

### 5.1.3.1 HiSLIP protocol

The High Speed LAN Instrument Protocol (HiSLIP) is the successor protocol for VXI-11 for TCP-based instruments specified by the IVI foundation. The protocol uses two TCP sockets for a single connection - one for fast data transfer, the other for non-sequential control commands (e.g. `Device Clear` or `SRQ`).

HiSLIP has the following characteristics:

- High performance as with raw socket network connections
- Compatible IEEE 488.2 support for Message Exchange Protocol, Device Clear, Serial Poll, Remote/Local, Trigger, and Service Request
- Uses a single IANA registered port (4880), which simplifies the configuration of firewalls
- Supports simultaneous access of multiple users by providing versatile locking mechanisms
- Usable for IPv6 or IPv4 networks



Using VXI-11, each operation is blocked until a VXI-11 instrument handshake returns. However, using HiSLIP, data is sent to the instrument using the "fire and forget" method with immediate return. Thus, a successful return of a VISA operation such as `viWrite()` guarantees only that the command is delivered to the instrument's TCP/IP buffers. There is no confirmation, that the instrument has started or finished the requested command.

For more information see also the application note:

[1MA208: Fast Remote Instrument Control with HiSLIP](#)

### 5.1.3.2 VXI-11 protocol

The VXI-11 standard is based on the ONC RPC (Open Network Computing Remote Procedure Call) protocol which in turn relies on TCP/IP as the network/transport layer. The TCP/IP network protocol and the associated network services are preconfigured. TCP/IP ensures connection-oriented communication, where the order of the exchanged messages is adhered to and interrupted links are identified. With this protocol, messages cannot be lost.

### 5.1.3.3 Socket communication

An alternative way for remote control of the product is to establish a simple network communication using sockets. The socket communication, also referred to as "Raw Ethernet communication", does not necessarily require a VISA installation on the remote controller side. It is available by default on all operating systems.

The simplest way to establish socket communication is to use the built-in telnet program. The telnet program is part of every operating system and supports a communication with the software on a command-by-command basis. For more convenience and to enable automation by programs, user-defined sockets can be programmed.