

FAQs for the Web-IO Digital:

Commissioning, configuration, troubleshooting

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How can Web-IOs be inventoried in the network?

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

How does a Web-IO get its IP address?

For the Web-IOs, 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 Web-IO manual.

Management and inventorying tool WuTility

Using the *Scan* function of *WuTility* the Web-IOs and Com-Servers contained 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 via 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 is only possible if the Web-IO does not yet currently have an IP address. The IP address which is to be assigned must be compatible with the address space of the local network.

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

Assignment via the serial interface

If the Web-IO 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 Web-IO please contact your system administrator and ask him to reserve a fixed IP address in the DHCP system for the Web-IO.

Additional information:

Manual for the [Web-IO](#)

[How do you prevent in DHCP environments Web-IOs from getting an unintended IP address?](#)

How does the Web-IO obtain 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 Web-IO 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 Web-based management

After the administrator logs onto the webpage of the Web-IO, all TCP/IP parameters in the area Config >> Device >> Basic settings >> Network can be entered and saved effortlessly in the corresponding fields.

Setting via the Telnet configuration menu

If the Web-IO 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 Web-IOs commencing from firmware version 1.39/205, 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 [Web-IO](#)

How do you assign a new IP address to a Web-IO 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 Web-IO.

Additional information:

Manual for the [Web-IO](#)

[How is the Web-IO assigned its IP address](#)

How many IP addresses does a Web-IO with additional serial Com-Server functionality require?

Only one! Whether the IOs or the serial interface are to be addressed is determined via the TCP port or the protocol (HTTP, TELNET, FTP, TCP port 8000,).

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 Web-IO does not currently have an IP address (see also [How do you assign a new IP address to a Web-IO 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 Web-IO already having an unknown address?](#)

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

1. Regardless of the serial transmission parameters set for normal operation, the Web-IO expects for entering the "x" characters (=ASCII 120) on boot-up *always* the transmission format 9600 baud, 8 data bits, no parity.
2. The terminal program used should be configured to "no Handshake" for assigning the IP address. Although the Web-IO 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.
3. The Web-IO 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 [Web-IO](#)

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

The Web-IO 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:

- for Web-IOs which are already operating, via web-based management using your browser
- serially by appending the characters "-0" behind the IP address.

Additional information:

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 Web-IO to its factory default settings?

1. The standard way of restoring the factory default settings is via Web-based management. After the administrator logs on, the Web-IO can do this via `Config >> Session Control >> Logout >> Factory Defaults`. In the process, the IP address is reset to 0.0.0.0 which enables a reassignment with the aid of the WuTility tool or of a static ARP entry.
2. In the case of Web-IO with serial Com-Server functionality, it is also possible via the Telnet configuration under the port number 1111. After selection of the relevant menu item in the "System setup" and then confirming with "Y", the Web-IO 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 the WuTility tool or a static ARP entry (see also Note)
3. If the current IP address of the Web-IO is not known or if it is not compatible to the specific network, the factory default settings can also be restored via the serial interface. To do this, after being reset, the "f" character must be sent to the Web-IO continuously for approximately 3 seconds. For this purpose, the serial interface is connected with a free COM interface on the PC. Independently of the serial transmission parameters set for normal operation, for the input of the "f" characters in the course of the boot process, the Web-IO *always* expects the transmission format 9600 baud, 8 data bits, no parity. For the assignment of the IP address, the terminal program being used should be configured to "No handshake". On starting, although the Web-IO sets its handshake outputs RTS and DTR to the enable state, serial cables which are not fully wired might otherwise cause problems. For the serial IP assignment, we recommend that our tool be used [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.

Note: For a possible check of whether the Web-IO 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 Web-IO takes 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 [Web-IO](#)

Why does the configuration menu of the Web-IO with serial Com-Server functionality not appear for a Telnet connection?

The Web-IO 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 Web-IO configuration is most quickly run from

"Start > Run..." using command line `telnet [IP address] 1111`.

Additional information:

Manual for the [Web-IO](#)

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

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

Why does the Web-IO with serial Com-Server functionality not output any data on the serial interface?

All Web-IOs with serial Com-Server functionality 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 [Web-IO](#)

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 Web-IOs be inventoried in the network?

WuTility

With the help of the free Com-Server and Web-IO 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.

SNMP

SNMP-based central management is frequently found particularly in large networks. All Web-IOs have an SNMP Agent which enables integration in these environments. In addition to the MIB-II, a Web-IO-specific MIB (private MIB) is also supported.

Additional information:

Manual for the [Web-IO](#)

Why after replacing a Web-IO 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 Web-IO 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 Web-IO.

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 Web-IO 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 Web-IO 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 Web-IO 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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