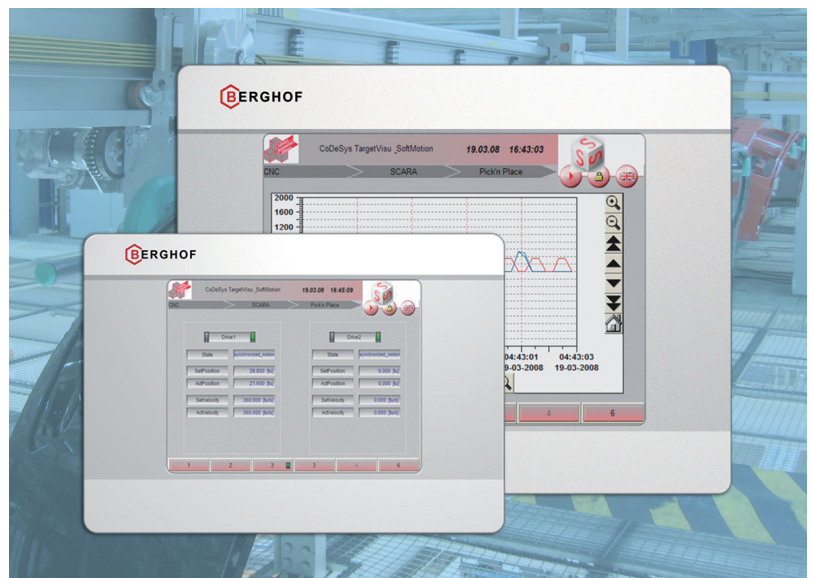


Controls / PLC controllers

## Ethernet terminals revolutionise PLC visualisation

As a rule today, new requirement profiles for machinery and plants call for consistent Ethernet networking. This is combined with the objective of reducing software costs and simplifying installation. Especially with PLC visualisation there is still great potential for rationalisation. In this field a new generation of Ethernet terminals in the form of “Ultra Thin Clients” are destined to revolutionise the market.

Manufacturers like Berghof Automation Engineering in Eningen are already offering field-tested solutions.



### Brief description

To date established operating concepts for PLC-controlled machines and plants usually use two software components: A PLC program, and to go with it, a visualisation program with the interface description.

Common serial interfaces or field bus interfaces are used for communication. A separate visualisation interface plus two software components? This is definitely too much expense and effort for administration and maintenance, especially as everything is supposed to work straightforwardly via Ethernet interfaces. Hence from now on innovative Ethernet terminals will be pushing onto the market as an inexpensive alternative. This entails a PLC program, and to go with it, a visualisation program containing the interface description. Common serial interfaces or field bus interfaces are used for communication.



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Marketing Manager  
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### PLC visualisation à la PC

“We are introducing 'Server-based PLC visualisation' to PLC visualisation in the sense of an Ultra Thin Client Technology”, Jürgen Wanner, Product and Marketing Manager at Berghof Automations-technik GmbH, states.

This entails terminals connected via Ethernet and with an Info screen, display menu and simple interaction options. The new Ethernet terminals from Eningen therefore convey a technology into the Middle World of PLC, which has been reserved for large PC-based controllers to date. In Jürgen Wanner's opinion: “This can indeed be referred to as a minor revolution from the point of view of both technology and business”.

### An affordable hardware base

With the new Ethernet terminals the trend is very clearly towards “slimmed-down terminals”, as Jürgen Wanner puts it.

Ideally they practically consist of only one processor with a memory, graphic interface and the ports for the touch screen and the keyboard.

Only what is needed to display the visualisation runs on the operating system. However, all the application programs are integrated into the central PLC controller. The Ethernet terminals merely serve as an extension for inputs and outputs.

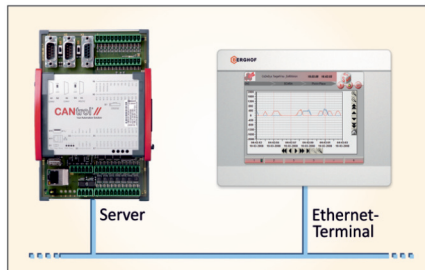
### Advantages at a glance

#### Low operation costs thanks to:

- Networking via Ethernet TCP/IP
- Affordable standard components
- Central data management in the PLC
- Can be accessed by every client-down to a cell phone
- Minimal purchasing and maintenance costs

## One central software: display over IP

The new terminal-server concepts via Ethernet offer effective ways of keeping software available centrally. All the visualisation masks are part of the PLC program.



PLC controller as a terminal server which conveys the visualisation to the Ethernet terminal via Ethernet and receives the operator's inputs via the same path.

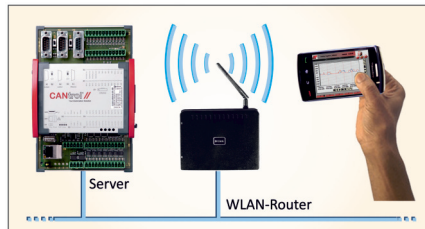
The Ethernet terminals access only the visualisation and therefore manage without a second tool, or indeed lists of variables. In a best-case scenario everything still runs on a joint platform, such as for example, CoDeSys as is used by Berghof. In detail this involves an intelligent graphic interface to the live display of the CoDeSys target visualisation. The visualisation data are transmitted by the CoDeSys controller via Ethernet.

## The application continues to run also without the terminal

If a conventional input terminal crashes the data and settings are lost. With the Berghof Ethernet terminals this cannot happen because where there are no programs running, nothing can be lost. Therefore the loss of data is virtually excluded and downtimes are also minimised.

## Can be accessed by every client - even including a cell phone

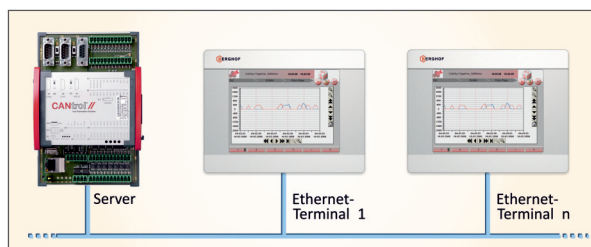
At Berghof the server application on the PLC controller is based on a universal VNC communication interface (refer to text in the box). Hence the screen content can be accessed both from Berghof Ethernet terminals and quasi from any remote computer (client), for example from an app on a smartphone.



The screen contents can be accessed and from any remote computer, such as, for example, from a smartphone.

## The visualisation simply moves along with it

Ethernet terminals also make the work on geographically widely-distributed systems more efficient. If the operating concept of a machine or plant requires multiple Ethernet terminals, the PLC controller must ensure that all client terminals have secure access to the PLC visualisation.



The PLC controller must ensure that all client terminals have secure access to the PLC visualisation

The Ethernet terminals must automatically connect up with the server – the PLC controller – and display the visualisation when the system boots. At Berghof this is done by a CANtrol controller, for example. While the machine operator makes inputs on the terminal, all other Ethernet terminals switch to a pure display mode.

## Less space required for installation

Another highlight of the new Ethernet terminal generation is the smaller space required for its installation. The intelligence is located in the PLC, and the many different connections are omitted and replaced by the continuous and space-saving Ethernet connection. For the mechanical engineer this means that all versions of the Ethernet terminals are distinguished by very small installation dimensions which would have been impossible to achieve a few years ago.

The smallest version of the Berghof Ethernet terminal contents itself with the following outer dimensions: H x B x D = 85 x 115 x 35.7 mm; the cut-out for installation is just 77 x 108 mm for H x W; a compact housing with minimal dimensions.

For a broad field of applications, manufacturers like Berghof offer scalable modular solutions ranging from 3.5" with ¼ VGA displays for decentralised operating stations, through to displays with larger diagonals for more efficient plant visualisation, e.g. 5.7" with a VGA display and touch screen.

## Ethernet terminals via VNC (Virtual Networking Computing)

VNC (Virtual Network Computing) ensures that the data of a server or PC are displayed on one or more a local client in such a way that they all display the same contents. It is easy for state-of-the-art Ethernet terminals to avail themselves of this technology. The greatest advantage is the feasibility of remote maintenance or remote control; the inputs are sent from any client to the server via VNC. This makes it possible to work at a distance on a remote client and you do not have to be locally present to make the input. The technical options go as far as enabling access via a cell phone. Contrary to other remote maintenance software, VNC has the advantage that it can be used irrespective of a platform..

## Proven in practice

Berghof's Ethernet terminal concept has passed initial performance tests.

Berghof Ethernet terminals can communicate equally well with Windows and Linux computers. They are distributed display systems and input terminals, all in one.