



Bluetooth™



**SCHILDKNECHT**  
SMART DATA COMMUNICATION

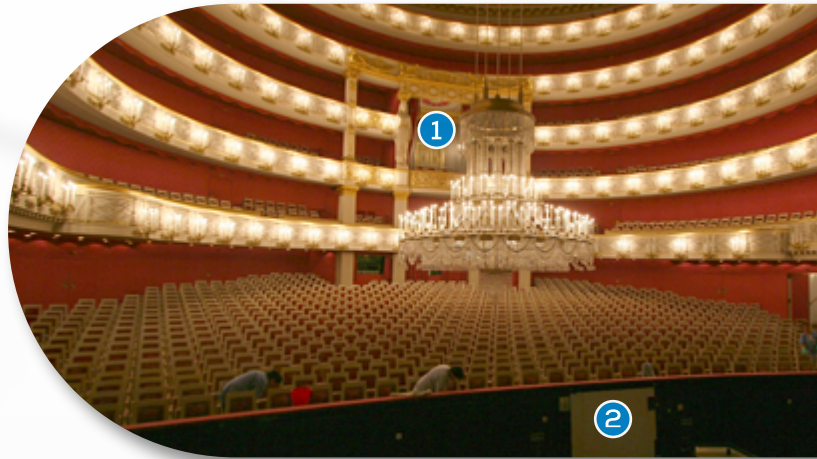


# STAGE TECHNOLOGY RELIES ON DATAEAGLE

Data radio systems for highest safety requirements

## WIRELESS SYSTEMS IN STAGE APPLICATIONS

DATAEAGLE® radio data systems have been applied within stage applications for many years. The Bavarian Opera house automates moving stage segments with DATAEAGLE wireless data transmission systems.

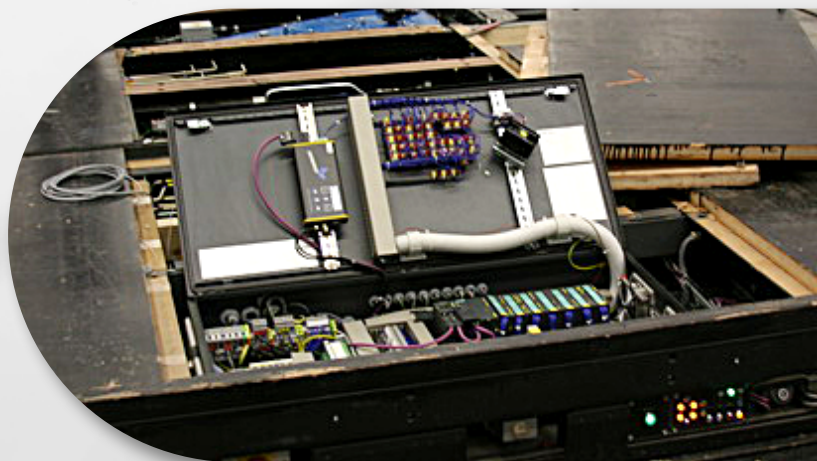


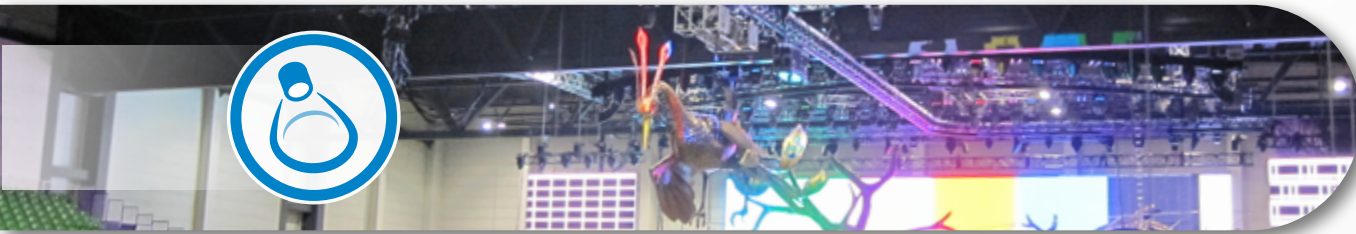
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All technical components are monitored and controlled from backstage. That is where the central control unit including the DATAEAGLE radio master is located usually.

2

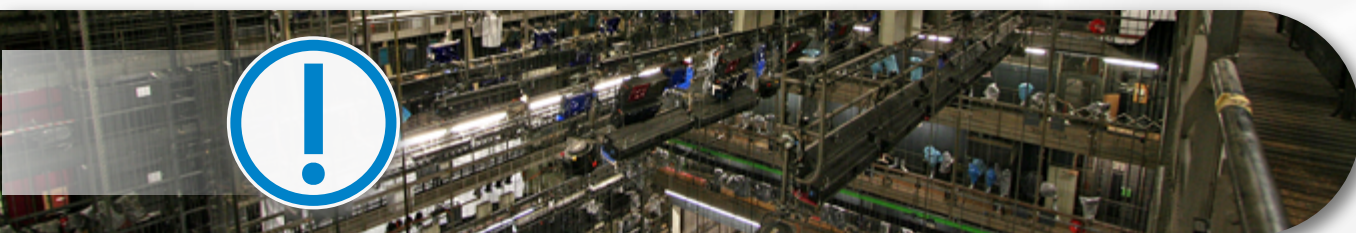
The DATAEAGLE radio slaves are located decentrally at the moving parts like here inside the stage elements.





## APPLICATION

Visitors of musicals and show events but also of theatre and opera performances have high expectations with regard to vivid stage action, frequently also enriched with a little bit of "thrill". Attractive effects of sound, lighting and above all motion optimally coordinated with each other are the prerequisite for positive visitor acceptance. A well-known example for this is the Helene Fischer Show Farbenspiel with the "flight of the bird" above the audience. Essential for the success of such events is stage technology acting in secrecy, rightfully considered to be a particularly sophisticated segment of automation technology. Control units, converters, drives, sensor systems, interfaces, communication technologies and radio technology, all these typical automation elements taking effect behind, above and under the stage. Planned and implemented by special companies of plant engineering and construction – such as for instance [Füllung+Partner Ingenieurgesellschaft GmbH](#) – as well as tested and approved according to international safety standards, stage technology is the prerequisite for economic success of an entire industry! And for many years, the radio module [DATAEAGLE®](#) of [Schildknecht AG](#) has also been part of this "elite" of automation components, providing for safe, wireless controlled motion sequences on stage and even in the audience area.



## CHALLENGE

The particular challenge to any stage technology is the combination of highest security for all persons on stage and where applicable in the audience area while guaranteeing an exact and trouble-free course of motion effects according to direction requirements. For this purpose, system components are subject to time-critical motion without trailing cables between e.g. control unit and drives becoming visible for the audience or even hindering actors on stage. This challenge is even enhanced as soon as performance is moved to another venue and therewith other, maybe narrower location. Therefore, the entire stage technology including transmission paths for power supply and control signals must be capable of flexible configuration without trailing cable connection and of complying with the requirements to functional security (Safety Integrity Level, SIL) at any time. For radio technology applied as cable substitute consisting of transmitter, antenna and receiver this represents a considerable challenge: it must – regardless of the respective spatial conditions – guarantee highest operational safety and availability.



## SOLUTION

Successful solutions have been provided for years by fieldbus (PROFIBUS and PROFINET)-based automation systems consisting of safety controls as radio master and power electronics, drives, radio modules and other components as radio slaves. While motion sequences allow e.g. power electronics driving along at a bar, wireless fieldbus signal transmission is done from the stationary control system to moved components by radio modules of the **DATAEAGLE 3000** series (Wireless PROFIBUS) and **DATAEAGLE 4000** (Wireless PROFINET). Occasionally, the entire control system is executed also on two channels for even enhanced functional safety. DATAEAGLE radio modules apply the 2.4 GHz Bluetooth technology, which in view of their robustness and the feature of **frequency hopping** has almost replaced the previously usual WLAN technology. A substantial added value with regard to operational reliability is provided by **DATAEAGLE®** thanks to its **patented data pre-processing**, filtering out potential, short-term transmission failure reliably and thereby guaranteeing for particularly robust radio connection.



## RESULT

Stage technology is in factual context with control of motion sequences, typically applied in the spatially limited environment and is required to comply with particularly strict safety requirements. Trailing cables for transmitting control signals formerly applied but interference-prone are nowadays replaced with wireless radio links, with a high availability being an important criterion when selecting radio technology. In this regard, devices of the **DATAEAGLE®** series of **Schildknecht AG** have proved excellently and therefore have become part of the standard equipment of innumerable stage technology systems. Even if from the value point of view these devices are of minor importance for the entire system, they are decisive components with regard to system availability. Project Manager W. Rolla of the stage technology plant engineering company Füllung + Partner Ingenieurgesellschaft GmbH summarizes his longstanding experience with radio technology as follows:

*"In our stage technology systems, we have replaced trailing cables with radio links at an early stage already and thereby gained practical experience with different radio systems over the time. Based on this experience we have been regularly applying devices of the DATAEAGLE series for some years in our devices, preferably the DATAEAGLE 3712 which is aimed at PROFIBUS and PROFIsafe transmission. In numerous projects, this radio module with its filter technology against signal interferences has proved extremely reliable and powerful."*

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