

# RT-LAN

## Networking software for RTOS-UH

**RT-LAN** is a modular program package for RTOS-UH to provide for communications over Ethernet. The commonly used TCP/IP protocol gives interoperability with different computers using different operating systems.

A well designed application programming interface eases the addition of networked functionality to control systems. **RT-LANs** modular design allows the use of multiple network interfaces simultaneously.

With the **Serial Line IP** a point-to-point network communication between two computers can be established. Several services can run at the same time using only one serial connection.

The **User Datagram Protocol** allows for immediate communication with low overhead, but does not provide a reliable communication path. The sender is not informed about the reception of data packages. The loss of data packages is possible, and it is not verified, that packages are received in the order they were sent. Nevertheless, the contents of a received package is guaranteed to be correct.

The **Transmission Control Protocol** is a connection oriented protocol, that guarantees either to fail or to deliver correct contents in correct sequence. As drawback, the timing of communication is not dependable. Most internet services are based on the TCP protocol.

The **File Transfer Protocol** is based on TCP/IP and provides the transmission of files. The **FTP** uses the client/server-model:

- The **FTP** server provides remote access to the local file system. Sending as well as receiving of files is supported.
- The **FTP** client uses the service provided by an **FTP** server. A command interpreter initiates file operation according to user input.

**FTP** is a presentation level application using TCP/IP. **FTP** is commonly used as least denominator for file exchanges between different operating systems.

### Network

**SLIP**

**UDP**

**TCP**

**FTP**



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## SMB

The **SMB** protocol is specifically designed to communicate with computers using a Microsoft Windows operating system. It provides file and printing services. The file system of a computer running RTOS-UH is accessible by the graphical user interface of a PC.

## Telnet

The **Telnet** protocol provides remote access to the command interface. A computer running RTOS-UH can be operated remotely.

- the **Telnet** server provides access to a local command shell. In the standard configuration, RTOS-UH provides upto 5 logins simultaneously.
- the **Telnet** client provides access to the command interface of a remote system.

**Telnet** is a presentation level application using TCP/IP.

## Web server

A web server is commonly used to deliver either static or dynamic contents to clients using the http-protocol in conjunction with contents formulated in the HTML-language. In contrast to e.g. **Telnet** or **FTP**, the web server uses only short living connections and, therefore, uses less resources on the server.

The RTOS-UH web server allows delivering of dynamic contents with a programming interface accessible to application programmers using ANSI-C or PEARL90.

## Profibus

The **Process Field bus**, FMS, is a deterministic field bus, standardized in EN50170, for communications on cell level. It is based on the dependable timing of a token bus and provides both multi-master and Master/Slave communications. RTOS-UH supports Profibus-FMS with drivers for the MC68302 or MC68360-processors at data rates upto 1,5 MBaud with economical 3-wire RS-485 cabling.

Profibus-DP is used as sensor/actuator bus with data rates upto 12 MBaud in direct competition to the InterBus-S. RTOS-UH supports Profibus-DP with a driver for the Siemens ASIC.

## InterBus-S

The InterBus-S is a highly efficient sensor/actuator bus with strict deterministic timing, developed by the Phoenix contact company. A broad range of I/O-modules is available from various manufacturers. RTOS-UH supports the InterBus-S by drivers for different interface boards, e.g. for the VMEbus.

Our modular controller system MOCS-1100 (on basis of the MC68332) provides an InterBus-S master with remote and local bus connection.

## OSI SINEC-H1

On the same physical Ethernet interface, RTOS-UH supports an OSI protocol stack as well as TCP/IP. With the use of the OSI protocol stack, RTOS-UH can be integrated easily into e.g. a SINEC-H1-network as commonly used by the Siemens S5 PLC. RTOS-UH supports OSI-layer-4-communication.