

Professional article

Signal conditioning – purely analogue: the modules of the TSA series

In today's world, mobility is an essential part of our lives. When the car has to be to the workshop for repairs, it is an irritating limitation in day-to-day life for many drivers. In order to make cars more durable and meet the quality requirements of customers, automotive manufacturers subject their vehicles to endurance testing. The devices of the TSA series from the Imtron Center of Competence of the GHM GROUP offer independent technology with long-term durability for smooth signal conditioning of nearly any analogue sensor signal.

Requirements

When testing the opening mechanism of vehicle doors, the endurance test must be designed to be as close to reality as possible. In this connection, not only is it important that the mechanism of the doors is tested for permanent durability, various environmental conditions, such as temperature and air humidity, must also be integrated. For this purpose, the obtained sensor signals must be converted into usable data without interfering signals.

Tried and tested approach

The sensor signals are prepared, filtered and galvanically isolated with the signal conditioning modules of the TSA series. Interfering signals are suppressed and thus the signal quality is improved significantly with the interchangeable filter modules. Moreover, in addition to the preparation of signals, the TSA modules are simultaneously responsible for the feed to the sensor and the galvanic isolation between input and output signal and the voltage supply. The electronic components of the modules are protected from condensation in changing climatic conditions with a special coating on the printed circuit board. Therefore, the TSA modules are ideally suited for use for the testing of the permanent durability of vehicles and remain cost-effective, because they combine signal conditioning and galvanically isolating amplifiers in a single device.

Basic configuration – example

The modules are designed for potential-free signal conversion and conditioning in automation and measuring technology. Each of the modules has 3-way isolation and offers flexible interference suppression with plug-in filters. Various frequencies between 1 Hz and 30 kHz and various filter characteristics are available. The filters can be designed as low-pass (standard), high-pass, band-pass or band-elimination. They are designed as Butterworth or Bessel filters of the 4th order. Other orders and filter characteristics can be implemented on request.

With potential isolation and filter characteristics, the modules are especially well-suited for suppression of interfering influences in measuring and control circuits, for galvanic isolation of power and signal circuits, as well as for prevention of earth loops.

With a ripple of < 2 mVpp and a precision of 0.1%, the modules are also suited extremely well for technical measurement applications.

The standard supply voltage is 24 V DC. An optional 12 V version is also available. The modules have plug-in connections for simple connection. The standard module width is 22.5 mm.

Customer-specific adaptations in every respect (e.g. measuring ranges, amplification factors, sensor feed) can be realised.

Benefits

- **Cost reduction:** Signal conditioning and galvanically isolating amplifier in one device, a separator isolator is unnecessary
- **More signals:** Optional second output for integration into displays, PLC, or data acquisition
- **High signal quality:** Flexible interference suppression with replaceable filter modules
- **Speed:** Limit frequencies of up to 30 kHz possible
- **Precision:** High precision and long-term stability
- **From a single source:** Modules available for most analogue sensor signals
- **Special requests:** Tailored solutions possible, even in small quantities
- **Service-friendly:** Plug-in connection terminals ensure easy installation
- **User-friendly:** No software necessary – plug & play

Summary

Thanks to their high signal quality even under changing conditions, the TSA modules are a profitable solution for automotive manufacturers that can be individually adapted to customer-specific requirements, even in small batches. Use of the GHM technology means a cost-effective and reliable implementation for an outstanding price/performance ratio.

GHM Messtechnik GmbH is a pioneering specialist and complete provider for innovative measuring and regulation technology. With more than 330 employees in sixteen locations worldwide, the company develops and produces a wide assortment of more than 2 000 high-quality device types.

The versatile portfolio comprises industrial electronics, industrial sensors, environmental measuring technology, water analysis, process measuring technology (hygienic design), state-of-the-art laboratory and handheld measuring devices and measurement data recording.

From the fusion of the Greisinger, Honsberg, Martens, Imtron, Delta OHM and VAL.CO companies, the GHM GROUP still considers itself a tradition-oriented company. With an eye on the vision of the founders, the company continues in its consistent efforts to permanently advance measuring and regulation technology with innovative developments and application-specific solutions.

The central focus is the bundling of technological expertise for development of customer-oriented solutions that are appropriate for the market and tailored to the high demands of industry and producing industry. In addition to long-term expertise and state-of-the-art production methods, the GHM GROUP offers competent application consultation and comprehensive customer service, high flexibility even for small part quantities, quick device adaptations and short delivery times. This is all offered at an outstanding price-performance ratio.

Publication free of charge.

Please send a specimen copy to the address below.

Further enquiries | Contact:

Viola Weyrauch
Marketing Communications

GHM Messtechnik GmbH | **GHM GROUP CORPORATE**
Headquarter | Schloßstr. 6 | 88453 Erolzheim | GERMANY
Tel. +49 7354 937233-604 | Email v.weyrauch@ghm-messtechnik.de
www.ghm-group.de