12 CO IP Interface 720003

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Use of the application program

Product family: System devices
Product type: IP-Interface
Manufacturer: Siemens

Name: IP Interface N148/22
Order-No.:   5WG1 148-1AB22

1. Functional description

The IP Interface is a DIN rail mounted device.

This device utilizes the KNXnet/IP standard and enables communication connections to KNX/EIB lines or systems via data networks using the Internet Protocol (IP). PC's or other data processing equipment can exchange data with KNX/EIB devices through this communication link.

The physical connection to the KNX/EIB bus is established via a bus connector terminal block. For connection to the data network (IP via 10BaseT) the device contains an RJ45 socket.

The IP Interface requires additional operating power for its operation.
The IP Interface N148/22 can source this operating power via the network connection from "Power over Ethernet" according to IEEE 802.3af. Alternatively, the operating power can be provided via a second terminal block (white-yellow terminals) by a safety extra low voltage (SELV) power supply AC/DC 24 V or by a bus power supply (unchoked power, DC 29V). When a SELV power supply is connected the operating power is sourced from it.

The IP Interface has these characteristics:

- Simple connection to hierarchically superimposed systems via Internet Protocol (IP)
- Direct access to the KNX/EIB installation from any access point to the IP network (KNXnet/IP Tunneling)
- Communication between buildings and facilities
- LED display of
  - operation
  - KNX/EIB communication
  - IP communication
- Simple configuration with standard ETS
- Easy connection to SCADA and Facility Management systems (see: Supported Software)

By using a LAN modem a KNX/EIB installation can be remotely accessed even if there is no direct data network connection between a PC and an IP Interface. LAN modems are available on the market for standard telephone, ISDN or DSL connections.

KNXnet/IP Tunneling interface to the bus
A direct connection between a networked PC and the bus can be established via a data network and the IP Interface N 148/22. This allows for accessing the bus from any access point in the data network.

The IP Interface N148/22 provides up to four KNXnet/IP Tunneling connections, allowing for e.g. simultaneous configuration with ETS and operation of a visualization.

Note

For stable communication via KNXnet/IP Tunneling the IP Interface must use a separate individual address for each KNXnet/IP Tunneling connection. These additional individual addresses must be different from the individual address of the device and must not be used by any other bus device. In ETS these individual addresses should be reserved by proxy devices.

ObjectServer interface to the bus (N148/22)
A direct connection between a networked PC and the bus can also be established via a data network and the IP Interface N148/22 using ObjectServer. ObjectServer compared with KNXnet/IP Tunneling provides the advantage that the communication can be maintained even over network connections with a transmission time for the datagrams of over one second (e.g. satellite connections).

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Assignment of additional individual address(es)

Additional individual addresses are either assigned with ETS (see: Setting the additional individual address of the IP Interface with ETS5) or alternatively without a tool automatically by the device itself.
The automatic address assignment for KNXnet/IP Tunneling and ObjectServer is started when the learning button is pressed during normal operation for more than 5 seconds but less than 10 seconds. The programming LED flashes during the address assignment process. The device checks which individual addresses are already used by other bus devices connected to the bus line. These addresses are not used for the address assignment.
By adding additional bus devices at a later time one or more of the additional individual addresses could be assigned twice. When during normal operation the learning button is pressed for more than 10 seconds all additional individual addresses in the IP Interface N148/22 are reset to the default value (15.15.255) and the programming LED is turned off.

Note

The automatically assigned additional individual addresses can be determined by scanning the line with ETS. Subsequently, these can be entered in ETS5.
The additional individual addresses can also be read with the Siemens KNXnet/IP Diagnostic Tool.

IP address assignment
Please consult your network administrator regarding configuration of the parameters device IP address, subnet mask, and DHCP.

The IP address of the IP Interface N148/22 is assigned manually using ETS, automatically by a DHCP server in the IP network, or by the device itself (AutoIP). Assignment of the IP address by a DHCP server allows for changes of the device IP address without using ETS. Configuration of the DHCP server may require the MAC address, which is printed on the device. If a DHCP server is not available the device assigns itself an IP address (AutoIP).

Default factory settings
The IP Interface ships with these default factory settings:
*   Physical address of the IP Interface:
    15.15.15 (= FFFF hex)
*   IP address assignment via DHCP

Note

The IP Interface can be reset to the default factory settings by pressing the learning button for more than six seconds when the operation voltage is turned on. The transition to the default state is indicated by a blinking programming LED. All parameter settings are deleted by this reset action.

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2. Communication objects

The application program has no communication objects. The application program already has been loaded in the factory.

The device is configured and commissioned with Engineering Tool Software (ETS) version ETS5 or higher.
With the ETS (Engineering Tool Software) the specific parameters are assigned appropriately, and downloaded into the device.
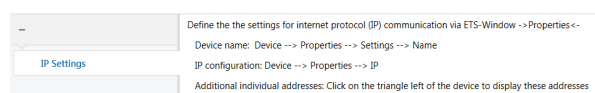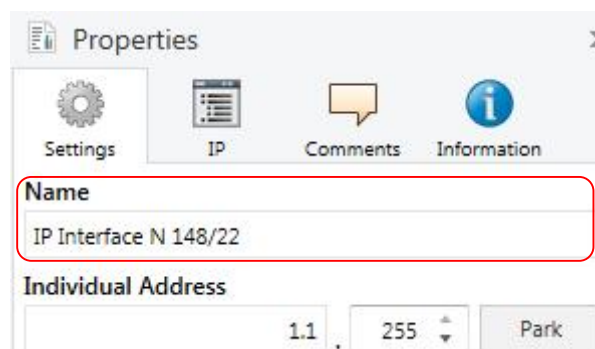
3. Parameters

Note

The settings printed in **bold** correspond to the factory settings (default values).

The application program „12 CO IP Interface 720003" has no specific parameters.

IP Settings

Device name

Parameter	Settings
Device name (max. 255 char)	IP Interface N148
This parameter determines the name (max. 255 characters) of the IP Interface, which is used for easy recognition of the device when searched by an KNXnet/IP visualisation or the ETS.	

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IP configuration

Parameter	Settings
IP Address Assignment	Obtain an IP address automatically
	Use a static IP address
This parameter determines the type of IP address assignment. By default the parameter is set for automatic assignment of the IP address by a DHCP server. If "Use a static IP address" is selected two additional tabs appear for manual input of the IP address, subnet mask, and the default gateway address.	

When „Use a static IP address" is selected then these additional parameters appear.

Parameter	Settings
IP Address	255.255.255.255
This parameter is only visible if manual input was chosen for IP Address Assignment. It determines the IP address of the IP Interface. The ETS default setting for the IP address is **255.255.255.255**. This setting must be replaced by a valid IP address. Each byte of the four byte IP Routing Multicast Address is set separately, with a value range of 0...255 for each byte.	
Subnet Mask	255.255.255.255
This parameter is only visible if manual input was chosen for IP Address Assignment. It determines the IP subnet mask used by the IP Interface. The ETS default setting for the IP subnet mask is **255.255.255.255**. This default value must be replaced by a valid subnet mask. Valid subnet mask values are e.g. 255.255.255.0 or 255.255.240.0.	
Default Gateway	255.255.255.255
This parameter is only visible if manual input was chosen for IP Address Assignment. It determines the IP address of the IP Default Gateway. The factory default value is **255.255.255.255**. This default value may be replaced by a valid IP address. Each byte of the four byte IP Default Gateway address is set separately, with a value range of 0...255 for each byte. The Standard Gateway transmits IP datagrams to IP devices with IP addresses outside of the local network. Use the invalid IP address (**0.0.0.0**) if the device shall be configured without a Standard Gateway.	

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4. Setting the additional individual address of the IP Interface with ETS5

For a stable communication with the IP Interface via KNXnet/IP Tunneling an additional individual address must be set using ETS5. View Example:
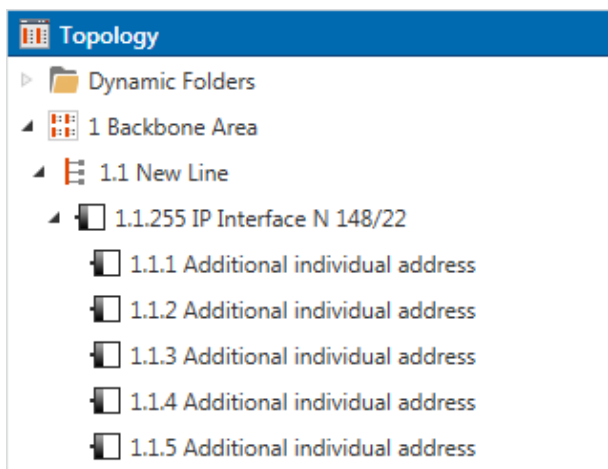
ETS automatically generates the additional individual addresses.

When an additional individual address is selected then it can be changed under Properties, Settings.
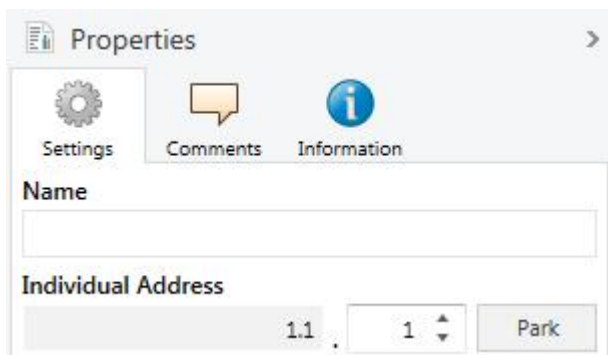
5. Notes on secured data transmission

This KNXnet/IP device is designed for operation in a network, which is only accessible by authorized users.

This device shall not be connected directly and unsecured with the Internet.

If Internet access to a KNX installation is needed, then a VPN connection to the Internet Router shall be implemented.

A Virtual Private Network (VPN) establishes an encrypted and authorized connection (VPN tunnel) from a remote point into a network via the Internet. This VPN connection allows secured and eaves-dropping protected communication between a remote device and the KNX installation. Administration of access rights to this KNXnet/IP device in an IP network shall be coordinated with the responsible IP network administrator.

Possible additional security measures are among others:
- Switches and routers are set in such a way that only known MAC addresses are able to access the communication medium.
- A separate IP network with own hardware is setup for KNX communication.
- Access to the (KNX) IP network is limited to authorized persons via appropriate user names and strong passwords.
- If WLAN is being used, the default SSID of the wireless access point is changed. The WLAN is encrypted with a secure (currently e.g. WPA2) method.
- Ports for incoming connections of routers, especially UDP port 3671 reserved for KNXnet/IP, are closed.

The network settings shall be documented and handed over to the building owner / operator or the LAN administrator.

For further information on KNX security refer to the KNX Secure Checklist
(https://www.knx.org/media/docs/downloads/Marketing/Flyers/KNX-Secure-Checklist/KNX-Secure-Checklist_en.pdf)
and the KNX Secure Position Paper
(https://www.knx.org/media/docs/downloads/Marketing/Flyers/KNX-Secure-Position-Paper/KNX-Secure-Position-Paper_en.pdf).

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