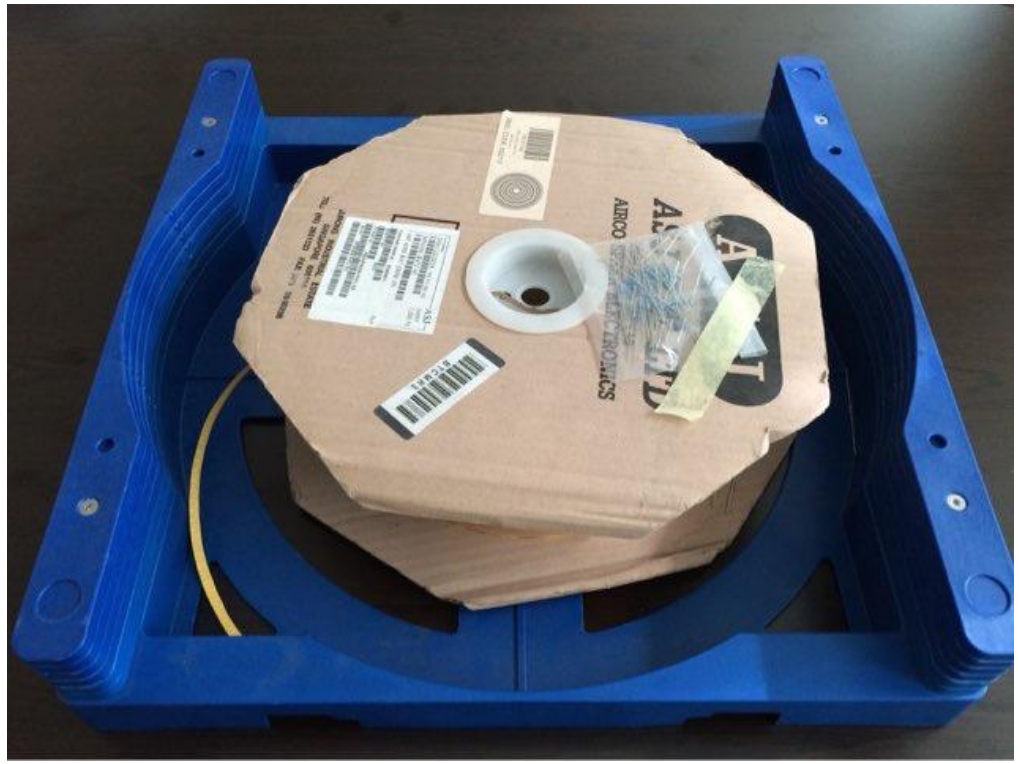
- No more time wasted sealing and vacuuming MSD material

RH Control

Cases Method

- Broken reels
- Paper reels
- JEDECs
- Feeders
- Bags
- Boxes
- Etc





Modularity

- Split & prove the investment
- Fast ROI
- Easy to move
- Configurable
- Multiple exits
- AGV modules
- Xray systems

Software Integration

API – Https based

or

File sharing

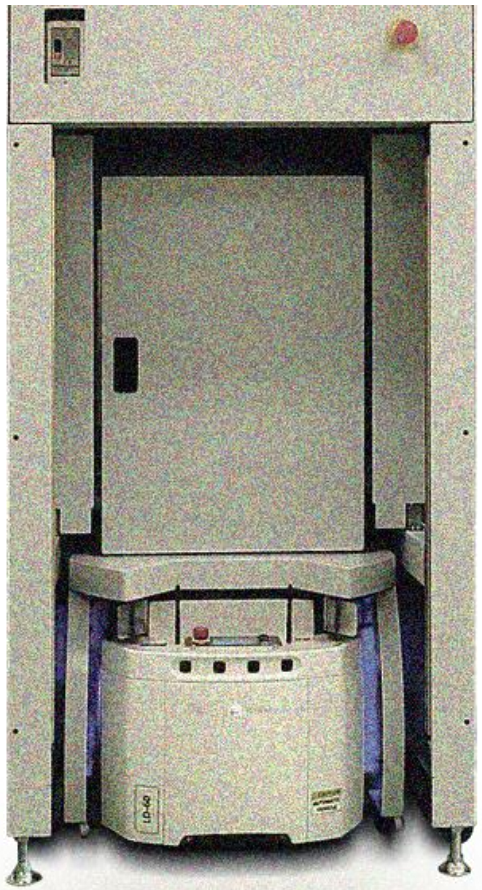
Any

- ERP
- MES
- P&P

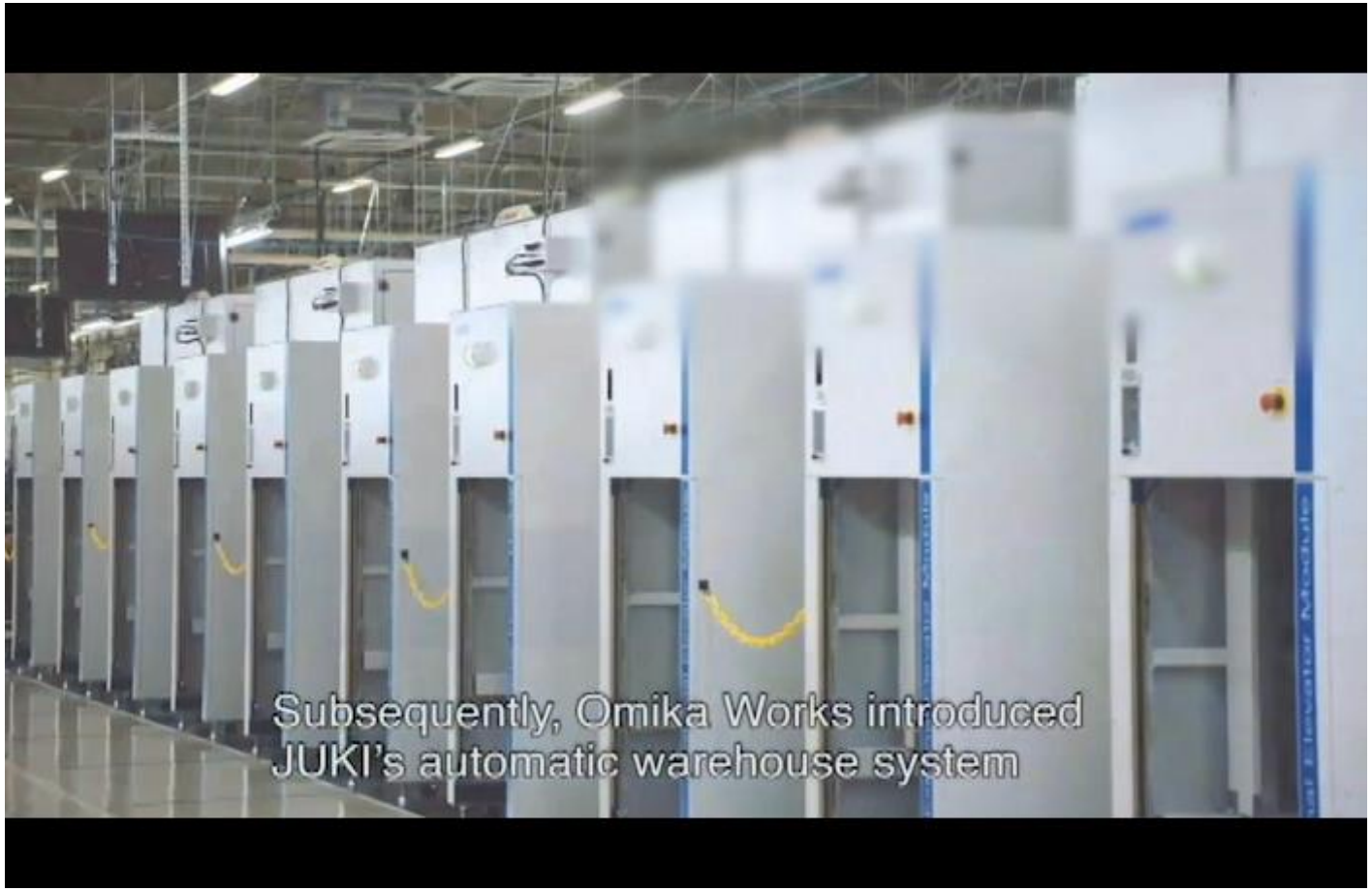
IGV Loading/Unloading

- Example of IGVs Loading/Unloading Points

Industry 4.0 Ready



IGV Loading/Unloading



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Thank you!

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on the booth of

Smans NV

Standnr. 7A054 – Demo square