Application Note

FESTO

Information on analyzing a communication interruption between VAEM-V and a CODESYS controller

VAEM-V-S8EPRS2

Brief description of the analysis of a communication interruption via Ethernet TCP/IP or Modbus/TCP with a valve control module VAEM-V-S8EPRS2 and a note on deactivating the CODESYS Gateway Service in a network with the valve control module.

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1   Components/Software used

Typ/Name	Version Software/Firmware	Teilnummer
VAEM-V-S8EPRS2	1.2.3.0	8088772
CPX-E-CEC-C1	1.2.x.x	5226780
COSDESYS IDE	V3.5SP16 Patch 4	

Table 1.1:   Components/Software used

2   Note on establishing an Ethernet connection with VAEM-V-S8EPRS2

A communication protocol based on Modbus/TCP with function code 23 is used to connect via Ethernet to a valve control module.

The VAEM-V-S8EPRS2 valve control module does not have a real-time communication interface. If commands or Ethernet packets are sent to the VAEM-V via this interface with too fast transmission interval (burst-like), communication can be interrupted.

Therefore, the time interval between two commands that are sent to the control module must ***be longer than 1 millisecond.***

This condition must be observed not only for sending the data packets via TCP/IP but also via UDP (e.g. broadcasts).

3 Example of a connection failure and corrective action

3.1 Network topology
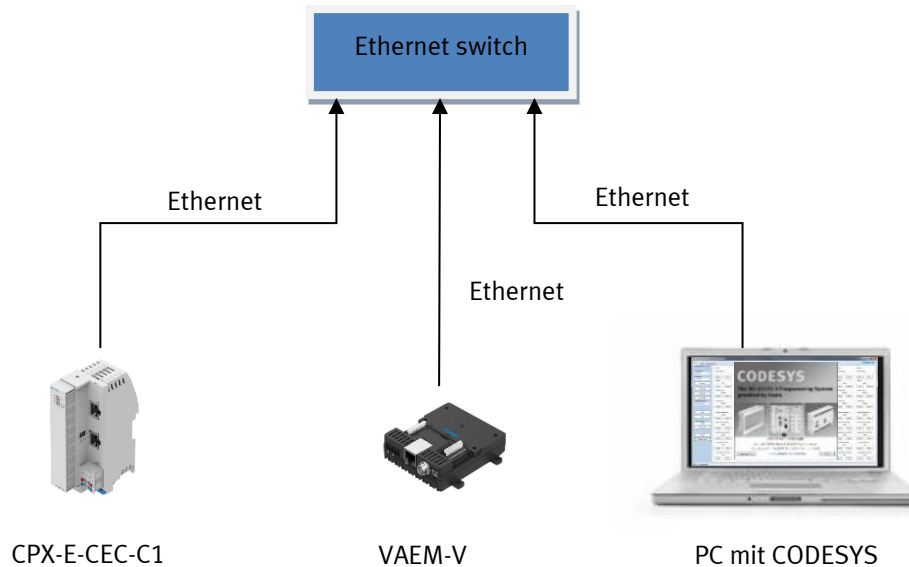
3.2 Network disruption

The PC on which the CODESYS development environment (version 3.5 SP16) is running sends the UDP commands from the CODESYS Gateway Service to the valve control module at very short intervals (microseconds)..

| Time Stamp(s)	Source	Destination	Protocol		
2831 14.807326	192.168.4.100	192.168.255.255	UDP	60	1743 → 1740 Len=12
2832 14.807327	192.168.4.100	192.168.255.255	UDP	60	1743 → 1741 Len=12
2833 14.807327	192.168.4.100	192.168.255.255	UDP	60	1743 → 1742 Len=12
2834 14.807327	192.168.4.100	192.168.255.255	UDP	60	1743 → 1743 Len=12
2835 14.815091	192.168.10.2	192.168.10.106	Modbus…	85	Query: Trans: 15633; Unit: 255,

In the Windows Task Manager you can check whether the CODESYS Gateway Service program is running.
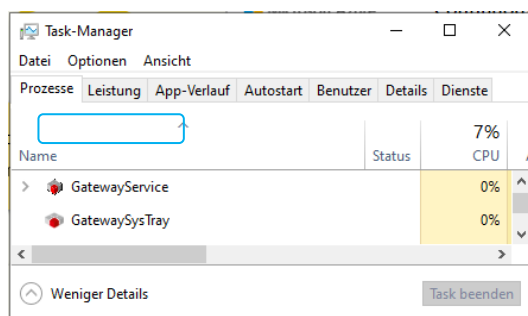
The following note on deactivating the gateway service is unnecessary for the CODESYS development environment from version 3.5 SP18.

3.3   Deactivating the Gateway Service

To avoid a communication problem with a VAEM-V valve control module, the CODESYS Gateway Service program should be deactivated:
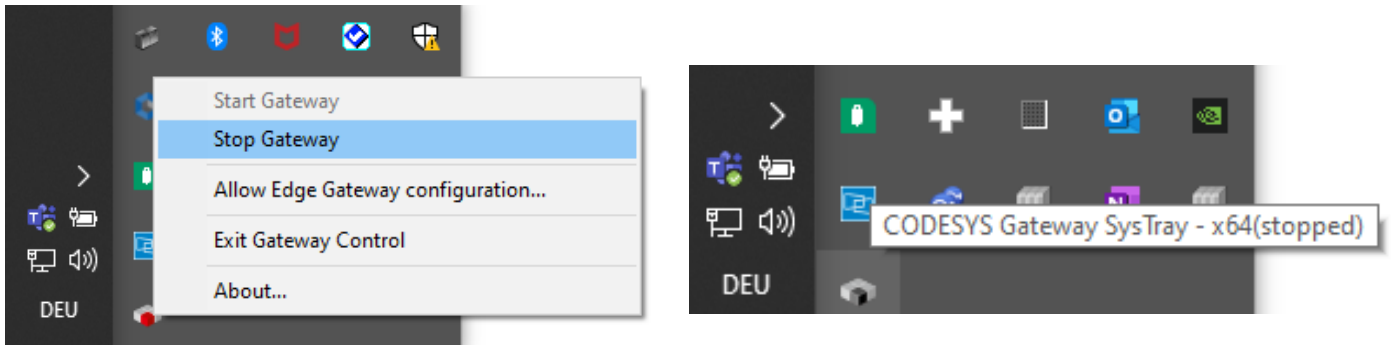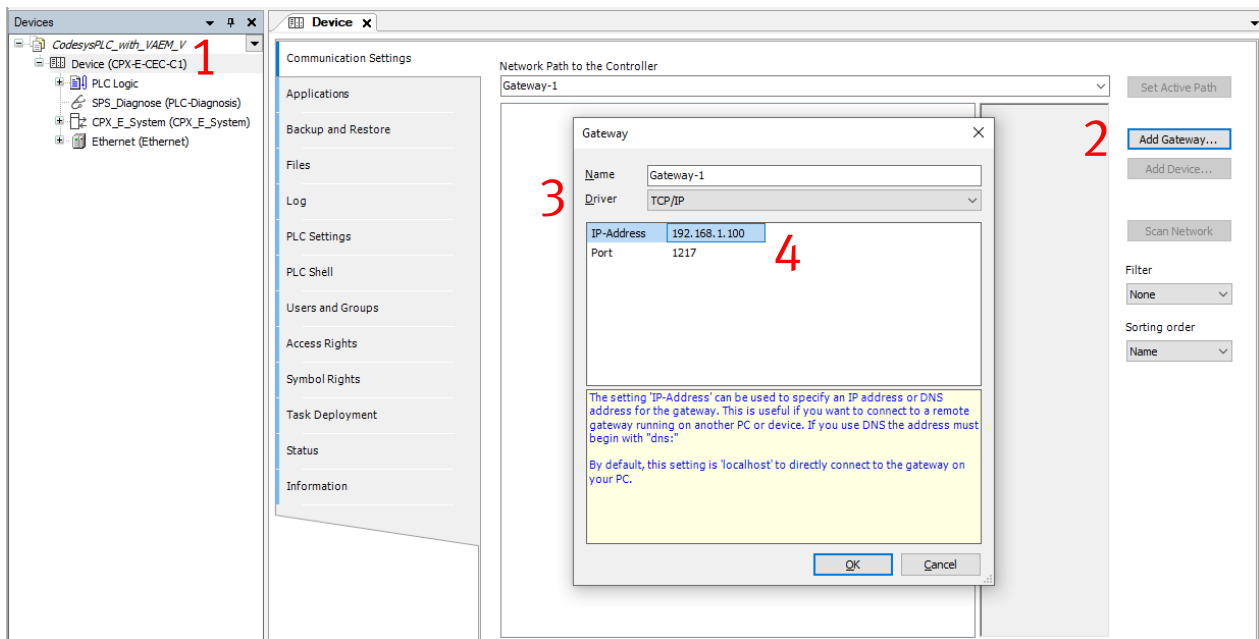

To download a CODESYS program after deactivating the CODESYS Gateway Service the CODESYS development environment uses a TCP/IP gateway.

You can connect with the following steps:

- The connection setup is described in the "classic" layout. This can be set via Tools/Options/ Device Editor.
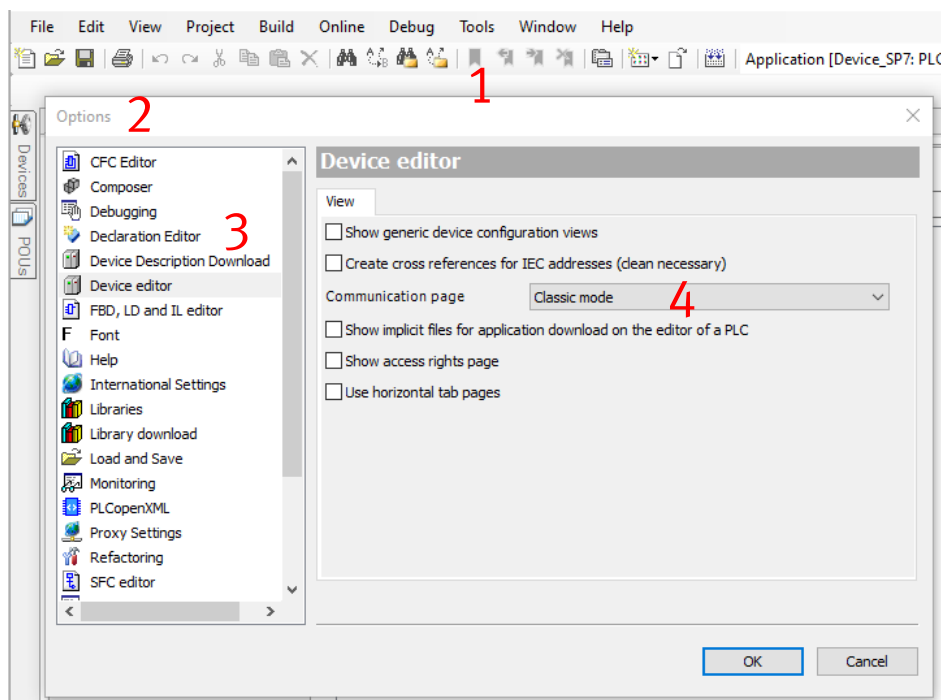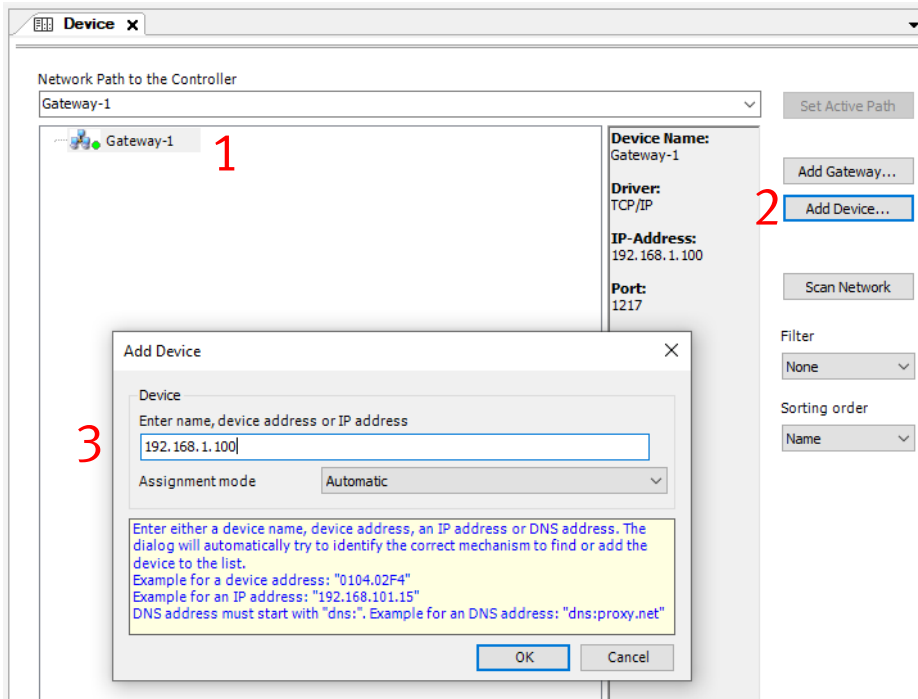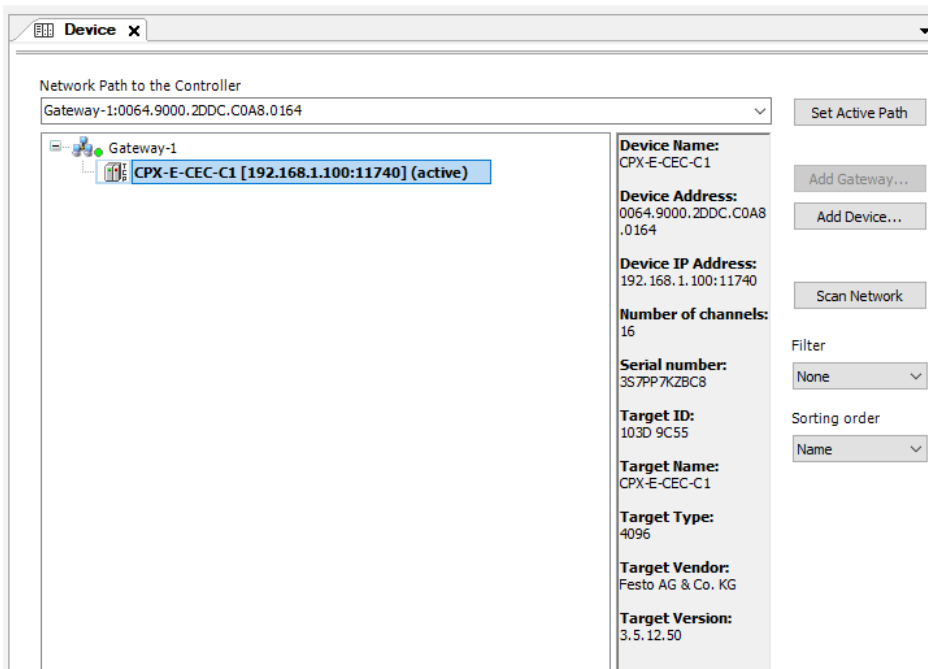
- Add a new gateway on the Device page.

- Select TCP/IP under "Driver" and enter the IP address of the controller for the gateway. The controller and the PC must be in an IP network (e.g. with subnet mask 255:255:255:0 | PC 192.168.1.99 | SPS 192.168.1.100).

- Select the created "Gateway" and add the controller.

- Double click on the controller to activate a connection with the controller.

- Then CODESYS programs can be loaded onto the controller (without gateway service) as usual. The burst-like broadcasts caused by the gateway service are thus eliminated and no longer lead to a connection abort between the VAEM-V and the controller.