

Modular I/O devices support hot-plug function

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Abstract
 The TB20 I/O device family by Helmholz comes with CAN and CANopen interfaces. Details drawn from real-life experience – such as the deliberate design of the modules in three parts – ensure easy integration and configuration. The devices featuring analog and digital I/Os are hot-pluggable.

In industrial automation, input and output modules still predominantly incorporate the concept of a centrally controlled topology. This is the case even though it has long been known that decentrally wired alternatives can provide significant setup, maintenance and operational benefits. The TB20 I/O system is characterized by the influence of extensive customer feedback based on practical usage. This step towards our own decentralized I/O solution is not just a deliberate extension of the product range. More important is the fact that with decentralized modules, the components are smaller and therefore save space. The task of wiring everything together is significantly reduced. In addition, a single I/O system will suffice even in the case of different PLC systems. This, in turn, results in significant business opportunities for control systems for traffic management or building automation.

All technical features of TB20 are targeted at supporting the development aims of efficiency and optimal use. In real terms that means rapid and simple installation and maintenance. For example, the power module is already integrated into the bus coupler, and up to 64 modules can be connected to the coupler. The



Figure 2: The three-part design allows an easy configuration and supports the hot-plug of modules

modules are made up of three parts: the basic module can be simply snapped onto the rail. The electronic module and the front connector are then clipped on, just as simply, using a locking mechanism. In the same way, all parts can be removed for maintenance.

Handling is aided further by the ergonomic form of the housing. Despite their compact, space-saving dimensions, all system components are mechanically stable and designed for use in industrial environments. Prerequisite is a special plastic that has been used successfully in other products. The I/O family is scalable. Modules are available for two, four, eight and even 16 channels, a granularity that ensures the minimum of unused channels. This in turn reduces the price per channel. In addition each module is fitted with a freely usable auxiliary clamp, that can be used flexibly, for instance for additional voltage, screen or earth.

Last but not least, the design facilitates a clear and unambiguous labeling of the channels using description strips that can be

printed on a laser printer. Even in assembled state these are easily visible and thus ensure an unambiguous allocation of the terminal clamp to the corresponding channel LED.

All devices can be configured easily, leading to rapid commissioning. A separate factory-coding of the modules avoids errors due to mistake or mix-ups. The hot-plug capability is one of the system's most convincing features: It means that individual modules can be removed from the overall system while leaving the remaining parts running. Any electronic module that fails is easily replaced and thus immediately available for usage, reducing downtime to a minimum.

At the same time, the capability to partially shut-down the system simplifies root-cause testing in the case of faults. The hot-plug capabilities of the system also mean that flexibly adapting to changed requirements is trouble-free. Using the corresponding separation modules, security functions can be implemented. In the case of malfunction, the corresponding power circuit is simply switched off. This continuous-development process ensures that we can always respond to customer inquiries and new, industry-specific requirements. Thus, our engineers are already concentrating on the integration of further I/O functions, such as communication modules, counters and pulse-width-modulation (PWM). ◀

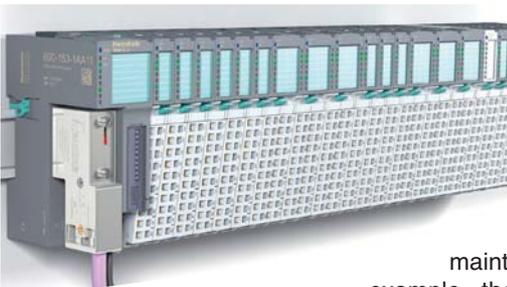


Figure 1: Scalable I/O devices with analog and digital ports

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