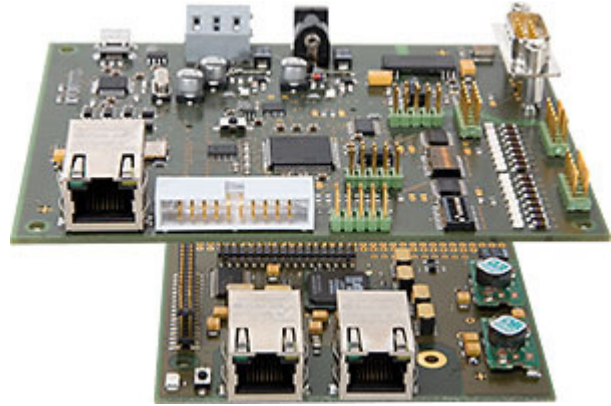


## Ways towards SafetyNET p Interface

Acceptance of an industrial communication system among manufacturers of automation devices depends on the use of simple, flexible and economical implementation options. These requirements have been considered on SafetyNET p, in that various options are available for the implementation of SafetyNET p devices. The manufacturer can therefore reduce the effort required for interface implementation to a minimum.



Basically the application layer of RTFL and RTFN devices are identical. RTFL and RTFN implementations differ only in the transport layer. The application layer is implemented as software on a microcontroller. This may be the same microcontroller as the one containing the application itself. With safe devices, a redundant-channel architecture is often required. To implement the safe application layer, at least two microcontrollers should be available to process the safe protocol stack. Especially in RTFN devices these may be the same microcontrollers as those on which the application for the automation device is implemented.

### RTFL – transport layer – implementation

The RTFL communication requires additional hardware support in the form of an FPGA (field-programmable gate array). Two options are available for the RTFL transport layer implementation. The implementation by means of pre-programmed FPGA or Implementation using IP core in specific FPGAs. The task of the SafetyNET p FPGA is to forward Ethernet frames with a short latency period and process at high speed. Normally these requirements cannot be met in RTFL by a standard MAC controller. Furthermore, the high-precision real-time clock mechanism (PCS) is integrated into the chip.

### RTFN – implementation

RTFN requires no special hardware support; in other words, RTFN can be implemented in the form of a driver on a normal PC with a standard Ethernet card and TCP/IP stack.

Standard Ethernet protocol analysis tools such as the open source software Wireshark can be used for SafetyNET p. Plug-ins are available for Wireshark to analyse the SafetyNET p data traffic. An effective evaluation kit can be procured for evaluation purposes via Safety Network International e. V. It consists of an eval board, SafetyNET p protocol stacks and an IDE for simple development and testing of RTFL and RTFN communication interfaces. All documents required for the implementation of SafetyNET p such as specifications and the hardware and software protocol stacks, can be procured through Safety Network International e. V. The organisation supports its member companies devices during the entire integration process.