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the new IMX12 genera-  
tion on the market

# Pentathlete

**Turck's new IMX interface device platform provides a five-fold innovation leap in the following disciplines: compactness, speed, accuracy, safety and globality**

A look at the development of interface technology will show that manufacturers and customers increasingly have three key requirements: Safety, particularly with regard to Ex separation and functional safety (SIL), the space requirement on the DIN rail, and performance – particularly with regard to the speed and accuracy of the devices. Although existing interface devices can meet these requirements to a certain extent, the possibility of their further development is normally limited.

For many years, Turck has offered a wide range of interface devices on the market which have also been continually adapted to the latest developments. However, it is only with a completely new electronic platform that a manufacturer can offer future-proof innovations based on state-of-the-art technology, which can provide customers with investment security for the next decade. Turck has therefore invested a

great deal of time and money in the development of a completely new generation of interface technology. Having rigorously tested the IMX series and having acquired an extensive range of approvals for it, the Mülheim-based automation specialist has now launched the first devices of the new IMX interface platform. This not only sets new standards in terms of the traditional issues of safety, space and performance already mentioned, but also opens up new markets, such as in mobile equipment, thanks to its 10...30 VDC capability.

## **Functional safety and Ex separation**

The issue of functional safety has grown in importance in recent years. In the beginning, safety integrity levels (SIL) had been equated with quality. However, plant operators have gradually developed a greater understanding of safety in their applications. Manufacturers



have consequently had to meet these resulting challenges. Turck directed its development process for the new IMX series completely in compliance with the requirements of IEC 61508, and recognized independent bodies have certified this process. The comprehensive manuals and commissioning guides support customers in the operation of the devices in functional safety circuits.

#### Global approval portfolio

Ex approvals can also present a challenge, particularly when the same device is required for use in different countries. Unfortunately, Ex approval is not as uniformly harmonized worldwide as in Europe, where the ATEX directive is applicable in all countries. Different continents mean different standards. The challenge of all device manufacturers is to cover the different requirements of all relevant Ex approvals combined – prefer-

## QUICK READ

Proven technology has advantages and disadvantages: Although it may be well-established and fully mature, at some point it cannot be developed any further. If additional performance is required, the only solution is a consistent innovation using the latest technology and providing customers with security for the next decade. Turck is meeting these requirements with its new IMX interface series. With more compact housing dimensions, more accurate and faster devices, SIL2 certification and several international Ex approvals for worldwide use, Turck is raising the standard for interface technology to a new level.

The devices of the IMX12 series can be used seamlessly in a voltage range from 10 to 30 VDC. This opens up the possibility of use in new applications that are supplied from batteries, PV collectors or small wind turbines.



ably in one device. This is what Turck has managed successfully with the IMX series: The devices will be comprehensively approved for Europe, North America, South America, China and Asia, and are provided with UL, FM, ATEX, Nepsi, Kosha, Imetro and IEC-Ex certification. Shipping approvals will also be available in the near future. The global approval portfolio of the IMX series enables the customer to operate the devices reliably at different locations worldwide.

#### Minimum space requirement

While Turck's MK series required almost three centimeters in width for nearly twenty years in order to process one temperature signal, the current IM series only requires 18 millimeters for the same task. The new IMX series now only requires 6.25 millimeters per temperature signal. Thanks to the small 12.5 millimeter housing width, and up to four terminal banks per side, these devices achieve a channel density that is unrivaled on the market. The space requirement on the DIN rail for the isolating switching amplifiers with a relay output (2-channel 4-wire resistance temperature sensors) has even been reduced to half of that required by the IM series. Thanks to the four removable terminal banks, only those terminals concerned have to be removed, even when replacing three-wire sensors.

#### Maximum accuracy

Turck has managed to increase the performance of the new series in spite of the small mounting width – in terms of accuracy as well as in terms of speed. This is highlighted particularly with the IMX12-AI EX analog signal isolator. The new electronic design makes it considerably less sensitive to external factors such as temperature or voltage fluctuations. The effect of the interface device on the overall performance of a complete measuring circuit is thus considerably reduced. The device operates much more accurately

and thus meets the increased demands of the field devices for accuracy.

However, the linearity error of the devices is not the only factor considered with regard to accuracy. Many other error factors, which often only appear in the small print of the manufacturers' data sheets, should not be ignored. Data sheets cannot be used as the sole basis of device comparisons. Ambient influences such as temperature, power supply fluctuations or changes in the connected load can have a considerable effect on the performance of devices. Turck specifies these errors and field conditions, and includes effects such as repeatability and hysteresis in the total error calculation. The so-called total performance is calculated from this together with the temperature coefficient. It does not reflect abstract laboratory conditions but the performance in the field. It has been verified that the analog signal isolators and temperature measuring amplifiers of the IMX series have the best overall performance in terms of accuracy of all 12.5 mm interface devices.

#### 15000 Hz measuring frequency

The IMX12-DI EX isolating switching amplifier also offers maximum values in terms of speed. Input frequencies, which were previously the reserve of special frequency transducers, can be transferred inexpensively, reliably and in a minimum of space. With up to 15,000 Hz, measured values can be optimally resolved, enabling precise measuring without the negative effect of a signal conversion. Thanks to the high measuring frequency, analog measuring values can be transferred with a high resolution and accuracy. The normal temperature coefficient, which usually has a considerable influence with analog measurements, is unnecessary. No other isolating switching amplifier on the market can achieve this to date.

#### Process industry, skids and stand-alone units

The process industry, with the chemical, pharmaceutical and oil and gas sectors in particular, are the principal target sectors for interface devices. A new special feature of the IMX series will enable Turck to also provide solutions that were previously not possible in some applications: The devices of the IMX12 series can be used seamlessly in a voltage range from 10 to 30 VDC. This opens up the possibility of use in new applications that are supplied from batteries, PV collectors or small wind turbines. This possible use in smaller mobile and autonomous installations makes the IMX devices particularly interesting for manufacturers of small to medium-sized plants. Thanks to the international approvals available, manufacturers of centrifuges, decanters or biomass power stations can use the new interface devices in plants for worldwide export.

#### Growing portfolio

Besides devices for standard digital input/output signals and analog input/output signals, the range of the IMX12 product series includes temperature



Up to four 2-pole terminals – each on the Ex and non-Ex side – can now take 2-channel temperature measuring amplifiers in 4-wire PT100 connection technology

measuring amplifiers and speed transducers in different designs. Turck is presenting the first devices of the IMX series at the Achema fair: the IMX12-TI 2-channel temperature measuring amplifier, the IMX12-DI Ex isolating switching amplifier, the IMX12-DO valve control module, as well as the IMX12-AI EX HART analog signal isolator and the IMX12-AO HART output analog signal isolator. The IMX series will later be expanded into a complete interface device series which meets all the requirements of the target markets in the coming years. In other words, long-term investment security for customers is absolutely ensured.

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