

PROFIdrive and ENCODER news

Drive profiles free the user program from device-specific details. The more versatilely and comprehensively a drive profile can be used, the greater the benefit. With six application classes for PROFIBUS and PROFINET topologies, PROFIdrive covers a very wide range of applications. The new V5.1 profile tester combines extremely simple operation with support during development and certification and can now also test drive-based safety. The new V4.2 encoder profile has also been released. The technical specifications can be found on the PI website (PROFIBUS & PROFINET International).

Every manufacturer and every operator of machines is today striving to save time and money by using both general as well as in-house standards in as consistent a manner as possible. Automation, in particular, can benefit greatly from standards as they reduce the complexity – in hardware and software, only those components are individualized where no standard yet exists. From engineering to installation, commissioning, maintenance and diagnosis to system expansion: the consistent use of proven and known conventions, standards and norms simplifies and accelerates every phase of machine construction and upkeep.

An interoperable, standardized and vendor-neutral drive interface ...

On the drive level, probably the best example of successful standardization is the vendor-neutral drive profile PROFIdrive. With an interface that is easily understood by the user, it covers all industrially relevant application fields of variable-speed drives. This ranges from simple speed control for standard drives to positioning tasks, from the use of drive-integrated technology functions to servo applications in machine tool engineering as well as high-performance axis-groups of complex motion-control applications operated with position synchronicity.

For this purpose, the PROFIdrive profile defines a generally valid drive interface as well as the corresponding functionality of the drive. So that users only need to work with the data and signals relevant to their specific application, drive tasks that arise in practical use are divided into six application classes. In spite of its comprehensive approach and suitability for an extremely wide range of applications, the PROFIdrive profile remains very manageable in practical use.

...for time-sensitive networking

The application model on which the PROFIdrive profile is based is designed and implemented independent of the communication medium. By separating the application and communication levels, users of the PROFIdrive profile benefit from further developments and performance improvements in communication technology – without needing to change existing application programs. That this actually functions in practical use is proven with the step from PROFIBUS applications to Ethernet-based topologies: from the perspective of the user program, data exchange with the drives is identical under PROFIBUS and PROFINET; changes in the control of the drives are not necessary when switching from PROFIBUS to PROFINET. Through this generic model approach, PROFIdrive users today benefit from Gigabit Ethernet variants or wireless Industrial WLAN, used increasingly in industrial applications, and – in the future – from new communication technologies such as TSN (Time Sensitive Networking) and parallel OPC UA applications.

International standards and certificates ensure vendor-neutral interoperability of devices and systems

Since 2007, the PROFIdrive profile has been standardized in IEC 61800-7. The interoperability of hardware and software from various product series and manufacturers is ensured if the PROFIdrive implementations of the participating devices and systems bear the PI certificate. It is granted by PI-authorized test laboratories. The “PROFIdrive Profile Tester” is available as a uniform standard during the development and testing of PROFIdrive-compatible drives. This tool verifies the compatibility with the profile specification and thereby ensures the vendor-neutral interoperability of all functions of a drive relevant to the PROFIdrive profile. Performed with the new version V5.1 are, among other things, PROFIdrive on PROFIsafe tests (STO, SS1, SS2, SOS, SLS), expanded alarm diagnostic tests, encoder V4.2 test cases and other new features with current test scripts

Encoder profile simplifies device replacement

The new version 4.2 of the Encoder profile for PROFIBUS and PROFINET communication has been expanded with safety functions; there is thus now also an interoperable safety interface. As a result, system and machine manufacturers will be able to draw upon a comprehensive portfolio of interoperable encoders with PROFINET and PROFIBUS interface, saving time and costs. Interoperability means that drives/encoders from different manufacturers can be operated on a controller without needing to modify the motion application. In PLC-based motion applications, this can save time and money, since it is possible to utilize ready-to-use function blocks; with special motion controllers such as CNC and RC controllers, PROFIdrive is required even to connect a drive.

Used for the interoperable connection of encoders on servo drives are, for example, the Biss, Endat or Drive-CliQ standard interfaces, whereas for encoders with PROFINET/PROFIBUS interface the Encoder profile from PI is used. In addition to the communication services, it defines the semantics of the exchanged data as well as standardized application models for position and speed sensors, thereby enabling a vendor-neutral interoperability. For this purpose, the Encoder profile defines a series of so-called standard telegrams for cyclical data traffic. These stand for a firmly specified set of position and speed signals with the corresponding defined data format.

For testing the implementation of the Encoder profile, the proven PROFIdrive Profile Tester was expanded with the appropriate test cases. Like the PROFINET IO Tester, the Profile Tester is available with the encoder test scripts at no charge for PI members. Thus, all encoder manufacturers have the ability to use the test system during the development process so that they can then begin the certification test using a pre-tested device. The encoder certification test is performed by the proven PROFIdrive test laboratories, most of which are also competence centers for the Encoder profile.

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