

Case Study

BREWERY ACHIEVES 22% AVERAGE DOWNTIME REDUCTION ACROSS ALL SHIFTS

Industry: Packaging.

Summary: With the implementation of the Balluff Guided Changeover Solution, a lighthouse brewery reduced downtime, improved OEE and increased output while also improving employee training.

SITUATION

A lighthouse brewery owned by a leading global brewing group needed to increase output on its four packaging machines to better meet commercial demands. Two tray erectors and two cartoners had already been identified as constraints within the packaging can line. They sought ways to improve these specifically, and the overall equipment efficiency (OEE) of the full packaging line, to increase production time and output.

CHALLENGE

Multiple products are processed on the four machines in question, requiring many precise adjustments between production runs. Numerous operators, including some who are new to the company and industry, perform format changes. After an internal analysis, the priority of the brewery's continuous improvement team was to reduce the changeover time of these four machines. They hoped to achieve this by minimizing the need for multiple rounds of fine adjustments during the changeover and ramp-up process, regardless of the operator's experience or skill level, while maintaining the company's high quality output standards (Figure 1). Speeding up the learning curve for new operators with a user guidance system to simplify the changeover process will have additional and long-term positive impacts.

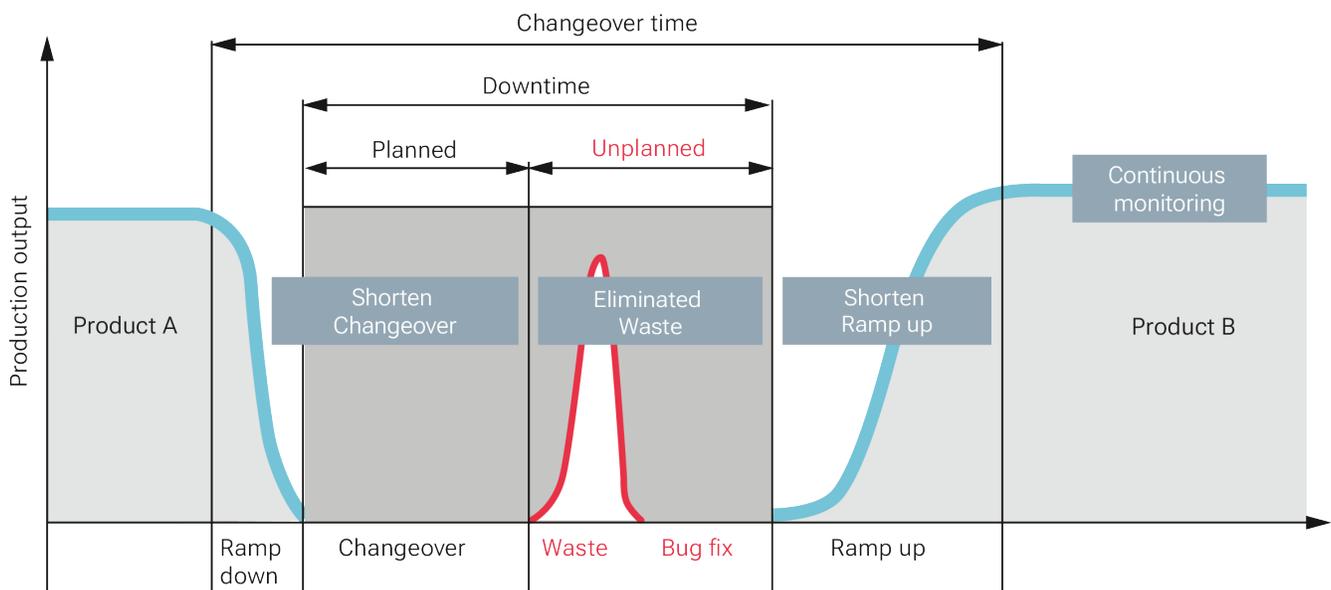


Figure 1

SOLUTION

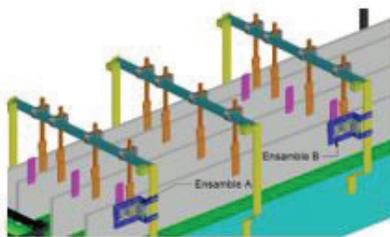
After evaluating several options, the continuous improvement team chose the Balluff Guided Changeover Solution (GCS) because of its simple implementation on the existing machines, intuitive user interface and higher return on investment (ROI).

The GCS—which includes a gateway, software license, network module, and selection of up to 8 sensors—provides step-by-step digitalized work instructions directly in the user interface software, making them clear and accessible to all operators. Detailed descriptions and images can supplement all tasks.

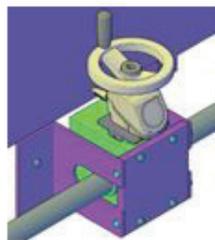
Additionally, each step can be linked to a sensor for which the target value has been defined (for example, adjusting length, width and height settings for guide rails), making it difficult, if not impossible, to start operation without proper setup. Creating the steps is quick and easy. Programming knowledge is not required.

The time-stamped database can be used for further continuous improvement (e.g., SMED analysis).

With full support of the local Balluff team, the brewery’s continuous improvement team was able to realize the full benefit of the GCS retrofit in just three steps: Identifying the critical changeover points or centerline; selecting and installing the appropriate sensors; and creating step-by-step instructions for the operators in the GCS software of the 30 adjustment points of the cartoners and the 31 adjustment points of the tray erectors. (Figure 2, Annex 1)



Accumulation conveyor, entry guides



Conveyor depth, minor fins



Introducing working instructions

Figure 2

OUTCOME

After short training sessions, the operators were able to use the GCS immediately. The GCS software guides them step by step through the format change process. Sensors provide immediate feedback about the change point positions and, thus, facilitate, accelerate and verify the correct settings of lengths, heights and widths.

With these instructions and sensor verification, the required changeover time is now documented and consistent, independent of an individual operator’s experience. Every change point is set correctly, eliminating the need for fine-tuning or tweaking. This not only significantly reduces the time for format changes, but also makes the ramp-up much faster, while avoiding mistakes and reducing waste.

After implementation of the GCS, the continuous improvement team registered a reduction in downtime of up to 28%, regardless of shift or product change (Table 1).

In addition to the reduced downtime, the continuous improvement team has higher field data transparency for further Single Minute Exchange of Die (SMED) analysis and continuous improvement.

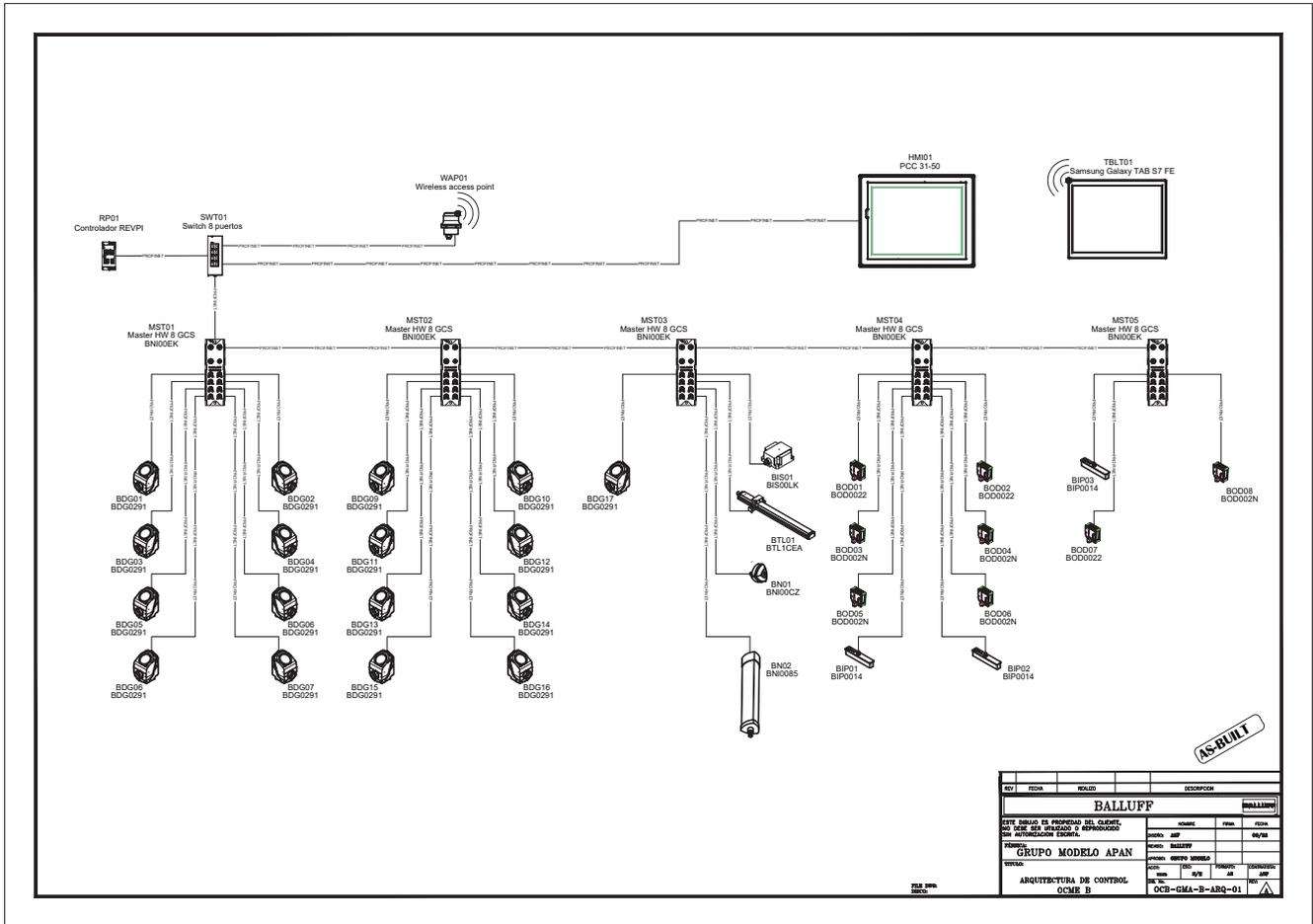
Furthermore, the packaging line managers reported following results:

- Increased manpower flexibility with the user-friendly operator guidance and faster, improved new employee training
- Increased operator awareness about critical change points
- Reduced unplanned machine stops thanks to easy continuous monitoring of the critical centerlines
- Easy storage of XYZ system parameters in the software for traceability

Date	Formato	planned downtime (min)	downtime with GCS (min)	downtime reduction (min)	% downtime reduction
12.04.2024	355 ml Tall can 12 pack refrihelador	130	101	-29	22%
03.04.2024	355 ml estandar refri 12 pack charola	108	97	-11	10%
01.04.2024	355 ml estandar 6 pack Hi-cone	115	93	-22	19%
28.03.2024	355 ml Tall can Hi-con 6 pack Charola	107	84	-23	21%
25.03.2024	355 ml tall Can Hi-con 8 pack Charola	119	93	-26	22%
22.11.2023	Tall can Hi-cone 8 pack	119	86	-33	28%
	Total	579	468	-111	19%

The retrofit’s ROI is estimated at less than 1.4 years.

The global brewing group is now evaluating the roll out of the Balluff Guided Changeover Solution to improve OEE at other packaging lines and locations.



Annex 1: GCS topology and main components



BNI0067
Network block



BIS FAMILY M
RFID system



BTL FAMILY 6-PF
Linear position sensor



BOD00XX
Photoelectric distance sensor



BNI0067
Unmanaged switches



BDG0291
Digital position indicators



BNI SMARTLIGHT
LED stack light



BIP00XX
Inductive position sensor



BAE0117
Power supplies



BSG SOFTWARE
Guided change-over software