CASE STUDY

BRITAX RÖMER

ABOUT BRITAX RÖMER

Britax Römer, one of the leading manufacturers of child car seats and strollers, has played a pioneering role since the 1960s in the development of standards for vehicle safety, and more specifically, the safety of children in vehicles. This includes the invention of ISOFIX (also known as LATCH in the US) in 1997 – a collaborative effort with Volkswagen – and the first international standard for the attachment points for child safety seats in passenger vehicles.

CUSTOMER

Britax Römer

WWW.BRITAX-ROEMER.COM

SYSTEM INTEGRATOR

Welotec

WWW.WELOTEC.COM

LOCATION

Germany

CHALLENGES

- Collect data from existing systems
- Display manufacturing metrics Minimize production downtime

RESULTS

- Utilize existing hardware to eliminate upgrade costs
- Drive higher production output by reducing downtime
- Improve overall profitability

PRODUCTS

INDUSTRIAL AUTOMATION

ProducTVity Stations G3 Kadet

HMI operator panels

DEFINITION OF PROBLEM

As in many companies, the pressure to lower costs led to an investment in new technologies. Because of the rising labor expenses in a high-wage country like Germany, assembly facilities have to identify ways to control costs in other areas. In order to optimize production, it became necessary for Britax Römer Kindersicherheit GmbH to gather data from diverse data sources.

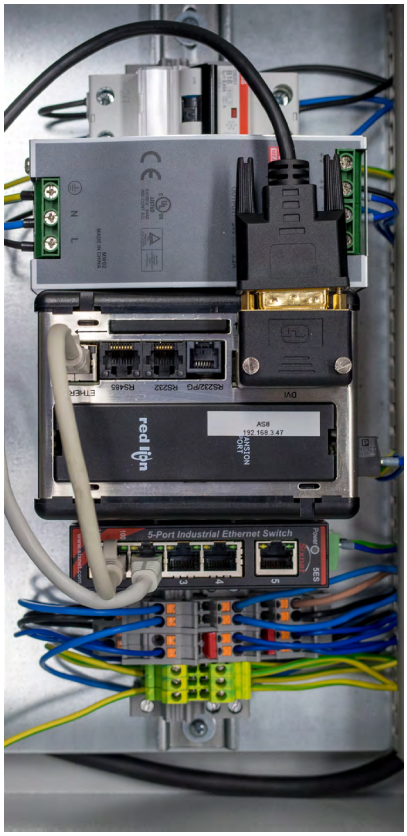
At its Ulm location, Britax Römer searched for a solution to record production data from assembly lines that would then be easy to analyze. This would be implemented in the form of a live view, both on production lines and in departments such as production and maintenance. In time, this would enable employees to ascertain the current production status of their line at-a-glance. In addition, analyses of the data in the form of various charts or graphs would be developed and reported at the end of every shift.

Another goal was to record set-up times and downtime. Typically, productivity can be impacted by small issues that arise repeatedly throughout the day, and the new system would be able to identify how much of an impact these issues were having on the production lines.

START OF PROJECT

At the start of the project, A. Fanelli, Plant Engineering Manager and Project Manager at Britax Römer, chose a pilot line that was equipped with a complete system. It consisted of a 40" industrial monitor to display numbers on the line, a 7-inch input device (HMI) used for interactive communication with the employees, and a line central unit (LCU). The LCU contained the Red Lion ProducTVity Station that communicates with an existing database from which the raw data of the assembly lines are extracted (ERP System), and a small touchscreen input device on the factory floor.

The LCU recognized visual display via DVI/HDMI output. In the case of future expansions and possible use of machines with controls, over 300 different machine languages (e.g. Profibus, Ethernet/IP, S7 TCP/IP) can be connected via the already existing central unit without a license fee being charged. This will also ensure the entire system is flexibly scalable and remains a safe investment going



forward. Britax Römer was right to focus on the future security of the facility at the start of the project, because such a system always needs to be refined and adapted to new production environments and processes. Therefore, it was important to adapt the model updates of the production line independently through one interface. A pending move to new production facilities was another deciding factor for the updates.

STRUCTURE OF **THE SYSTEM**

Figures are displayed and employee input is entered on each line. Input is recorded via the 7" touch input device, the G307K200. The input device (HMI = Human Machine Interface) is connected to the LCU, which contains a ProducTVity Station, among other things. Data is then displayed on each line via an industrial 40 inch monitor.

A production central unit (PCU) is used as the central point for different types of data. The data from the line control terminal, the ERP system, and the line central units are recorded, and figures are determined, on the production central unit. Additionally, this unit becomes the starting point for further analyses of the figures.

Data points can be connected to one another and analyzed via a web server. In addition, maintenance of new product variants, or updated throughput times, is made possible via input on a web server on each computer incorporated into the network. Sensitive areas are, of course, password protected.

PRODUCTION **DATA**

To record production data, the visual display system builds on existing data and hardware and thereby enables a cost-effective solution. Many production variables are extracted directly from a Britax Römer database. Different Key Performance Indicators

(KPIs) for the lines can be developed from this data. For instance, the cycle time or the item quantity could be determined in this way. Since manual assembly is the main activity on the lines, and no machines such as drills are connected, a response is given when a bar code from the production order is scanned. The ERP system transfers this scan, along with other accompanying information, to the production central unit (PCU) via a defined standard interface. The information is recorded by the PCU and used to determine the appropriate KPIs.

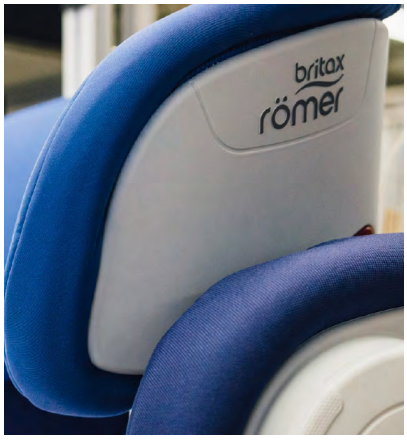
If machines or semi-automatic machines such as screwing units were to be integrated into the process, additional data could be extracted directly from the controls. This is already possible with the installed hardware; thus, everything is equipped for future process changes. Even sensor technology can be connected via different interfaces, and makes it possible to record nearly every condition of a component or production variable. A quality review of components including form, color, correct assembly, etc. is also possible via appropriate sensor technology and has already been successfully implemented for multiple other projects.

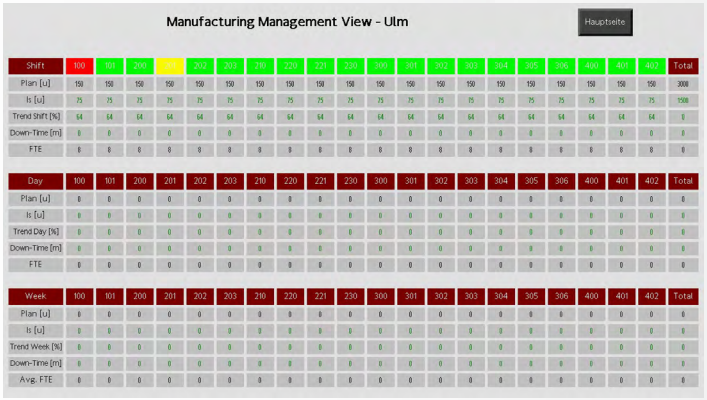
Since the data from the existing system was not sufficient to create the necessary KPIs, and no data was available in the form of machine controls, another solution was needed in order to develop performance indicators such as shift times, downtime, reasons for disruptions, setup times, etc. In this project, input by production employees was chosen as a good variant that was the easiest to implement. Additionally, several entries were needed to calculate KPIs (target specifications) or had to be incorporated from the ERP system.

DOWNTIMES

Disruptions that occur during production are recorded directly by the employees on the production line. The employee can inform the system via the HMI that there is a disruption. If the employee is able to describe the disruption more precisely, based upon categories specified for him, he can type in the information via the keypad into a text box. Basic or detailed reasons for

the disruption can be captured. This creates an extremely detailed analysis of downtime, which enables the company to identify the reasons, consequences, and production losses caused as a result. That information is also made available to the Lean Management team to ensure continuous improvement of processes.





MANAGEMENT **VIEW**

Disruptions are also displayed live in the management view. The status of a given line is displayed by means of a color code so that maintenance can respond right away and production can be restarted as quickly as possible. The system also has the ability to send an alarm via emails. Additionally, current planning is underway to provide phone notifications in the future.

The management view displays on one monitor an overview of all production lines, their figures, and developments over time. No additional software was needed to create the management view; just access to a web browser on the same network. Of course, all of the sensitive areas, and the visual display itself, are password-protected and meet the highest security requirements.

VISUAL **DISPLAY**

Figures are visually displayed on a 40" industrial grade monitor (fanless, 24/7) at the individual assembly lines. Red Lion's ProducTVity Station, which was developed specifically for this application, handles the display controls. The PTV Station is

able to connect almost any machine control and visually display the data on any playback device with a DVI or HDMI interface. Numerous additional functions such as data logging, connection to ERP systems, user-specific scripts, connection of I/O, and web server functionalities have already been implemented. This enables seamless data management from the recording and displaying of figures and integration to the ERP or control systems.

Each monitor displays only the data from that specific line and does so in a way that allows employees to clearly visualize the current production situation and create motivation through appropriate KPI goals. This can be done, for instance, through the use of trend calculations. The trending data provides the exact conditions at the end of a shift and allows the company to estimate production numbers if the system conditions continue the way they have since the start of the shift. Such visual displays are completely customizable. There is no limit to what you can measure or visualize.

PRODUCTS

- PTV00000

  ProducTVity Station visual management system

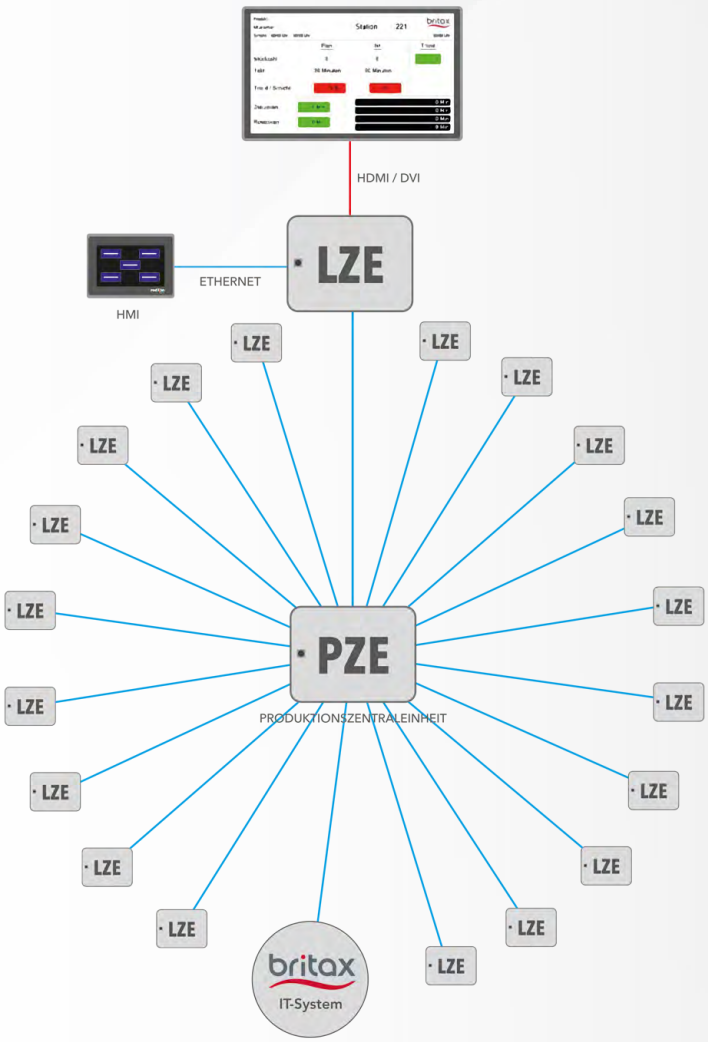
- G307K200

  G3 Kadet 7” Operator Interface Terminal for Indoor Use

SUMMARY

Data collection of production performance numbers is one of the most important foundations for applying LEAN concepts. After system integration, the concepts were successfully implemented, and the first adjustments in the production process were made based on the knowledge that had been gained. This enables massive cost-saving potential and increases competitiveness. Furthermore, the displays on production lines gave the employees access to data that they previously did not have, and they greatly appreciated the benefits that access provides.

NETWORK DIAGRAM



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