

## USER GUIDE

### CANopen Tunnel

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**CANopen**

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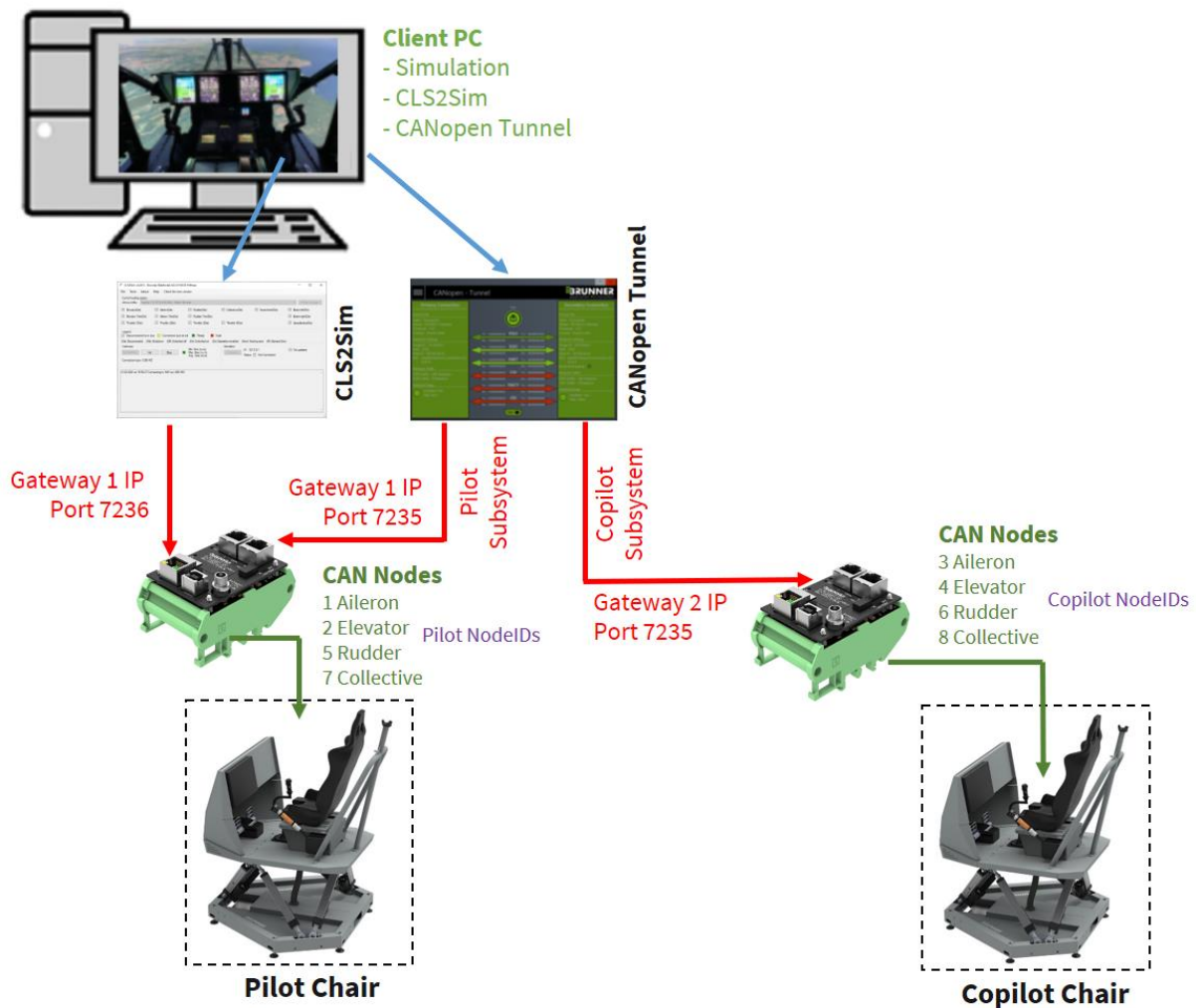
## 1. Overview

The *CANopen Tunnel* allows to connect two separate CAN buses over Ethernet. For that purpose, it has to interface to an Ethernet-to-CAN gateway on either side of the system.

### 1.1 CLS2Sim Pilot/Copilot Setup

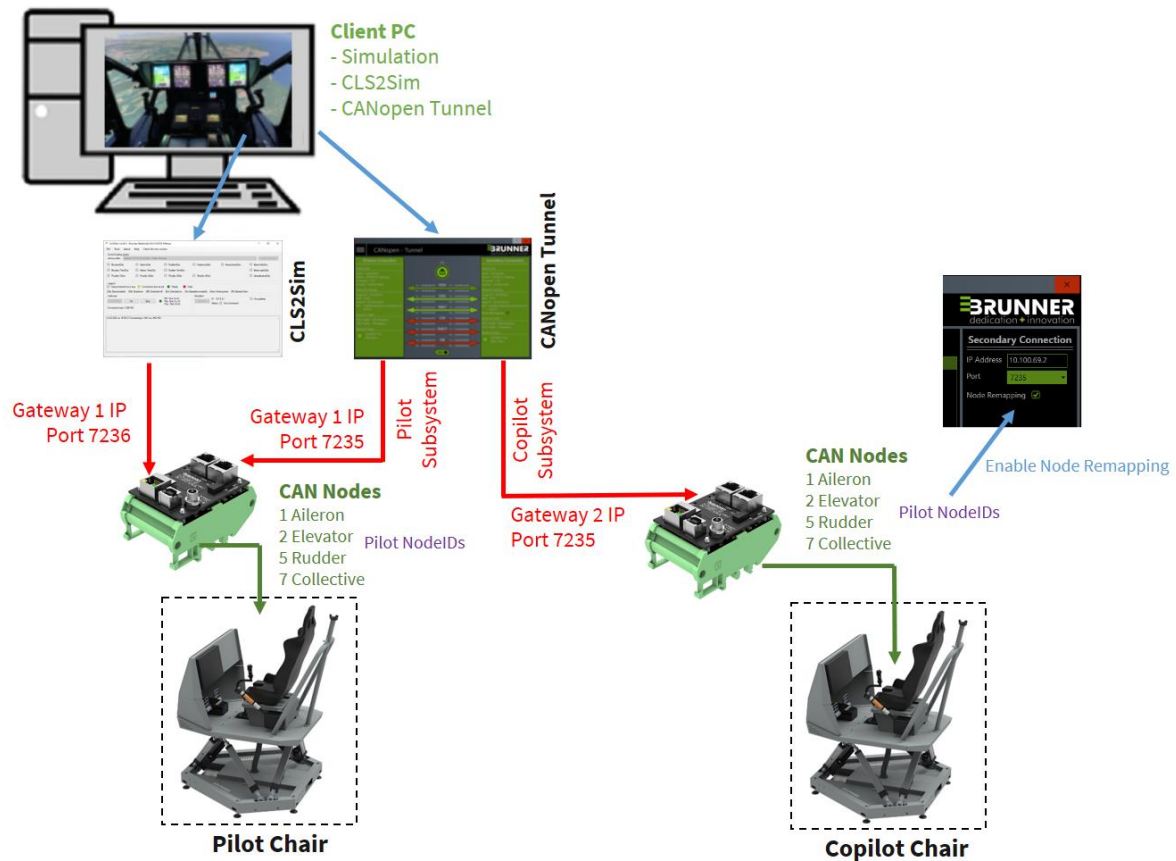
A major use case is to connect *CLS2Sim* to *Brunner CLS* devices in a Pilot/Copilot setup:

- CAN bus 1 connects the Pilot subsystem and can be accessed over Gateway 1
- CAN bus 2 connects the Copilot subsystem and can be accessed over Gateway 2
- *CANopen Tunnel* connects to Gateway 1 over the primary connection, and to Gateway 2 over the secondary connection
- *CLS2Sim* (CAN master) connects to Gateway 1 and allows to interface all CAN devices to the Simulation
- In the default configuration *CANopen Tunnel* uses TCP port 7235, while *CLS2Sim* uses port 7236

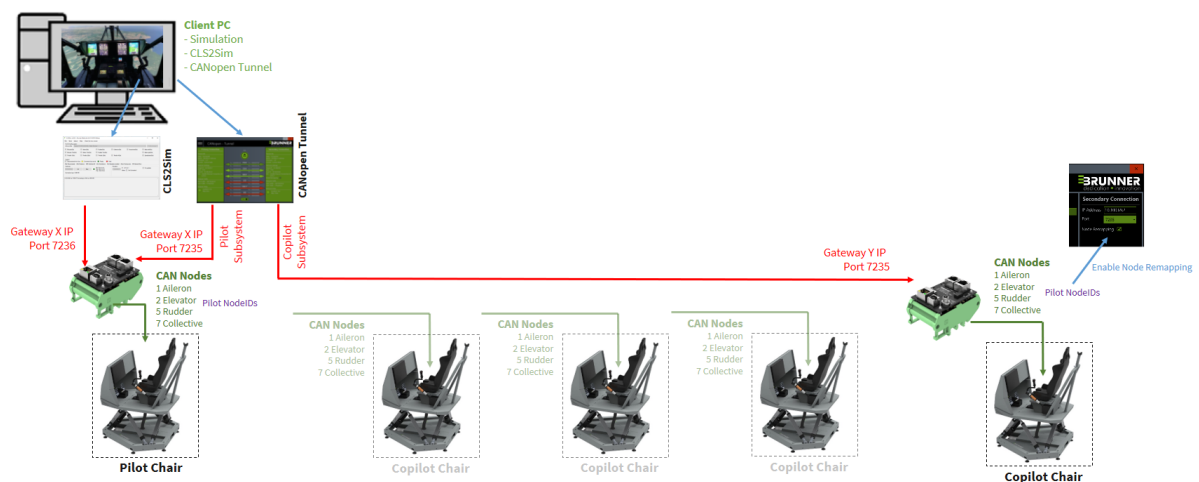


## 1.2 CLS2Sim Pilot/Copilot Setup with Node Remapping

This setup is very similar to the previous one, except that the Copilot subsystem contains CANopen devices with Pilot NodeIDs. In this configuration the “Node Remapping” feature has to be enabled on the secondary connection, which allows Pilot NodeIDs to be remapped as Copilot NodeIDs.



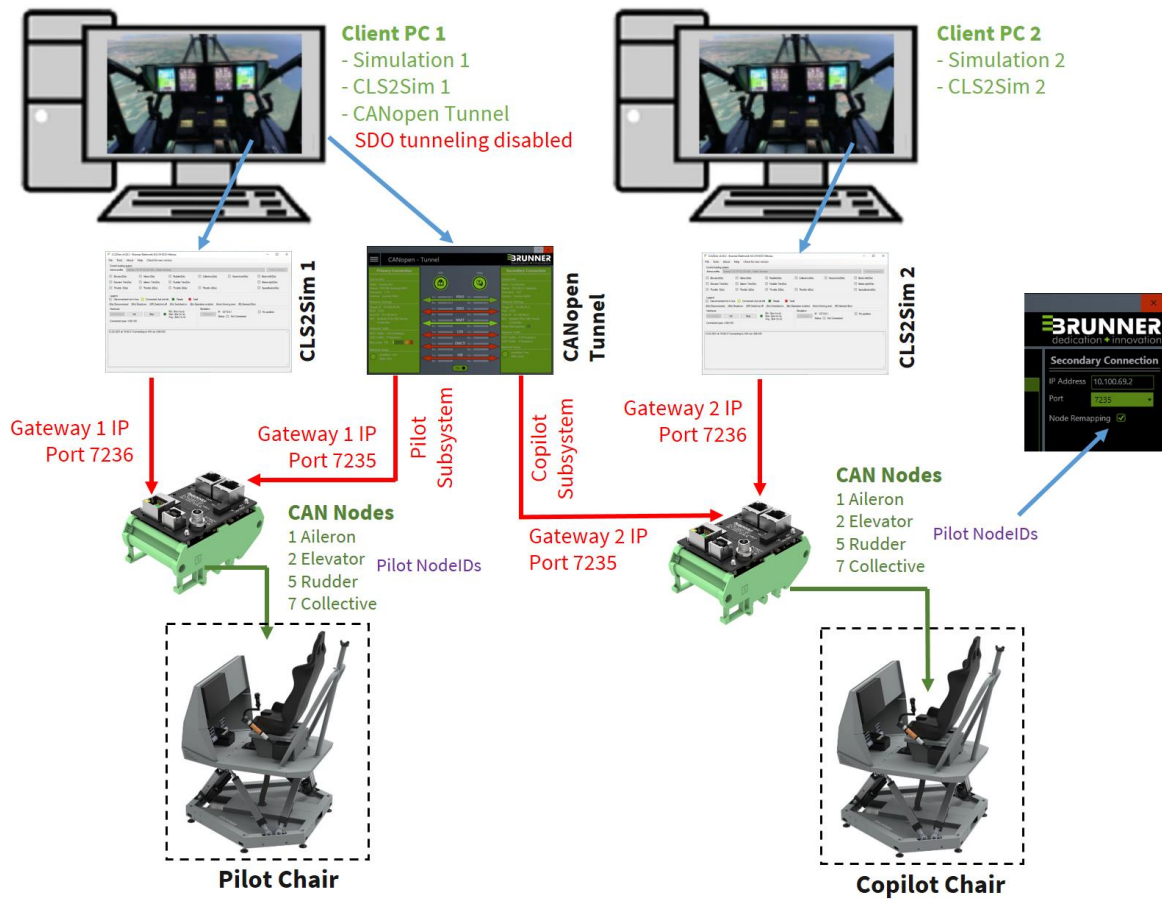
The main advantage of this setup is that each CAN subsystem can be selected as Pilot or Copilot, with minimal configuration effort, making it very flexible. A subsystem can be exchanged for another at any time.



### 1.3 Dual CLS2Sim Setup

The dual *CLS2Sim* setup features two separate client PCs, each running a simulation software:

- CAN bus 1 connects the Pilot subsystem and can be accessed over Gateway 1
- CAN bus 2 connects the Copilot subsystem and can be accessed over Gateway 2
- *CANopen Tunnel* connects to Gateway 1 over the primary connection, and to Gateway 2 over the secondary connection
- The *CANopen Tunnel* must disable SDO message tunneling, so that the two CAN masters cannot interfere with each other (see chapter 2.2)
- *CLS2Sim 1* (CAN master 1) connects to Gateway 1 and allows to interface the Pilot CAN devices to the Simulation 1
- *CLS2Sim 2* (CAN master 2) connects to Gateway 2 and allows to interface the Copilot CAN devices to the Simulation 2
- In the default configuration *CANopen Tunnel* uses TCP port 7235, while *CLS2Sim* uses port 7236

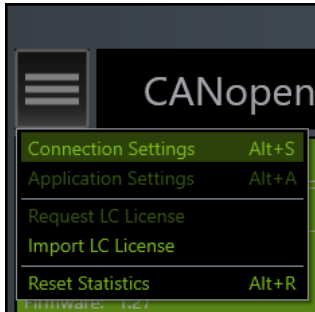


This setup works with and without “Node Remapping”. The same rules apply regarding CANopen NodeIDs.

## 2. Configuration

### 2.1 Connection Settings

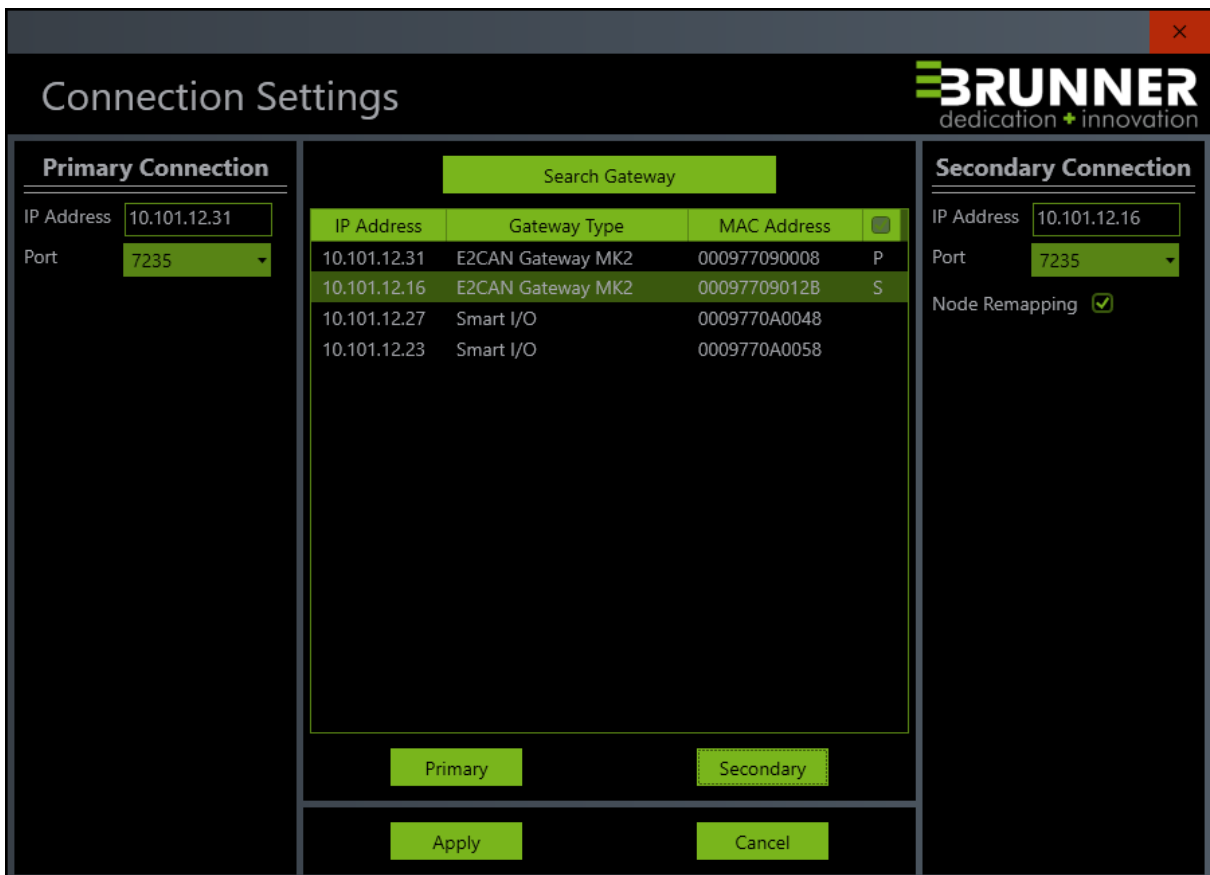
The Connection Settings can be accessed from the navigation bar in the upper left corner, or by pressing the ALT+S hotkey.



#### 2.1.1 IP Address

Press “Search Gateway” to scan for all available *Brunner Elektronik* gateway devices. The results will be listed below.

Select a gateway from the list and press “Primary” to assign the selected gateway as primary connection. Similarly, after selecting another gateway, press the “Secondary” button to configure the secondary connection.



### 2.1.2 Port

The available ports are 7235 and 7236. Unless otherwise specified, the port should be left at the default value “7235”.

### 2.1.3 Node Remapping

The “Node Remapping” feature is available for the secondary connection. This helps to simplify the hardware setup of the Copilot subsystem. The CANopen NodeIDs are kept the same as for the Pilot subsystem, and *CANopen Tunnel* remaps the NodeIDs accordingly.

The *CANopen Tunnel* will remap secondary connection Pilot NodeIDs to Copilot NodeIDs as follows:

CLS Device	Pilot NodeID	Copilot NodeID
Aileron	1	3
Elevator	2	4
Rudder	5	6
Collective	7	8
I/O	25	35
I/O	26	36
I/O	27	37
I/O	28	38
I/O	29	39

Important: While “Node Remapping” is enabled, Pilot NodeIDs won’t be tunneled from the primary to the secondary connection, and Copilot NodeIDs won’t be tunneled from the secondary to the primary connection.

When “Node Remapping” is activated, the Master (e.g. *CLS2Sim*) should only be connected to the primary connection. Unless the system has a dual Master setup.

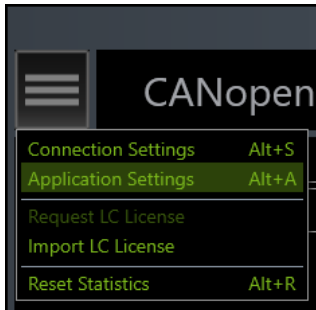
### 2.1.4 Apply Settings

Hit “Apply” to accept the selected settings, and “Cancel” to discard the settings.

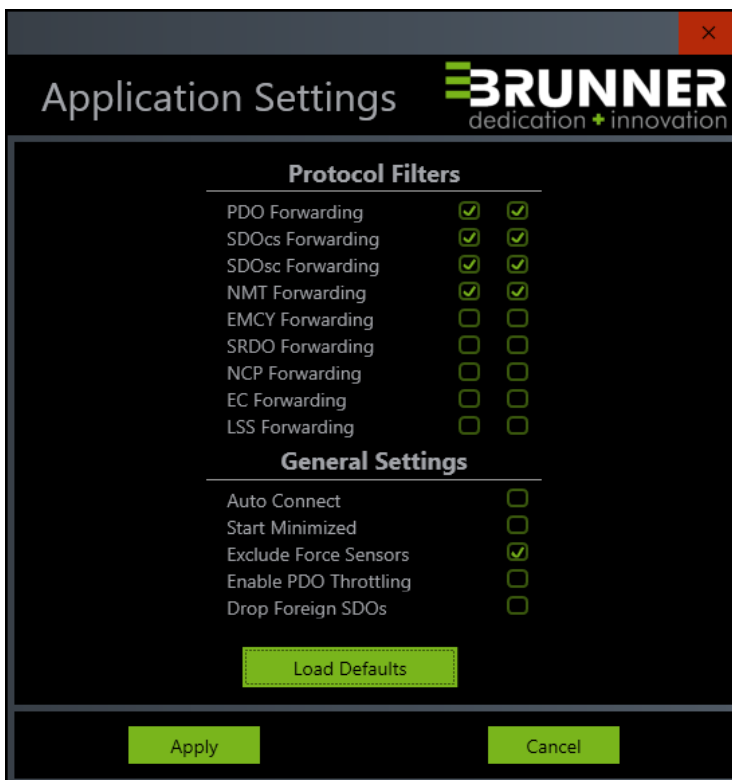


## 2.2 Application Settings

The Application Settings can be accessed from the navigation bar in the upper left corner, or by pressing the ALT+A hotkey.



The application settings can only be changed when the application is disconnected from the gateways.



Press “Load Defaults” to set the default application settings.

Hit “Apply” to accept the selected settings, and “Cancel” to discard the settings.



### 2.2.1 CANopen Protocol Filters

The CANopen protocol filters can be configured using the appropriate checkboxes. If enabled the corresponding CAN-ID ranges will be tunneled.

Protocol Filters		
PDO Forwarding	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SDOcs Forwarding	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SDOsc Forwarding	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
NMT Forwarding	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
EMCY Forwarding	<input type="checkbox"/>	<input type="checkbox"/>
SRDO Forwarding	<input type="checkbox"/>	<input type="checkbox"/>
NCP Forwarding	<input type="checkbox"/>	<input type="checkbox"/>
EC Forwarding	<input type="checkbox"/>	<input type="checkbox"/>
LSS Forwarding	<input type="checkbox"/>	<input type="checkbox"/>

Protocol Filters:

Protocol Filter	CAN-ID Range
PDO Forwarding	0x180 ... 0x57F
SDOcs Forwarding	0x600 ... 0x67F
SDOsc Forwarding	0x580 ... 0x5FF
NMT Forwarding	0x000 ... 0x07F
EMCY Forwarding	0x080 ... 0x0FF
SRDO Forwarding	0x100 ... 0x17F
NCP Forwarding	0x680 ... 0x6FF
EC Forwarding	0x700 ... 0x77F
LSS Forwarding	0x780 ... 0x7FF

The protocols filters can be set individually for the Primary (left checkbox) and Secondary Connection (right checkbox).

### 2.2.2 Auto Connect

When the “Auto Connect” option is enabled, the application will automatically attempt to connect during startup.

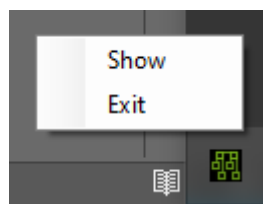


### 2.2.3 Start Minimized

With the “Start Minimized” feature enabled, the application will start minimized to the system tray. This is usually used in conjunction with the “Auto Connect” option.

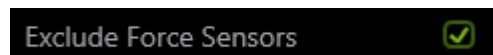


To open up the application, right click on the system tray icon and select “Show”, or double click the system tray icon.



### 2.2.4 Exclude Force Sensors

Enabling this setting prevents the force sensors in Brunner CLS devices from being tunneled, reducing the overall load on the CAN bus. This applies to node IDs 20-24, 30-34, 40-44, and 60-64.



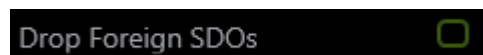
### 2.2.5 Enable PDO Throttling

With the “Enable PDO Throttling” feature enabled, the tunnel will drop every second PDO of a specific COB-ID when the CAN bus load on either side exceeds 50%.



### 2.2.6 Drop Foreign SDOs

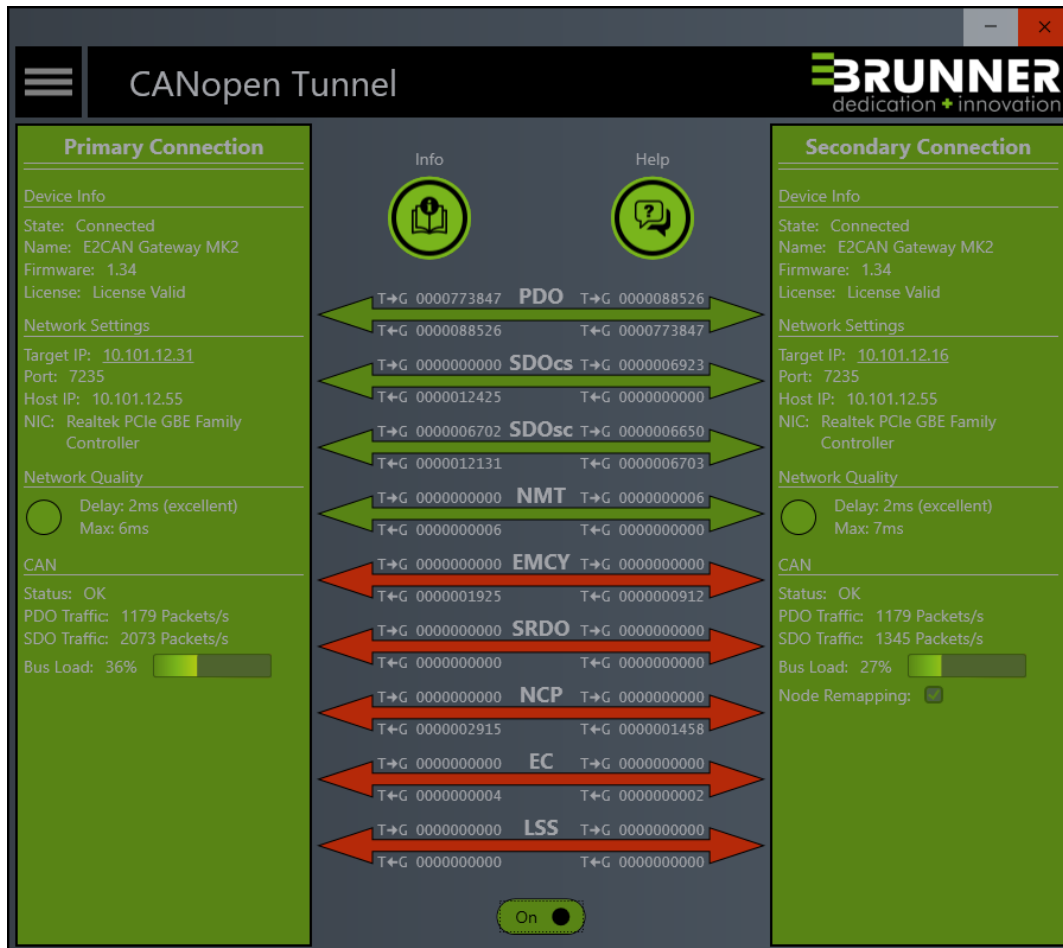
Upon startup, the CANopen Tunnel scans all visible nodes on both connections. When this feature is enabled, the Tunnel will filter out foreign SDO messages from the secondary connection, minimizing unnecessary communication on the second gateway. This helps to reduce CAN bus load and improve overall performance.



When this feature is enabled, the Master (e.g. *CLS2Sim*) should only be connected to the primary connection.

### 3. CANopen Tunneling

Press the “ON/OFF” toggle button on the bottom center (or ALT+C) to attempt to connect to the two gateways. If successful, the background will turn green and the connection state will show “Connected”.



#### 3.1 Connection Info

##### Device Info

- State: connection state
  - o Disconnected: no active connection
  - o Connecting: attempting to connect to the gateway
  - o Connected: connection successfully established
  - o Error: an error occurred; see below for more details
- Name: name of the gateway device
- Firmware: gateway firmware version
- License: license state
  - o License Valid: gateway has a valid *CANopen Tunnel* license
  - o License Invalid: gateway isn't licensed

#### Network Settings

- Target IP: IP of the gateway
  - o The IP is a clickable link to the web interface of the gateway
- Port: Gateway port
- Host IP: IP of the host computer
- NIC: name of the host network interface controller

#### Network Delay:

- Connection delay between *CANopen Tunnel* and gateway
- Max: maximum connection delay

#### CAN:

- Status: CAN Status Register
  - o The CAN Status Register is described in detail further below
- PDO Traffic: number of PDO messages per second
- SDO Traffic: number of SDO messages per second
- Bus Load: the CAN bus load
  - o This information isn't available for the "E2CAN LC Gateway" device

#### 3.1.1 Connection State: Connected

Both gateways need to be successfully connected in order for the *CANopen Tunnel* to operate. If one connection is faulty, the other gateway will automatically be disconnected.

##### Device Info

State: Connected  
Name: E2CAN Gateway MK2  
Firmware: 1.10  
License: License Valid

#### 3.1.2 Connection State: Error

If a connection error occurs, the specific error will be displayed below.

##### Device Info

State: Error  
Firmware: N/A

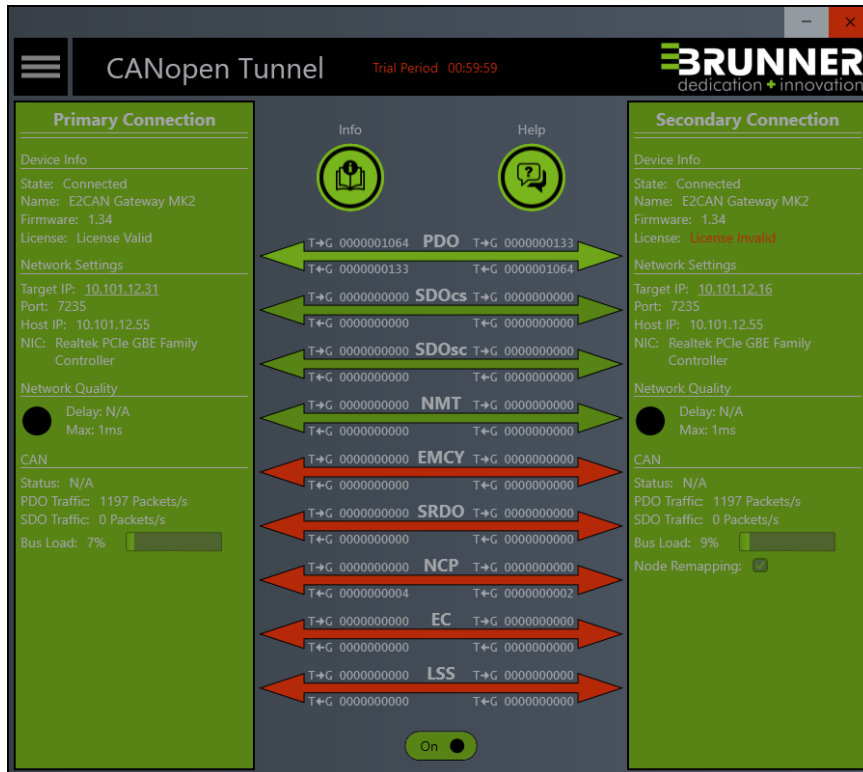
##### Error

Error: Port blocked

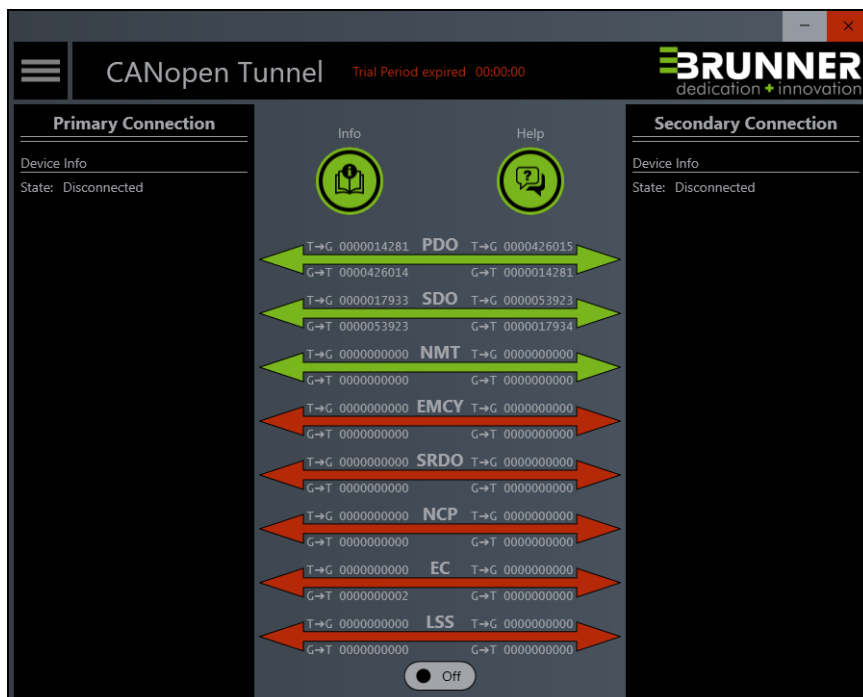
See the *Troubleshooting* section for further details.

### 3.1.3 CANopen Tunnel License

In order to use the *CANopen Tunnel* without restrictions, both gateways need to have a valid *Tunnel* license. If the license is missing on either or both gateways, the *CANopen Tunnel* will run in trial mode. The trial mode allows full operation for 60 minutes, after which the gateways will automatically disconnect.

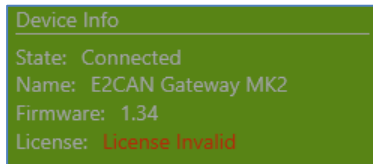


Trial period expired:



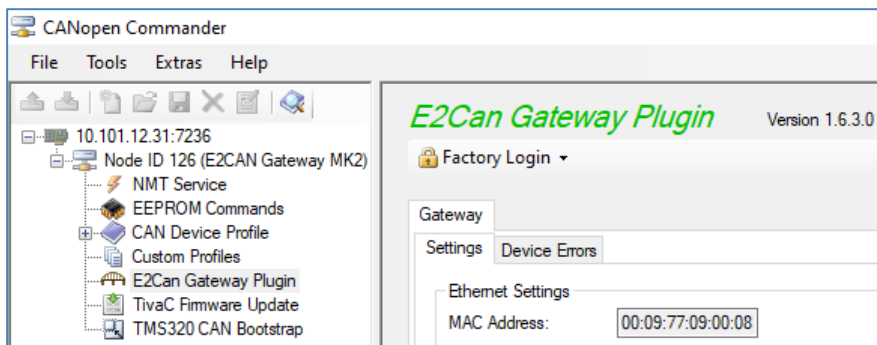
### 3.1.4 E2CAN Gateway MK2 – CANopen Tunnel License

The *CANopen Tunnel* license for the *E2CAN Gateway MK2* is managed on the device.



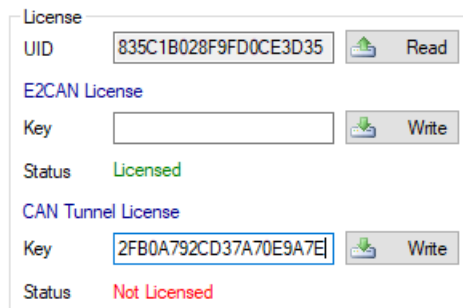
You have to use *CANopen Commander* in order to license the gateway.

Connect the device and select the “E2Can Gateway Plugin”.

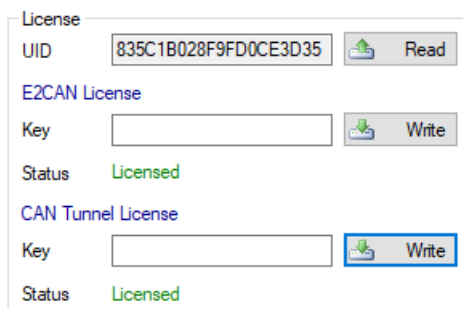


Obtain the license UID and send it along with the CANopen Tunnel License request to *Brunner Elektronik* at [support@brunner-innovation.swiss](mailto:support@brunner-innovation.swiss).

*Brunner Elektronik* will send you the license key, which you’ll have to apply. Copy the license key into the CAN Tunnel License Key field.



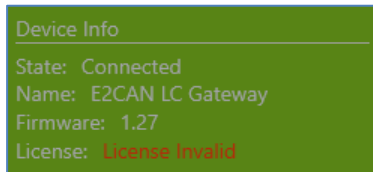
Write license.



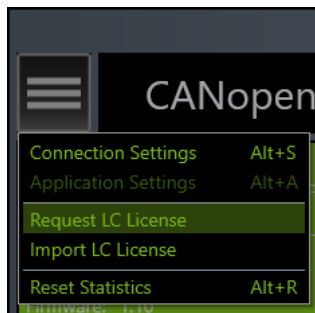
The Status should now show “Licensed”.

### 3.1.5 E2CAN LC Gateway – CANopen Tunnel License

The *CANopen Tunnel* license of the *E2CAN LC Gateway* is managed using a license file.

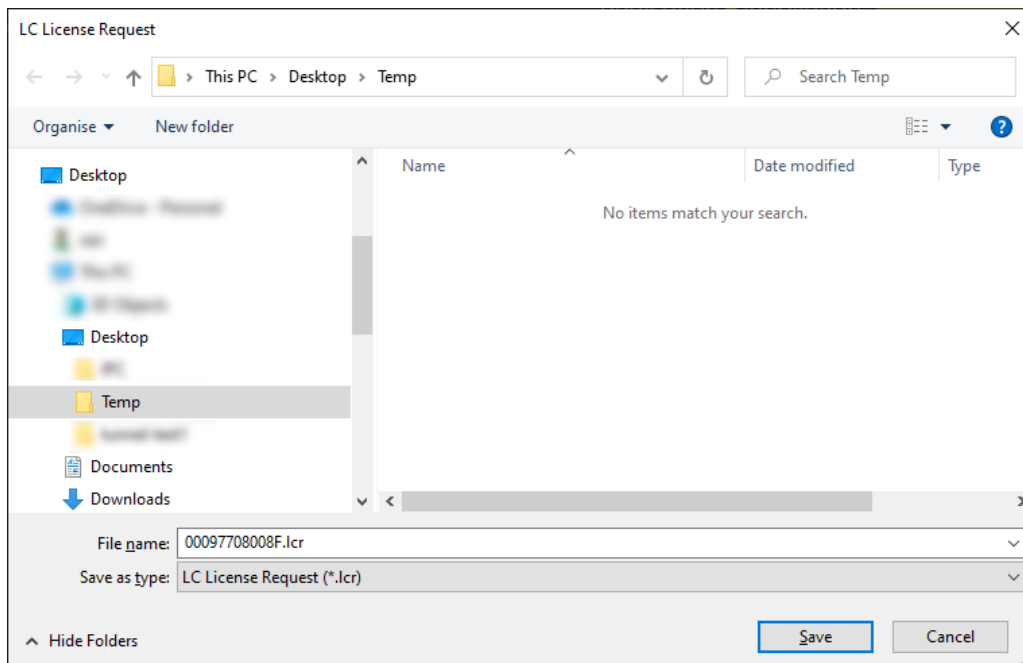


If the *E2CAN LC Gateway* doesn't have a valid *Tunnel* license, it can be requested from the navigation bar in the upper left corner. Select "Request LC License".



This option is only available if a connected *E2CAN LC Gateway* has an invalid *Tunnel* license.

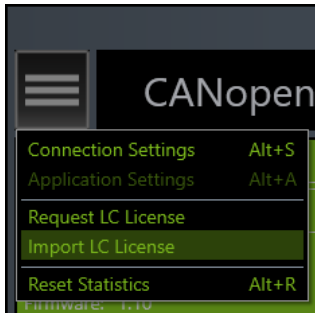
After selecting this option, you need to specify where the license request will be stored.



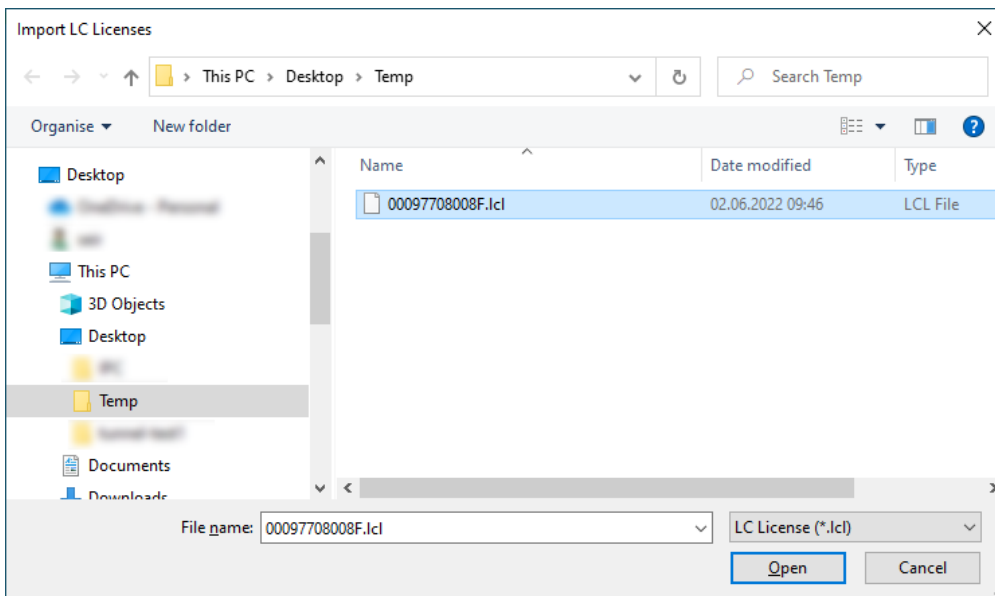
Please send this file *Brunner Elektronik* at [support@brunner-innovation.swiss](mailto:support@brunner-innovation.swiss) to request an *LC License* file.



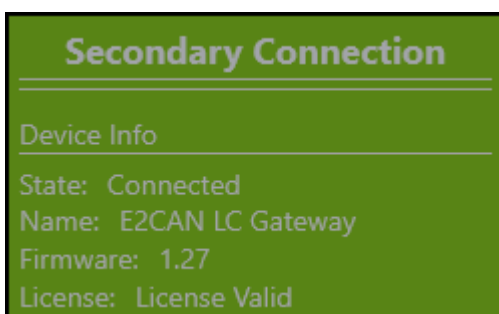
In response, *Brunner Elektronik* will send you a license file. To install this license, you need to head to the navigation bar and select “Import LC License”.



Navigate to the file’s location and press “Open”.

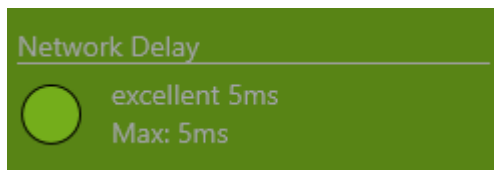


In order to activate this license, you only need to restart the connection.

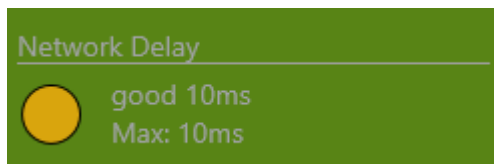


### 3.1.6 Network Delay

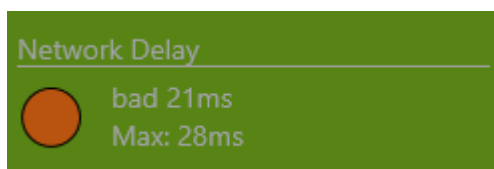
A network delay up to 5ms is considered excellent.



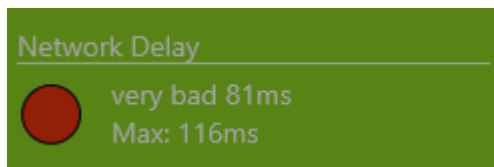
A network delay from 6ms up to 15ms is considered good.



A network delay from 16ms up to 30ms is considered bad.



A network delay from 31ms up to 100ms is considered very bad.



A network delay above 100ms is critical. The connection will be dropped if it stays in this critical range. However, if the network recovers from this state, the *CANopen Tunnel* will continue to operate normally.

### 3.1.7 CAN Status Register

This indicates the overall status of the CAN controller. The CAN status is derived from the CAN receive error counter (REC) and CAN transmit error counter (TEC).

*CAN Status: Bus OFF*



TEC exceeded 255. The CAN controller disconnects itself from the CAN bus, resulting in no CAN communication at all.

*CAN Status: Error Passive*



Any one of the error counters (REC, TEC) exceeded 127. The CAN transmitter is disabled.

### CAN Status: Warning

CAN
Status: Warning

Any one of the error counters has reached or exceeded 96. The CAN controller is still in active state.


### CAN Status: OK

CAN
Status: OK

Both error counters are below 96. The CAN controller is in active state.

### Web Interface: CAN Status Details

For more detailed information, click on the IP link to open up the web interface and select the “CAN Interface” page.



## E2CAN Gateway MK2

- General
- Info
- CAN
- CAN Interface**
- CAN Channel
- USB
- USB Interface
- USB Channel
- Ethernet
- Ethernet Interface
- Ethernet CANnet
- Ethernet Memory
- Ethernet Channel 1
- Ethernet Channel 2
- Ethernet Channel 3
- Ethernet Settings

### CAN Interface


Status	
Node ID	126
Baudrate [kbps]	1000
SDO Inhibit Time [ms]	5
PDO Acceptance Filter 31-0	0xFFFFFFFF
PDO Acceptance Filter 63-32	0xFFFFFFFF
PDO Acceptance Filter 95-64	0xFFFFFFFF
PDO Acceptance Filter 127-96	0xFFFFFFFF

Error Status	
REC	0
TEC	0
STATUS	Rx OK
BOFF	<input type="checkbox"/>
EPASS	<input type="checkbox"/>
EWARN	<input type="checkbox"/>

Statistics	
BOFF Counter	0
EPASS Counter	0
EWARN Counter	0
Stuff Errors	0

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E2CAN LC Gateway has a different web interface.



## E2CAN Gateway

### Product Info

Device Type	GER1088
Firmware Type	PRG1074
Firmware Version	1.27
USB VID/PID	0x25bb/0x0069
MAC Address	00:09:77:08:00:8f
S/N	1518919
License State	licensed

### Device Status

Ethernet Service Port 7235	connected
Ethernet Sniffer Port 7236	connected
Ethernet: Tx, Rx	15114568, 12524050
ARP: Tx, Rx, Ign	1, 1, 170
ICMP: Tx, Rx	0, 0
UDP unicast: Tx, Rx	0, 0
UDP broadcast: Tx, Rx, Ign	3, 4, 1254
TCP: Tx, Rx	15114564, 12514774
IP Drop: Vers, Proto, Foreign, Malf, Fragn, Crc	0, 0, 3587, 0, 0, 0
TCP Tx: Dat, Ack, Rst, ReTx, ReTxAck	13630651, 1483905, 0, 0, 0
TCP Rx: Dat, Ack, Rst, BsySyn, Malf, FReTxRq, SqEr	9332011, 3182746, 1, 0, 0, 0, 0
TCP Drop: Port, Busy, Crc	0, 0, 0
TCP: Fin, Rst, TxWin	0x0000, 0x0000, 0, 0
USB Connection	connected
USB: Tx, Rx	1, 0
USB Events: Con, Dis, Rsm, Susp, Ign, Err	1, 0, 0, 2, 0, 0
CAN State: TEC, REC, STS	0, 0, 0x18 (RXOK TXOK)
CAN Baudrate [kBit/s]	1000
CAN: Tx, Rx, Ign, Kick, BOFF	9445790, 7776899, 0, 2782, 0
CAN Pkg/s: Tx, Rx, Ign	1238, 1038, 0
CAN Buf Ovf: Tx, Rx0, Rx1, RxUsb	3056, 0, 0, 17222177
CAN Buf Usage: Tx, Rx0, Rx1, RxUsb, FifoLvl	512/512, 8/512, 10/512, 512/512, 3
CAN IRQ: None, Tx, Rx, Sts, Unsup	8335148, 9411378, 7776802, 11894, 0
Uptime [s]	21302.340
Visible Nodes	1 2 3 4
SDOs/Node: Tx, Tx-Rx	2047410, +3 4125221, +28360 26, +1 26, +1
PDO Allow Filter: Node 127..0	ffffff fffffff fffffff fffffff

Read

Clear Statistics

Bus Scan

### Active Ethernet Settings

State	IP Address assigned by DHCP
IP Address	10.101.12.14
Subnet Mask	255.255.252.0
Default Gateway	10.101.12.1

### Ethernet Configuration

Static IP Address	<input type="text" value="10.100.69.11"/>
Subnet Mask	<input type="text" value="255.255.0.0"/>
Default Gateway	<input type="text" value="10.100.0.1"/>
DHCP Enable	<input checked="" type="checkbox"/>

Apply Settings

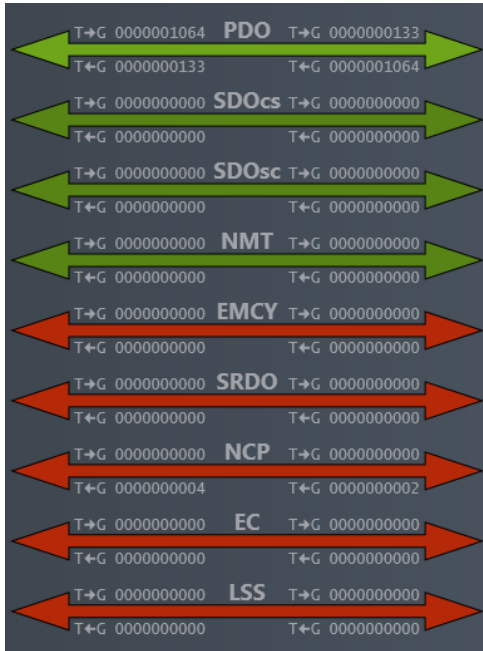
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<https://brunner-innovation.swiss>

### 3.2 Tunnel Info

The center of the screen displays tunneling status info.

A green arrow indicates that the corresponding CANopen protocol will be tunneled from the primary to the secondary connection, and vice versa. A red arrow means that the CANopen protocol won't be tunneled.

In the example below PDO, SDO and NMT messages will be tunneled, while EMCY, SRDO, NCP, EC and LSS messages will be dropped.



Protocol Specifier:

Specifier	Protocol	Function Code	CAN-ID Range
PDO	Process Data Object	3 ... 10	0x180 ... 0x57F
SDOcs	Service Data Object, Client-to-Server	12	0x600 ... 0x67F
SDOsc	Service Data Object, Server-to-Client	11	0x580 ... 0x58F
NMT	Network Management Global Failsafe Command Flying Master Indicate Active Interface	0	0x000 ... 0x07F
EMCY	Synchronization Object Emergency Object	1	0x080 ... 0x0FF
SRDO	Time Stamp Safety-Relevant Data Object	2	0x100 ... 0x17F
NCP	Dynamic SDO Request Node Claiming Procedure	13	0x680 ... 0x6FF
EC	NMT Error Control Protocols: Heartbeat, Node Guarding	14	0x700 ... 0x77F
LSS	Layer Service Settings	15	0x780 ... 0x7FF

Protocol statistics are displayed for each CANopen protocol individually:

- Left **T→G**: messages transmitted from the *CANopen Tunnel* (T) to the primary connection gateway (G)
- Left **T←G**: messages transmitted from the primary connection gateway (G) to the *CANopen Tunnel* (T)
- Right **T→G**: messages transmitted from the *CANopen Tunnel* (T) to the secondary connection gateway (G)
- Right **T←G**: messages transmitted from the secondary connection gateway to the *CANopen Tunnel* (T)



Important: If the 'Node Remapping' feature is enabled, Pilot PDOs and SDOs won't be tunneled from the primary connection to the secondary connection. Simultaneously, Copilot PDOs and SDOs won't be tunneled from the secondary connection to the primary connection.

## 4. Troubleshooting

### 4.1 Invalid License

When either or both gateways are unlicensed, the *CANopen Tunnel* will run in trial mode.

Device Info
State: Connected
Name: E2CAN Gateway MK2
Firmware: 1.6
License: License Invalid

Please contact *Brunner Elektronik* at [support@brunner-innovation.swiss](mailto:support@brunner-innovation.swiss) for a *CANopen Tunnel* license.

### 4.2 Bad Ping

If the network delay is very bad over a certain period of time, the connection will be dropped.

Network Delay
very bad 113ms
Max: 128ms
Error
Error: Bad Ping

Please check your network connection.

### 4.3 Connection Lost

The 'Connection Lost' error message is shown when the TCP connection experiences a timeout.

Device Info
State: Error
Firmware: 1.10
Error
Error: Connection Lost

Possible causes:

- Ethernet cable was unplugged (even for a short duration)
- Network problems
- The gateway has been power cycled
- Gateway software reset



#### 4.4 Port blocked

If the TCP port is already in use, following error message will be shown.

Device Info
State: Error
Firmware: N/A
Error
Error: Port blocked

Possible causes:

- Wrong port configuration
- Another application is already connected to the TCP port

#### 4.5 Socket timed out

TCP connection could not be established.

Device Info
State: Error
Firmware: N/A
Error
Error: Socket timed out

Possible causes:

- Configured IP is incorrect
- Gateway not connected to the network
- Wrong gateway IP settings

#### 4.6 Generic Socket Error

An unspecified socket error occurred.

Device Info
State: Error
Firmware: N/A
Error
Error: Generic Socket Error

Please check the log file within the *Log* directory for further info.

#### 4.7 Connection failed

An unspecified connection error occurred.

Device Info
State: Error
Firmware: N/A
Error
Error: Connection failed

Please check the log file within the *Log* directory for further information.

#### 4.8 Rx Error

A receive error occurred.

Device Info
State: Error
Firmware: N/A
Error
Error: Rx Error

This error could be an indication of a faulty gateway.

#### 4.9 Old Firmware

The firmware of the gateway is too old and not compatible with the *CANopen Tunnel*.

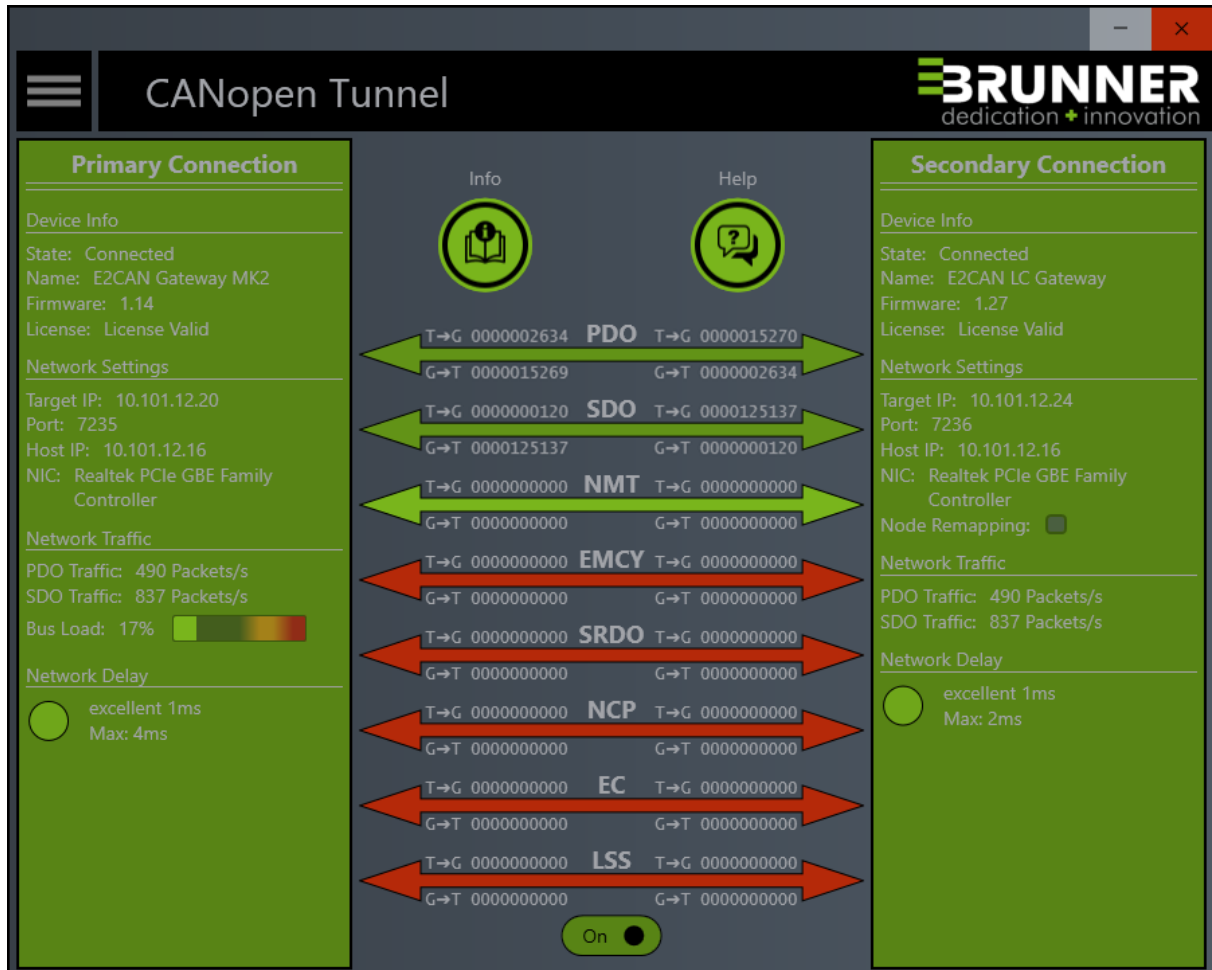
Device Info
State: Error
Firmware: N/A
Error
Error: Old Firmware

Please contact *Brunner Elektronik* at [support@brunner-innovation.swiss](mailto:support@brunner-innovation.swiss) to request the newest gateway firmware.

#### 4.10 Wrong “Node Remapping” setting

A symptom of an incorrect “Node Remapping” setting can be observed when the master does not see the correct number of slave nodes.

##### 4.10.1 Example: “Node Remapping” disabled, when it should be enabled



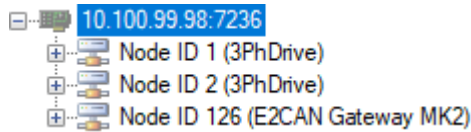
CLS2Sim → Tools → Show device list

Device list					
Node id	Axis	Device type	Fw version	Rev	Serial
Node 1	Roll	MicroDrive: GER1104 CLSE Yoke	FW:387	0x0	0
Node 2	Pitch	MicroDrive: GER1104 CLSE Yoke	FW:387	0x0	0
Node 126	Unknown Produ...				

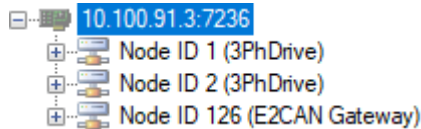
In this example we expect to see Nodes 1, 2, 3 and 4.

Deactivate *CANopen Tunnel* and connect to each gateway individually using *CANopen Commander*. You might need to power cycle the CANopen nodes, because they're possibly in a bus-off state.

Primary connection:

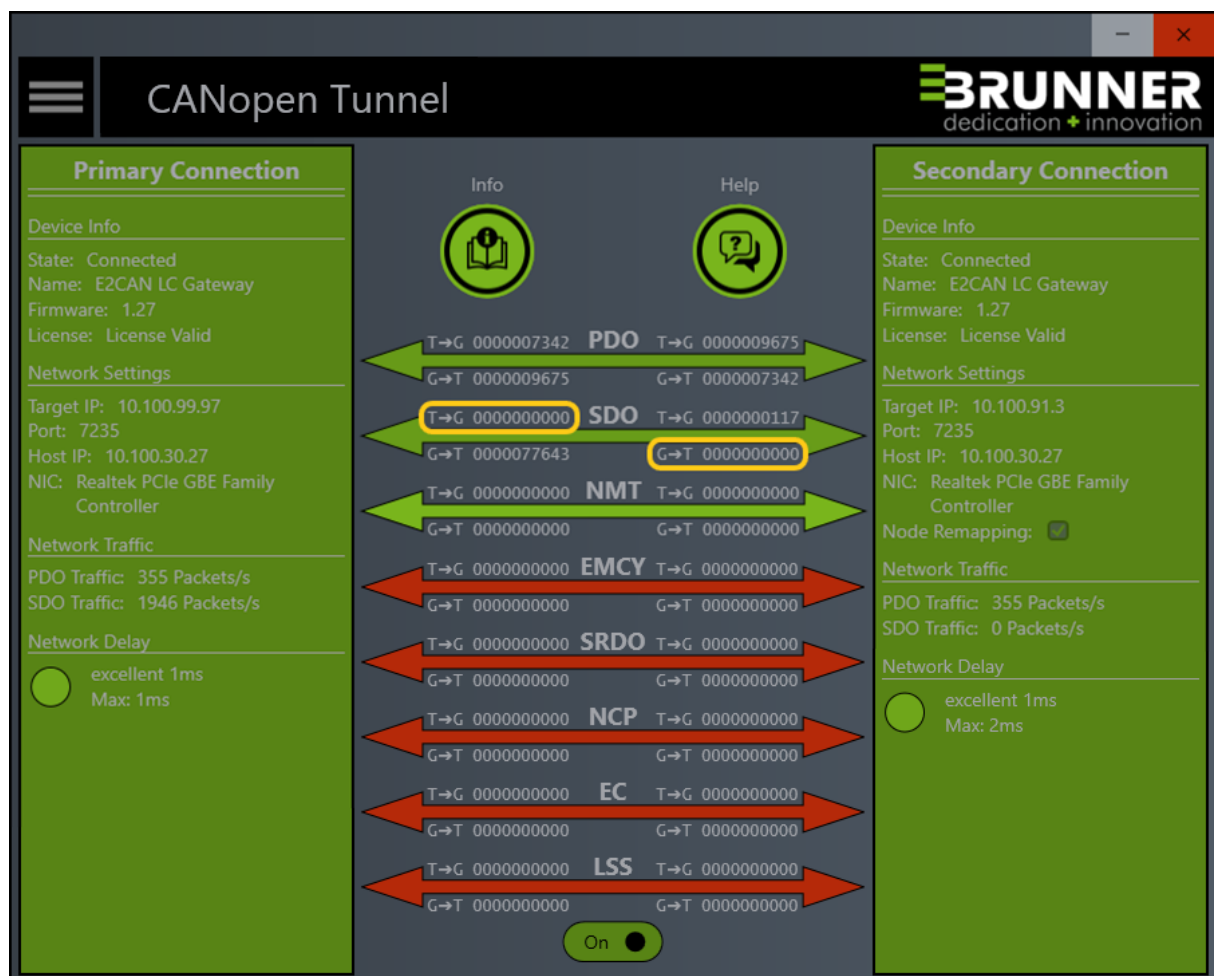


Secondary connection:



In this case both gateways are connected to Pilot nodes, so “Node Remapping” should be enabled.

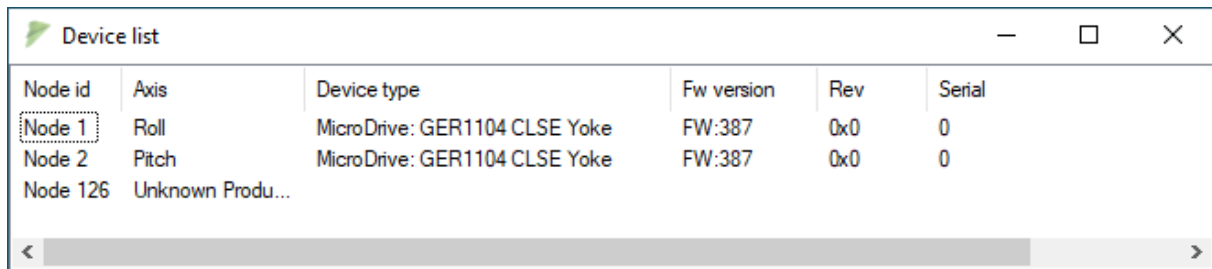
#### 4.10.2 Example: “Node Remapping” enabled, when it should be disabled



The screenshot shows the CANopen Tunnel software interface. It features a central panel with a list of CANopen messages (PDO, SDO, NMT, EMCY, SRDO, NCP, EC, LSS) and their corresponding IDs. The interface is divided into three main sections: Primary Connection, Info/Help, and Secondary Connection. The Primary Connection section shows device info (State: Connected, Name: E2CAN LC Gateway, Firmware: 1.27, License: License Valid) and network settings (Target IP: 10.100.99.97, Port: 7235, Host IP: 10.100.30.27, NIC: Realtek PCIe GBE Family Controller). The Secondary Connection section shows device info (State: Connected, Name: E2CAN LC Gateway, Firmware: 1.27, License: License Valid) and network settings (Target IP: 10.100.91.3, Port: 7235, Host IP: 10.100.30.27, NIC: Realtek PCIe GBE Family Controller). The Node Remapping checkbox is checked. The Network Delay section shows a green circle indicating excellent 1ms delay, with a maximum of 1ms. The Network Traffic section shows PDO Traffic: 355 Packets/s and SDO Traffic: 1946 Packets/s. The Network Delay section shows a green circle indicating excellent 1ms delay, with a maximum of 2ms. The Network Traffic section shows PDO Traffic: 355 Packets/s and SDO Traffic: 0 Packets/s. The Node Remapping checkbox is checked. The Network Delay section shows a green circle indicating excellent 1ms delay, with a maximum of 2ms. The Network Traffic section shows PDO Traffic: 355 Packets/s and SDO Traffic: 0 Packets/s.

When the primary connection gateway doesn't receive SDO messages from the *CANopen Tunnel*, and the secondary connection gateway doesn't transmit SDO messages to the *CANopen Tunnel*, it could be an indication that the “Node Remapping” feature is activated when it shouldn't be.

CLS2Sim → Tools → Show device list

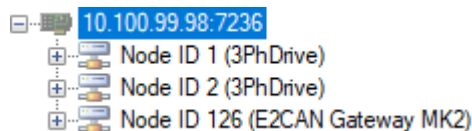


Node id	Axis	Device type	Fw version	Rev	Serial
Node 1	Roll	MicroDrive: GER1104 CLSE Yoke	FW:387	0x0	0
Node 2	Pitch	MicroDrive: GER1104 CLSE Yoke	FW:387	0x0	0
Node 126	Unknown Produ...				

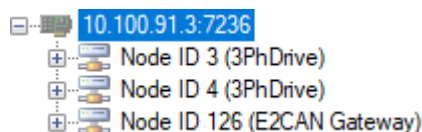
In this example we expect to see Nodes 1, 2, 3 and 4.

Deactivate *CANopen Tunnel* and connect to each gateway individually using *CANopen Commander*. You might need to power cycle the CANopen nodes, because they're possibly in a bus-off state.

Primary connection:



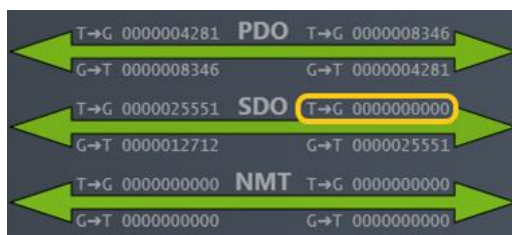
Secondary connection:



In this case the primary gateway sees Pilot nodes, and the secondary gateway sees Copilot nodes. "Node Remapping" should be disabled.

#### 4.11 Master connected to the secondary connection while "Node Remapping" is enabled

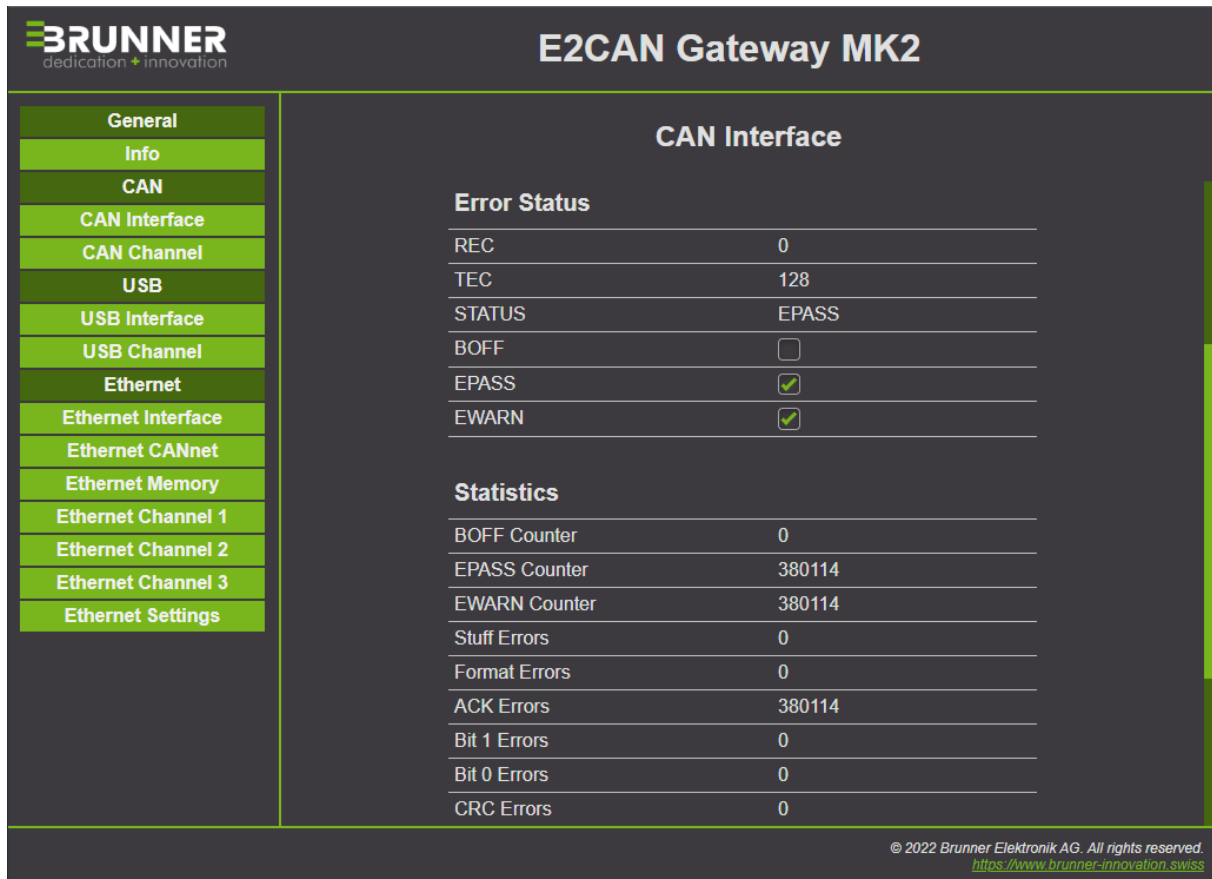
When the master is connected to the secondary connection while "Node Remapping" is activated, it can only see the nodes connected to the secondary gateway.



When the secondary connection gateway doesn't receive SDO messages from the *CANopen Tunnel*, it could be an indication that the master is connected to the wrong gateway.

#### 4.12 No CAN node connected to the gateway

When no CAN node is connected to the gateway, the transmitted CAN message won't be acknowledged. This results in an ACK error, which will eventually put the gateway in *Error Passive* state.



The screenshot shows the 'E2CAN Gateway MK2' software interface. On the left is a navigation menu with options: General, Info, CAN, CAN Interface, CAN Channel, USB, USB Interface, USB Channel, Ethernet, Ethernet Interface, Ethernet CANnet, Ethernet Memory, Ethernet Channel 1, Ethernet Channel 2, Ethernet Channel 3, and Ethernet Settings. The 'CAN Interface' option is selected. The main area displays the 'CAN Interface' status, including an 'Error Status' table and a 'Statistics' table.

Error Status	
REC	0
TEC	128
STATUS	EPASS
BOFF	<input type="checkbox"/>
EPASS	<input checked="" type="checkbox"/>
EWARN	<input checked="" type="checkbox"/>

Statistics	
BOFF Counter	0
EPASS Counter	380114
EWARN Counter	380114
Stuff Errors	0
Format Errors	0
ACK Errors	380114
Bit 1 Errors	0
Bit 0 Errors	0
CRC Errors	0

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#### 4.13 Library Error

Library Error!

When the application displays “Library Error!” on startup, there is a problem with at least one of the libraries.

Please check the log file for the specific reason.

Possible causes:

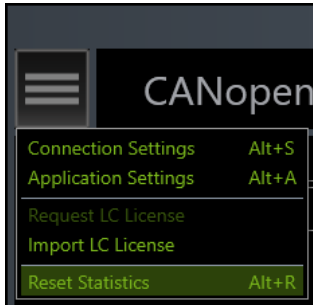
- *ConnectionSettings.dll* is missing
- *CtLcLicCkLib.dll* is missing
- The *Microsoft Visual C++ Redistributable package for Visual Studio 2022* isn't installed

The DLLs and the *Microsoft Visual C++ Redistributable package* should be packaged with this application. If not, please contact *Brunner Elektronik* at [support@brunner-innovation.swiss](mailto:support@brunner-innovation.swiss).

## 5. Misc

### 5.1 Reset Statistics

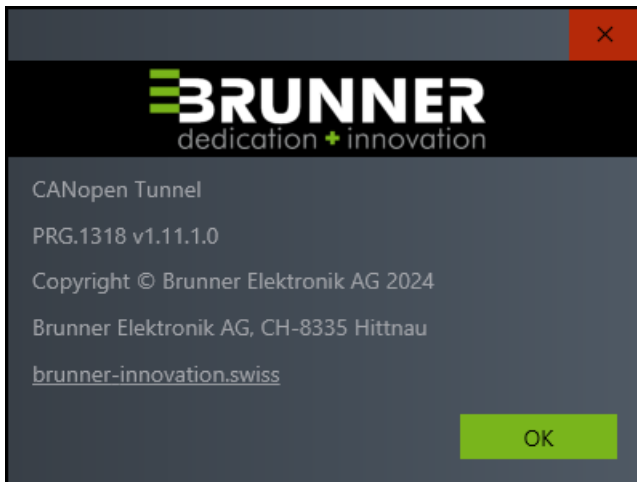
The option to reset statistics can be accessed from the navigation bar in the upper left corner, or by pressing the ALT+R hotkey.



This will reset network traffic, network delay, and protocol statistics.

### 5.2 Application Info

Click on the “Info” button to check the application info.



### 5.3 Help

Click on the “Help” button to open up this User Guide.