PROFINET PROFILE FOR SAFETY APPLICATIONS

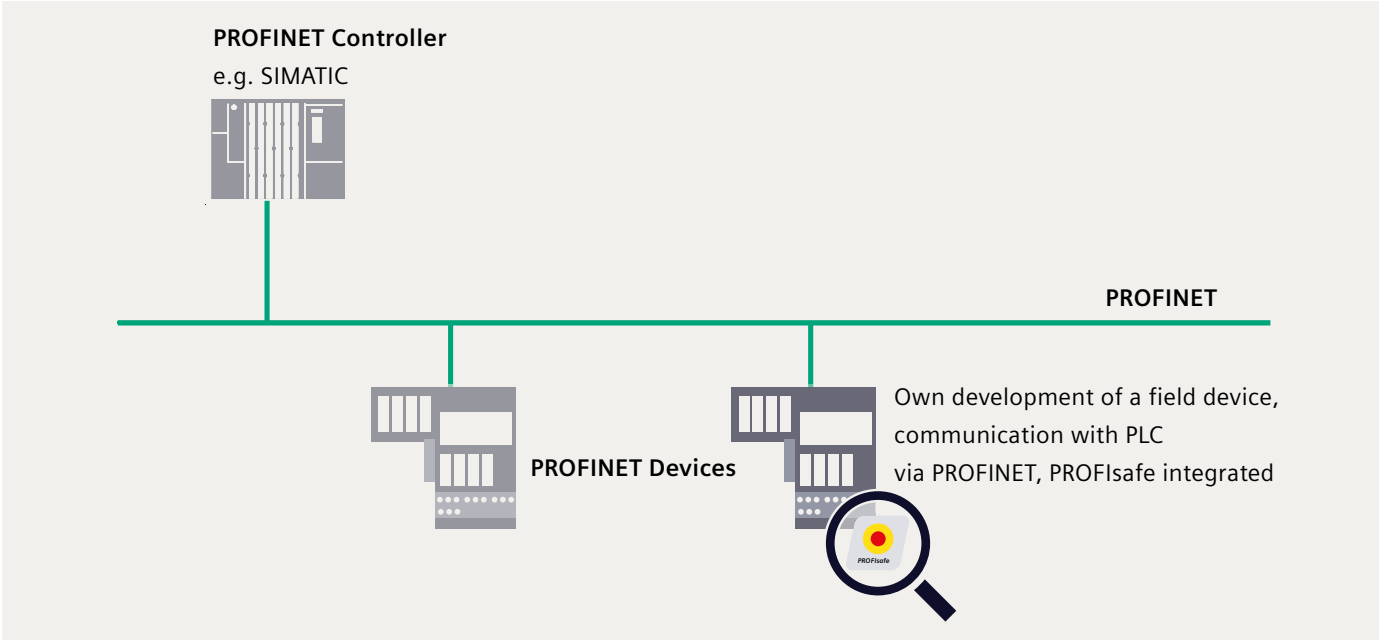
PROFIsafe – Create fail-safe field devices faster

Implement safety applications more easily and reliably. PROFIsafe facilitates the realization of safe plants and machines on the basis of PROFINET via a communication line (wired or wireless) – without a second, separate bus system. Moreover, the transmitted telegrams are continuously monitored.

Functional safety is a serious consideration in automation. The PROFIsafe starter kit can be used to easily implement failsafe field devices. Sample implementations for easy connection to ERTEC platforms are available for the PROFIsafe stack.

F-messages between an F-host (safety controller) and its F-device are transported as payloads in PROFINET telegrams.

The PROFIsafe protocol eliminates the need for users to evaluate the safety of their individual backplane bus system or other channels beyond PROFINET. It guarantees the functional safety of the entire path, from the sender of an F-signal, such as an F-module in the remote bus terminal, to the receiver, the F-host, and vice versa. This is achieved by additional safety measures in the F-messages.



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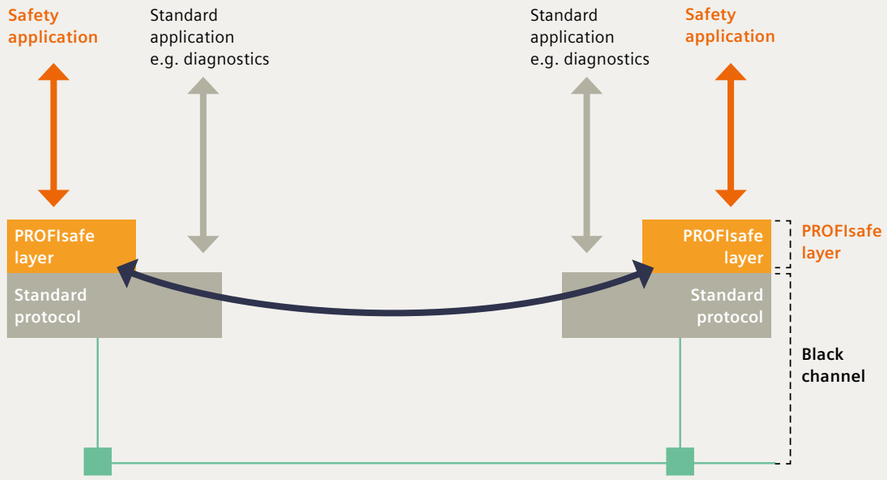
Data transfer with PROFIsafe
PROFIsafe is defined in IEC61784-3-3 as the protocol for implementing functional safety (fail-safe), and is recognized by IFA (industrial safety institute of the DGUV, German Social Accident Insurance) and TÜV. PROFIsafe can be used equally with PROFIBUS and PROFINET.

Fail-safe (F) is the ability of a system to safely protect against hazards or reduce the risk to an acceptable level through the use of appropriate technological and organizational measures.

Transmission channels
By using PROFIsafe, you can transmit fail-safe elements on the same network as standard, non-secure process data, with no need for additional wiring.

With PROFIsafe, the transmission channels are transparent. This is known as the “black channel” principle.

Transmission channels as pure black channels for PROFIsafe



(Industrial Ethernet) PROFINET, PROFIBUS, backplanes, wireless

PROFIsafe starter kit
The PROFIsafe starter kit includes the following components:

- PROFIsafe driver (source code)
- CRC check tool
- Sample implementation

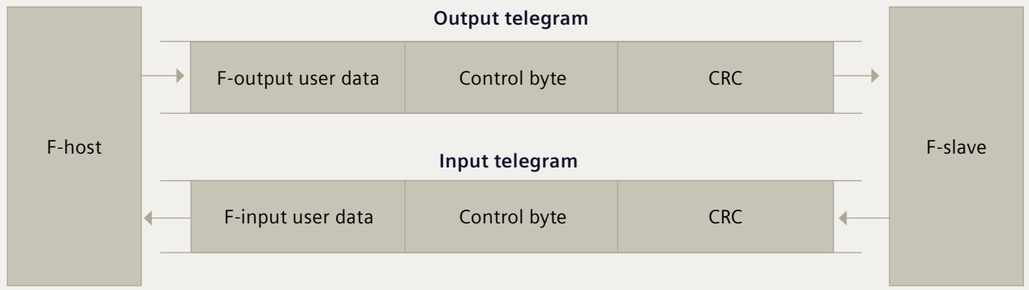
> Learn more about the PROFIsafe starter kit

The PROFIsafe driver (PSD) is a firmware module for F-slaves/F-submodules. It contains the monitoring mechanisms for safety-oriented communication as specified in “PROFIsafe – Profile for Safety Technology on PROFIBUS and PROFINET (IEC61784-3-3).” The PSD allows manufacturers to easily connect their F-Slaves to an F-communication partner (F-host) via fail-safe communication using a standard PROFINET.

Equipment manufacturers can use the PSD to develop an F-slave with fail-safe, point-to-point communication via PROFINET. The PSD can be integrated in various runtime environments (hardware/firmware environments) through “generation.”

Safe communication between F-host and F-slave
The essential task of the PSD is to exchange user data with an F-host and the resources necessary for F-parameterization according to the specifications of the PROFIsafe profile Version 2.6MU1. The layout of a full input/output telegram corresponds to the definition in the PROFIsafe profile.

Structure of F-telegrams



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