

# Management of Quality-Relevant Production Data

Seamless. Secure. Efficient.

For decision-makers in production and quality management

Automotive Industry • Mechanical Engineering • Vehicle Manufacturing • Rail Technology • Medical Technology

## The Challenge: Ensuring Quality, Minimizing Risks

Rising recall costs, stricter product liability regulations, increasing documentation requirements, and a growing shortage of skilled workers – manufacturing companies are facing enormous challenges. At the same time, they must maintain the highest quality standards in joining processes such as screwing, riveting, crimping, bonding, and pressing.

The key question is: **How do you ensure that every single production step is documented, monitored, and traceable in the long term?**

### Do these situations sound familiar?

- During an audit, process data from three years ago is missing – and the database has long since been archived.
- A product recall is imminent, and you cannot precisely narrow down the affected batch.
- New employees make assembly errors because process instructions are missing or outdated.
- Your storage costs for long-term archiving are exploding as databases continue to grow.
- You use tools from different manufacturers and lack a unified data basis for quality assurance.

These challenges are not limited to the automotive industry. Whether in commercial vehicle manufacturing, mechanical engineering, motorhome production, rail technology, or medical technology – wherever safety-critical joining and testing processes take place, companies face the same questions.

### THE SOLUTION

## An End-to-End Software Suite for Your Quality Data Management

CSP, a specialist in QMS software with more than 30 years of experience, has combined four in-house developed software modules for capturing, analyzing, and archiving quality-relevant data into one suite. These modules can be used individually or as an integrated system – as a “digital twin” of your quality-relevant processes.

## Your Benefits at a Glance

**Up to 98%**

lower archiving costs (CHRONOS vs. traditional database expansion)

**30+ years**

of audit-proof data availability for product liability & audits

**Billions**

of data points analyzed and processed daily

**Zero-error strategy**

supported by worker guidance and real-time alerts

## The CSP Value Proposition

-  **No dependency on a single tool manufacturer**  
All modules process data from different equipment manufacturers. You only need one solution at the shop floor level – regardless of which screwdrivers, presses, or testing equipment you use.
-  **Productive in weeks instead of months**  
Standard software with limited customization requirements. Modules can be implemented, configured – and used immediately.
-  **Fits into your existing IT landscape**  
Extensive connectivity with ERP, MES, PLM, and CAD systems via OPC UA, MQTT, and XML. No need to replace existing infrastructure.
-  **Scalable from a single workstation to a global enterprise**  
Whether 50 tightening operations per day in mechanical engineering or billions of data records per plant in the automotive industry – the software grows with your requirements.
-  **Long-term cost control**  
Reduce storage costs, licensing costs, and rework rates. Financial and administrative effort for implementation and operation remains manageable.



## Overview of the Four Modules



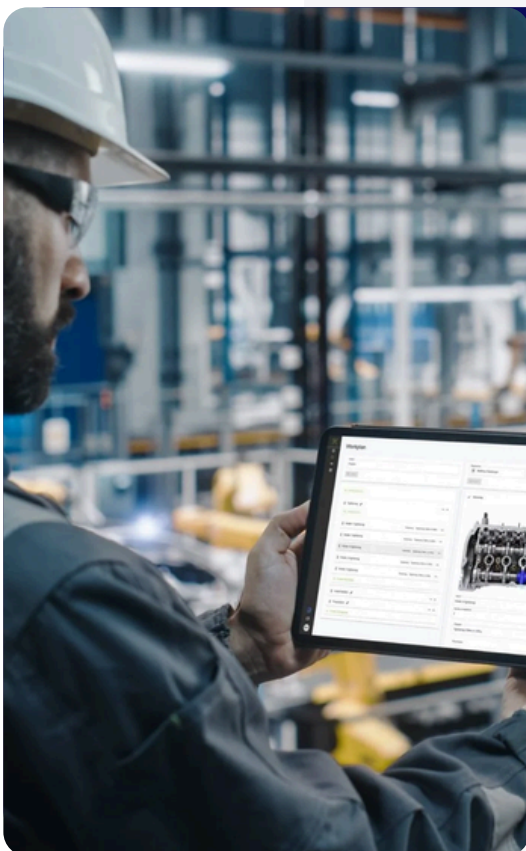
### MODULE 1 | IPM

## Integrated Process Data Management

**Your problem:** You have thousands of joining processes per day, but no unified view of quality data. Deviations are detected too late, reports are time-consuming, and the product lifecycle record exists only in fragments.

**Our solution:** IPM captures all data from the production process – torque values, press-in values, test results – and automatically documents them in a product lifecycle record. The MES-related software detects deviations immediately and sends real-time alerts, e.g., via email.

**The result:** You always know that all process steps were within specified tolerances – and can prove it. IPM already supports processes such as screwing, riveting, welding, bonding, filling, forming, and testing.



### MODULE 2 | PG

## Production Guide (Worker Guidance)

**Your problem:** Even when technology and processes are correct, the human factor remains: new employees, changing workflows, or routine errors lead to quality-relevant mistakes. In times of skilled labor shortages, this risk is increasing.

**Our solution:** PG is a visual assembly assistance system, comparable to a navigation system. It guides workers step by step through the entire process chain using screen-based visualization with text and images. Where possible, process steps are automated – for example, through integration with ERP or MES.

**The result:** A controlled and monitored process in line with a zero-error strategy. PG can even function as a mini-MES and take over tool control. All generated data is documented long-term in a database.



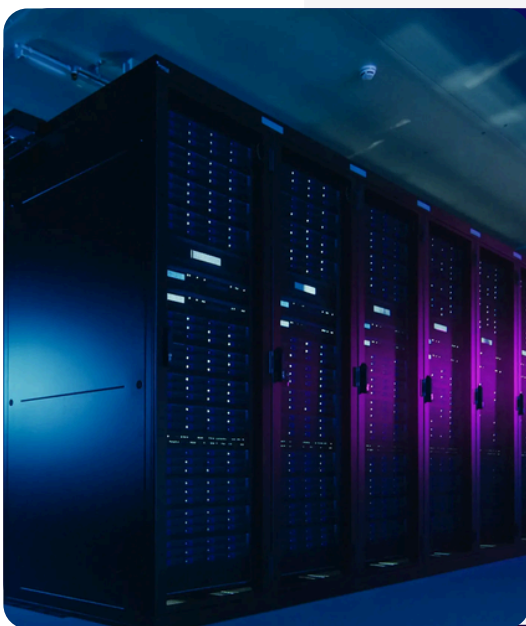
#### MODULE 3 | QST

### Torque Data Acquisition and Quality Inspection

**Your problem:** You must regularly verify the capability of your tightening tools and testing equipment – throughout the entire product lifecycle. Safety-critical fastenings (Class A and B) require special care.

**Our solution:** QST enables planning, execution, and evaluation of quality inspections in series production – with a focus on tightening processes. The tool supports process and machine capability tests as well as random sampling inspections using test keys.

**The result:** High accuracy even with many thousands of tightening processes per day. In combination with CHRONOS, all data – for measurement points, individual products, tools, and test devices – remains accessible even years later.



#### MODULE 4 | CHRONOS

### Long-Term Archiving

**Your problem:** Large volumes of data must be archived and remain accessible for many years. The result: databases become slower, storage costs increase, and you must invest in increasingly powerful hardware.

**Our solution:** CHRONOS identifies inactive data, converts it into an open, long-term secure format, and transfers it to a separate storage system. Production databases become smaller and more efficient. Even without an active database, users can search via CHRONOS as if it were a database.

#### PRACTICAL EXAMPLE

**One customer faced the choice – \$1.2 million/year for traditional database expansion or approx. \$20,000 for CHRONOS storage. The decision was clear.**

## Proven in Practice – Selected References

CSP software solutions are used by leading companies across various industries:

### **BMW Group** | Automotive

Uses IPM, QST, and CHRONOS worldwide for long-term archiving. CHRONOS archives more than 130 million data records per plant per month from various Oracle databases – audit-proof for 30 years. Result: significantly reduced licensing and storage costs.

### **Mercedes-Benz, Hamburg** | Automotive

Production of axles and steering columns – highly stressed safety components. In use since 2006. IPM provides the base data for quality planning and assurance for thousands of tightening operations daily.

### **MAN Truck & Bus, Munich** | Commercial Manufacturing

More than 30,000 screws per day in axle production. 80 tightening systems connected to the IPM network. Precise tightening cycle recording and condition-based maintenance after approx. 100,000 cycles.

### **Knorr Brake** | Railway

The market leader for braking systems uses the PG worker assistance system to ensure that all parameters (torque, angle, tightening parameters) are maintained and the correct tools are used.

### **Stadler Rail, Winterthur** | Railway

Tightening processes in bogie assembly are secured with PG. 13 test keys from different manufacturers with WLAN connectivity. Results visible on tablets at the workstation with real-time deviation alerts.

## Cross-Industry Application

Originally developed for the automotive industry, CSP software is used wherever maximum quality and complete documentation are required:

<b>Automotive</b>	Body construction, axle assembly, steering production – thousands of safety-critical tightening operations per shift, product liability over decades.
<b>Commercial Vehicles</b>	Axle production, chassis assembly – highest requirements for torque reliability in heavy-duty components.
<b>Vehicle &amp; Motorhome Manufacturing</b>	Bonding processes, leak tests, furniture assembly – quality assurance across various joining techniques.
<b>Mechanical Engineering</b>	Assembly of modules, hydraulic fastenings, press connections – condition-based maintenance and process capability verification.
<b>Railway</b>	Safety-critical tightening in bogies and braking systems – full traceability required.
<b>Aerospace</b>	Documentation of every assembly step – highest demands for traceability and audit capability.
<b>Medical Technology</b>	Regulated production with strict compliance requirements – every process step must be verifiable.

## Conclusion: The Digital Twin of Your Quality-Relevant Processes

With the CSP software suite, you map your quality-relevant production processes end-to-end – creating a “digital twin” that serves as proof throughout the entire product lifecycle. From capturing every individual joining process to real-time analysis and alerting, all the way to long-term archiving: the CSP suite provides transparency, control, and legal certainty.

For you, this means: less rework, lower recall costs, faster audit responses, and a solid foundation for your zero-error strategy – regardless of which tool manufacturers or IT systems you already use.

## Contact us

Let's work together to find out how the CSP suite can optimize your quality processes.

1

### Free initial consultation

30 minutes to discuss your specific use case

2

### Live-Demo

See the software in action – with data from your industry

3

### Quick-Assessment

We analyze your current process landscape and identify optimization potential

CONTACT US DIRECTLY

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## CSP at a Glance

Since 1991, a pioneer for innovative software solutions in the manufacturing industry. Headquarters in Großköllnbach near Dingolfing, with offices in Hanover, Regensburg, and Chattanooga (USA). Around 100 experts. Customers include BMW, Volkswagen, Mercedes-Benz, Stadler Rail, Knorr-Bremse, and many more.

**Do you have any questions?**  
Feel free to get in touch with us!  
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