

### Monitor event equipment with load shackles

Parts of the event equipment (such as lighting, loudspeakers, etc.) are suspended from the ceiling construction using electric chain hoists and can thus be easily adjusted in height and positioned. In order to record the load with which each individual chain hoist loads the ceiling, load shackles are often mounted between the attachment points in the ceiling and the hoists. If you evaluate the entirety of



### A look into the future

We are currently developing a system in which several hundred sensors can be connected via a fieldbus and the load values of the individual sensors can be visualized using a web browser. This solution allows the user remote access to the data and thus to the (load) events on site. The costs for installing such a sensor network on a hall ceiling are significantly lower than for conventional sensors. Since the digital sensors can be connected directly to each other (in a line), the time required for wiring is drastically reduced. All Primosensor force sensors can be integrated into the system.



all attachment points in a ceiling construction in this way, you get a picture of the total load on the ceiling.

More information:



## Products for stage technology

## Products for rigging applications

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In stage and event technology, increased demands are placed on the safety of people and systems. Since large loads are moved here in a very small space, there is always a risk that the system or its operator will be damaged or injured through carelessness.

### Standards and accident prevention regulations

Numerous standards and regulations must be observed. These include the accident prevention regulations DGUV regulations 17 and 18 (formerly BGV C1) for event and production facilities for scenic representation, EN 17206, which deals with safety requirements and testing of machines for stages and other production areas, and last but not least, IEC 61508, which deals with the functional safety of electrical, electronic and programmable electronic systems.

### Security before dividends

Primosensor safety electronics are, for example, equipped with an integrated test function. Activated by the platform control, it can be checked whether the sensor is working properly. As a rule, the test is carried out every time the stage system is started – at least once every 24 hours. In conjunction with a safety controller, these sensors achieve safety integrity level 3 (SIL CL3) according to IEC 61508.

### Capture multiple loads together.

It often makes sense to record and evaluate several loads together. For example, on an elevated platform with multiple lifts, the total load is of interest. In addition, one would like to recognize the overload of a single lifting unit and then interrupt the lifting process. Primosensor's S-Box fulfills this task. Up to 8 analog signals are summed, each one checked for exceedance of limit value and cable break. The S-Box is suitable and certified for the use of force transducers with a test signal.



Our certifications are currently being renewed. The applications are extended to 2-channel sensors.

### Theater, opera house, event halls

With permanently installed stage technology in theaters and event halls, the force sensors from Primosensor are used in both the upper and lower machinery to record loads and prevent the systems from being operated with excessive loads.



The sensors measure either directly in the power flow or indirectly as a torque support of drives or winches. They are a central element of the safety equipment.

### Our products for stage technology

In addition to numerous standard geometries of force sensors, such as tension force sensors (ZDA, SY, MSY series), shear beams (SST series), load pins (MA series) and load cells (MDP series), Primosensor also offers customized sensor variants. This includes modified sensor geometries as well as special requests for the output signal

or requirements for limit and fracture load.

### Developments and custom-made products

Again and again, special solutions are developed with and for our customers. For example, a compression force sensor was designed for the rigid chains from SE-RAPID, which can be mounted



directly on the rigid chains with little effort. The sensors are extremely robust. They can absorb bending moments and are not sensitive to lateral

forces, so that they can be mounted under a platform for load measurement without additional installation elements such as suspension arms.

### Test device Check-It-1

We have launched the Check-It 1 for easy testing of sensors with a test function. It makes it easier for the service staff to check the function of Primosensor sensors during commissioning and maintenance of the system - even when installed. The battery-powered device is connected to the sensor. It directly displays the



current output signal in mA or Volt. The test function can also be activated and thus checked.



### Safety for „temporary structures“

In addition to the fixed structures, the event technology also includes the so-called „temporary structures“. These mobile structures are repeatedly erected and dismantled at various locations for a limited period of time. They are typically used at festivals and open-air events.

High safety requirements also apply to these buildings. The personnel that builds such structures must be educated and well trained. The riggers (rigger = rigging) usually erect such structures from stable truss systems, which are additionally anchored with



ropes so that they can withstand wind and rain. In order not to damage such a construction by introducing loads into the ceiling construction or even causing it to collapse, the load is monitored there at relevant nodes. The same applies to the ceilings of exhibition halls.