

FAQs for serial Com-Server:

Commissioning, configuration, troubleshooting

How does a Com-Server get its IP address?**How** does the Com-Server find the valid subnet mask and gateway address?**How** can a Com-Server with an unknown IP address be assigned a new one?**How many** IP addresses does a Com-Server having more than one serial port require?**Why** doesn't the IP assignment function using a static entry in the ARP cache?**Why** can't I assign the IP over the serial interface?**How** in DHCP environments is the Com-Server prevented from getting an unwanted IP address?**Is there** a facility of assigning the IP address without a PC via the serial interface?**How** can the Com-Server be reset to its original settings (factory defaults)?**Why** does the configuration menu of the Com-Server not appear for a Telnet connection?**Where** can I find current versions of the firmware, manuals, tools etc. for the Com-Servers?**Why** doesn't the Com-Server output any data on the serial interface?**How** can a record of the network traffic be recorded?**How** can Com-Servers be inventoried in the network?**Why** after replacing a Com-Server can you no longer talk to the "new" one under the "old" IP address?

How does a Com-Server get its IP address?

For the Highspeed generation of Com-Servers, the following four alternatives are available for the first assignment of the IP address. Detailed outlines of all procedures are specified in the relevant section of the Com-Server Highspeed manual.

Management and inventorying tool WuTility

Using the *Scan* function of [WuTility](#), Com-Servers and Web-IOs located in the local sub-network are automatically searched for and shown in a list. Devices whose current IP address is 0.0.0.0 (= factory default setting) can then be assigned a valid address using the button *Assign IP address*.

Static ARP cache entry

Via a static entry in the ARP cache of a TCP/IP computer located in the same sub-network followed by a ping. In the same way as when using *WuTility*, this method can only be used if the Com-Server does not yet have an IP address at this point in time.

Input example in Windows: `arp -s [IP address] [MAC address]`

Assignment via the serial interface

If the Com-Server receives a continuous data stream during boot-up (data format 9600, n, 8) with content "x" (=ASCII 120), a prompt is generated making it possible to enter a new IP address. This method overwrites and functions regardless of whether an IP address has already been assigned or not.

Assignment via BOOTP / DHCP

In centrally administered networks, the IP address can also be assigned using a DHCP or BOOTP server. This method also offers the advantage that these protocols can also be used for setting the subnet mask and the gateway address. In such centrally administered environments, **before** connecting the Com-Server please contact your system administrator and ask him to reserve a fixed IP address in the DHCP system for the Com-Server.

Additional information:

Manual for the [Com-Server Highspeed](#)

[How in DHCP environments do you prevent Com-Servers from receiving an unintended IP address?](#)

How does the Com-Server find the valid subnet mask and gateway address?

In order to be able to communicate beyond the local network, in addition to the IP address, the Com-Server also requires the subnet mask and gateway address applicable for the relevant sub-network. The two values must be requested from the network administrator responsible.

Setting via the Telnet configuration menu

If the Com-Server already has an IP address, then the subnet mask and gateway can be assigned and saved via the Telnet configuration (telnet [IP address] 1111) from a computer located in the same sub-network.

Assignment via the serial interface

For Com-Servers starting from firmware version 1.37, the subnet mask and gateway address can also be configured via the serial interface. During the serial IP assignment, the values can be specified separated by commas, with no separating spaces.

Input example: `172.17.222.10,255.255.255.0, 172.17.222.1`

Assignment via BOOTP / DHCP

In centrally administered networks, the subnet mask and the gateway can also be assigned together with the IP address via the BOOTP or DHCP server.

Additional information:

Manual for the [Com-Server Highspeed](#)

How do you assign a new IP address to a Com-Server already having an unknown address?

The simplest and invariably effective method is to assign a new IP address via the serial port A with the aid of a terminal program. This method overwrites the existing setting, i.e. it is completely independent of the current setting of the Com-Server.

A second method is to reset the Com-Server to its factory default settings using the internal jumpers. If both of these are in at reset, the Com-Server carries out an internal self-test. After approx. 20 s this test ends by setting all the configuration values including the IP address to factory defaults. This again leaves all options open for assigning the IP address.

Additional information:

Manual for the [Com-Server Highspeed](#)

[How does a Com-Server get its IP address](#)

How many IP addresses does a Com-Server having more than one serial port require?

Only one! Which of the serial ports is accessed is determined by which TCP port number is used.

Although in practice one always speaks of "the TCP/IP protocol", we are really talking about two independent network protocols. IP is used to uniquely identify the network station while also providing routing mechanisms for cross-network communication. TCP is then layered over this protocol to use the addressing of port numbers for talking to an application running on the network device. This functionality becomes clear for example when you have a computer which is providing both an HTTP as well as an FTP server service at the same time. Both services are accessed through the same address, and differ only in their TCP port number (HTTP = 80, FTP = 21 etc.).

Additional information:

Manual [TCP/IP Ethernet and Web-IO](#)

Why can't I assign an IP address using a static entry in the ARP cache?

This method can only be used if the Com-Server does not currently have an IP address (see also [How do you assign a new IP address to a Com-Server already having an unknown address?](#)).

Some older Windows versions have a defective version of the program arp.exe, which is needed to edit the system-internal ARP cache. Here you can only make a new static entry if at least one other entry already exists. In this case, one remedy is to send a PING request to another TCP/IP station in the network, since this will force a dynamic ARP entry. The desired static entry can then be made immediately following.

Additional information:

[How do you assign a new IP address to a Com-Server already having an unknown address?](#)

Why can't I assign an IP address through the serial port?

1. The Highspeed series of Com-Servers have serial combination interfaces which can be reconfigured between RS232, RS422 and RS485 via a DIP switch. All other Com-Servers can be optionally configured by means of RS422 / 485 or in some cases also using 20 mA modules. It should therefore be checked first whether the interface of the computer being used and that of the Com-Server are the same.
2. As a standard ex works, the Com-Servers are pre-set to the RS232 interface, i.e. configured with an RS232 module. A so-called "rotated" or "null modem cable" must be used as a connection cable to a DTE-assigned 9-pole PC-COM port. Generally, cables used for connecting a modem are wired one-to-one and are therefore unsuitable.
3. Regardless of the serial transmission parameters set for normal operation, the Com-Server expects for entering the "x" characters (=ASCII 120) on boot-up *always* the transmission format 9600 baud, 8 data bits, no parity.
4. The terminal program used should be configured to "no Handshake" for assigning the IP address. Although the Com-Server sets its handshake outputs RTS and DTR to enable level upon starting, non-fully wired serial cable can cause problems. For serial IP assignment we recommend using our tool [Easyterm](#). Alternatively, it is of course also possible to use other serial terminal programs, such as e.g. *Hyperterminal* with direct connections to the relevant COM port.
5. The Com-Server responds only to lower-case characters "x" (=dec 120 = hex 78). If the CapsLock is inadvertently selected, the received characters will thus be ignored.

Additional information:

Manual for the [Com-Server Highspeed](#)

How do you prevent in DHCP environments the Com-Server from getting an unintended IP address?

The Com-Server uses the DHCP-compatible BOOTP protocol to avoid this problem. In contrast to DHCP, this is based on fixed (stored in a corresponding database) reservations of certain IP addresses for certain MAC addresses. This means a DHCP server in the network will not assign an IP address without a corresponding entry for the MAC address. Since some DHCP implementations (e.g. Win2000 servers) however use their standard setting to treat BOOTP and DHCP requests the

same, we recommend deactivating the BOOTP client of the Com-Server if you want to send the IP address serially or via ARP. There are two ways to turn it off:

- per Telnet configuration for Com-Servers already in operation
- serially by appending the characters "-0" behind the IP address.

Note: DHCP/BOOTP protocol is only available in Com-Servers having NO coax terminal.

Additional information:

Manual for the [Com-Server Highspeed](#)

Is there a facility for assigning the IP address via the serial interface without a PC?

If you have a handheld PC (e.g. a palm), you have the facility of assigning the IP address via the integral serial interface of the handheld PC. Suitable terminal programs for handheld PCs can be found on the Internet.

Because it has proven difficult to enter the expression 'xxx' with the input pen in the available time, you are recommended to use the macro function which is provided by nearly every program.

How do I reset the Com-Server to its factory default settings?

1. The standard way to recreate the factory default settings is by means of the Telnet configuration under port number 1111. After selecting the corresponding menu item in "*System setup*" and then confirming with "Y", the Com-Server closes the Telnet session, performs a reset and loads its factory settings. The IP address is then reset to 0.0.0.0, which allows you to reassign it using a static ARP entry (see also Note)
2. If the current IP address of the Com-Server is unknown or if it doesn't fit into its own network, the factory settings can also be restored through hardware. To do this, the board has 2 jumpers which are open (out) for normal operation. Proceed as follows:

- Turn off power to the Com-Server and open the housing.
- Close (insert) both jumpers.
- Restore power to the Com-Server.
- After a wait time of approx. 20 s, you can disconnect the power and open the jumpers again. The Com-Server is now reset to its factory default settings.

Closing the jumpers initializes a self-test which is designed for the W&T test bench and which will only run properly there. The serially output error messages can thus be ignored. The only critical feature here is the fact that the self-test always ends by restoring the factory default settings.

***Note:** For a possible check of whether the Com-Server is really switched to its factory settings, the dynamic ARP entry previously generated by the last Telnet session must first be deleted. If this is not done, the Com-Server takes the destination IP address contained in the first of the packets directed to its MAC address and stores it as its own. Command for deleting an ARP entry: arp -d [IP address]*

Additional information:

Manual for the [Com-Server Highspeed](#)

Why does the Com-Server configuration menu not appear for a Telnet connection?

The Com-Server configuration menu is only available through TCP Port 1111. If the connection is established from the Telnet client without expressly specifying Port number 1111, the standard Telnet Port 23 is assumed. Under Windows the Com-Server configuration is most quickly run from "*Start > Run...*" using command line *telnet [IP address] 1111*.

Additional information:

Manual for the [Com-Server Highspeed](#)

Where can I find current versions of the firmware, manuals, tools etc. for the Com-Servers?

The quickest way is via the insider search available on our homepage. Specify the article number of the relevant Com-Server and select the desired item from the menu below that.

Why doesn't the Com-Server output data on the serial port?

All Com-Servers use hardware handshake as the standard. Here data are only sent to the serial terminal device if the CTS control input has an enable level. If it is unclear which handshake procedure is supported by the terminal device or connection cable, you should first set the Com-Server to "No Handshake". In this mode the port signals send enable on all outputs, and all data are sent regardless of the level of the control inputs.

Additional information:

Manual for the [Com-Server Highspeed](#)

How can a record of the network traffic be recorded?

In the case of all terminal equipment that is connected to a network, communications problems can occur for which there would appear to be no reason at first glance. In such cases, it is helpful to record the data traffic of this equipment by means of a network analyzer. Notes on the procedure can be found [here](#).

How can Com-Servers be inventoried in the network?

WuTility

With the help of the free Com-Server Management and Inventory tool [WuTility](#) for Windows. This automatically finds all Com-Servers located in the respective subnet (including those with no valid IP address) and creates a list with the most important basic information. Other functions include direct starting of the Telnet configuration, initial assignment of IP address as well as copying of configuration profiles between the Com-Servers.

SNMP

SNMP-based central management is frequently found particularly in large networks. The latest generation of all Com-Servers and Web-IOs has an SNMP Agent which enables integration in these environments. In addition to the MIB-II, a Com-server-specific MIB (private MIB) is also supported.

Additional information:

Manual for the [Com-Server Highspeed](#)

Why after replacing a Com-Server can you no longer talk to the "new" one under the "old" IP address?

The reason for this often has to do with the close (time-wise) use of an identical IP address for 2 devices having different MAC addresses. TCP/IP stations tend to use a dynamically administered ARP table which contains the associations of IP with MAC addresses. If a replacement Com-Server having the same IP address as its predecessor is installed, before resuming communication you may have to delete the "old" ARP entry in the last device to process the IP protocol from the Com-Server.

After a certain time, ARP entries are deleted automatically with no data flow, so that, if a longer interval elapses between device replacement and the reestablishment of communications, it is possible to do without the manual deletion. Above and beyond that, when restarting, the Com-Server generates special ARP packages which have the function of updating the ARP cache of newer TCP/IP stacks and switches.

Example 1: A Windows machine communicates without use of a router with a Com-Server in the same IP subnet. In this case it is sufficient to use the following command to delete the no longer valid ARP entry: `arp -d [IP address]`

Example 2: Communication with a Com-Server is through one or more routers. After an exchange, the ARP entry of the last router (gateway) in front of the Com-Server must be deleted. The specific procedure can be found in the documentation supplied by the respective manufacturer.

Note: Since switches also process and save the MAC addresses of the connected devices, these must also be taken into account when replacing a device.



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