Caliper2PC Interface with Wifi functionality

Caliper2PC interface versions 3.75 (and higher) can be connected to the host via Wifi beside via USB. The connection via Wifi offers many advantages over a USB connection. Since there is no electrical connection between the host and the interface via Wifi, the host and the interface are galvanically isolated from each other. Host and interface can run on separate power supplies. With increasing length, USB cables are increasingly susceptible to EMC interference despite shielding and ferrite core filters. Wifi can greatly increase the distance between the interface and the host. If the Caliper2PC interface is connected to a Wifi network that is connected to the Internet via a router, the possible distance to the host is even unlimited. A data capturing or data monitoring from a distance is thus possible. The TCP / IP protocol used for Wifi communication ensures error-free data transmission between the Caliper2PC interface and the host. Different host devices can be used without having to unplug and replug the USB cable. If a stationary PC is used as a host, it is possible to switch for example to a smart phone or a tablet if necessary. The Wifi connection can be easily disconnected in the software and reconnected to other devices.

The Caliper2PC interface can be connected to a router or an access point as a station in an existing Wifi network. The connection of the interface as a station is very convenient because the existing host connection does not need to be disconnected from the local Wifi network. If no Wifi infrastructure is available, the Caliper2PC interface can be used as an access point. The host can then be connected directly to the Wifi network provided by the Caliper2PC interface.

A prerequisite for Wifi support is that the Caliper2PC interface has firmware version 3.75 or higher. To determine the firmware version of the interface, please open the "Caliper2PC Interface - Settings" window like this:

"Main menu" -> "Input" -> "Settings"

The firmware version of the currently connected Caliper2PC interface appears in the upper right corner of the settings window.
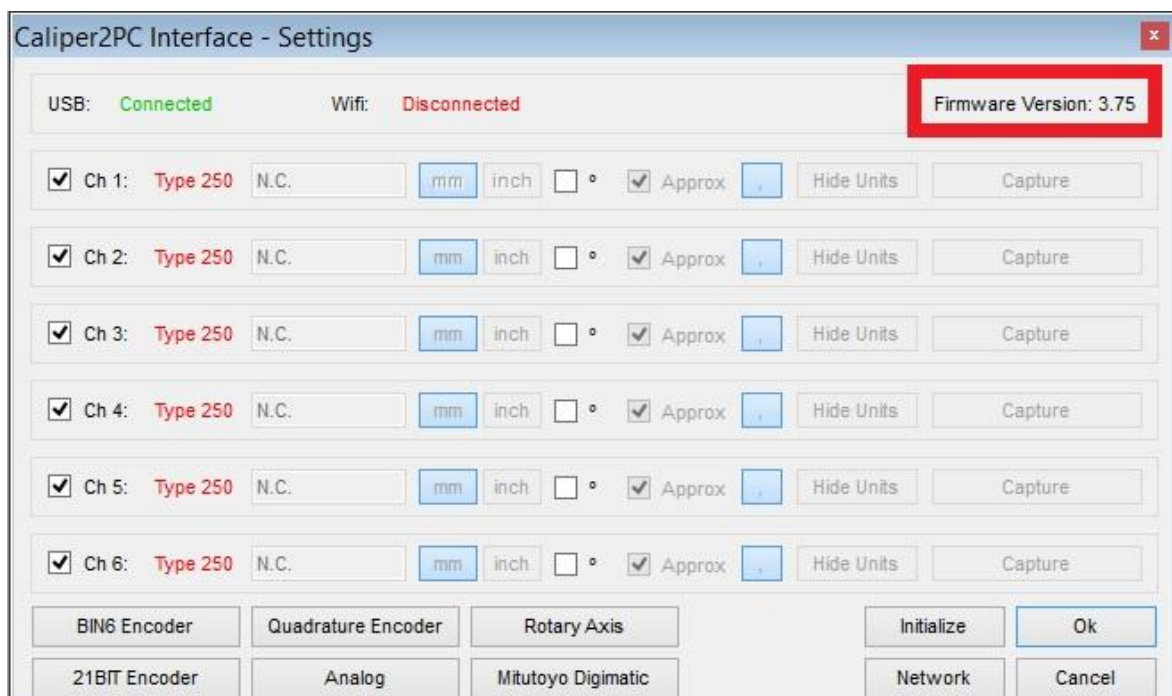
If the interface supports Wifi, it can now be configured as an access point or as a station. If the firmware version of the interface is before 3.75 Wifi is not supported. Upgrading interface versions prior to 3.75 to Wifi is not possible.

Please note that a perfect Wifi infrastructure with low latency is essential for the Caliper2PC interface to work properly through Wifi. Software that blocks the Wifi adapter should be disabled.

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## Configuring the Caliper2PC Interface as Access Point

If no local Wifi network is available, the Caliper2PC interface can be configured as an access point. The Caliper2PC interface sets up its own Wifi network to which the host can connect.

Please disconnect all encoders from the Caliper2PC interface first. Connect the Caliper2PC interface via USB cable to a Windows PC on which the Caliper2PC software is installed. Start the Caliper2PC software. After the system has been initialized, turn on the Wifi:
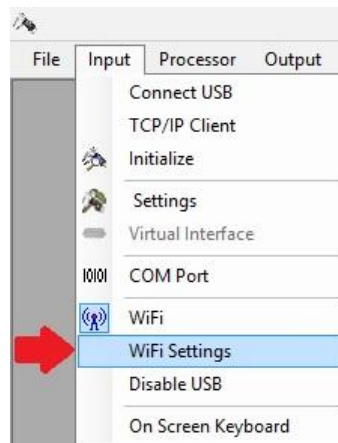
"Main menu" -> "Input" -> "Wifi"
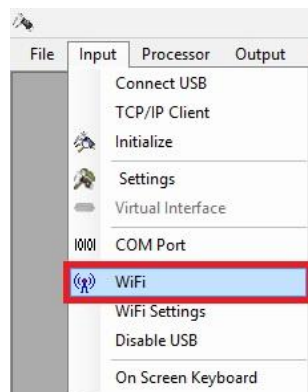
If Wifi has been switched on successfully, the Wifi symbol in the submenu "Input" appears as follows:
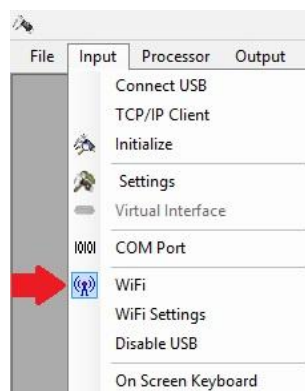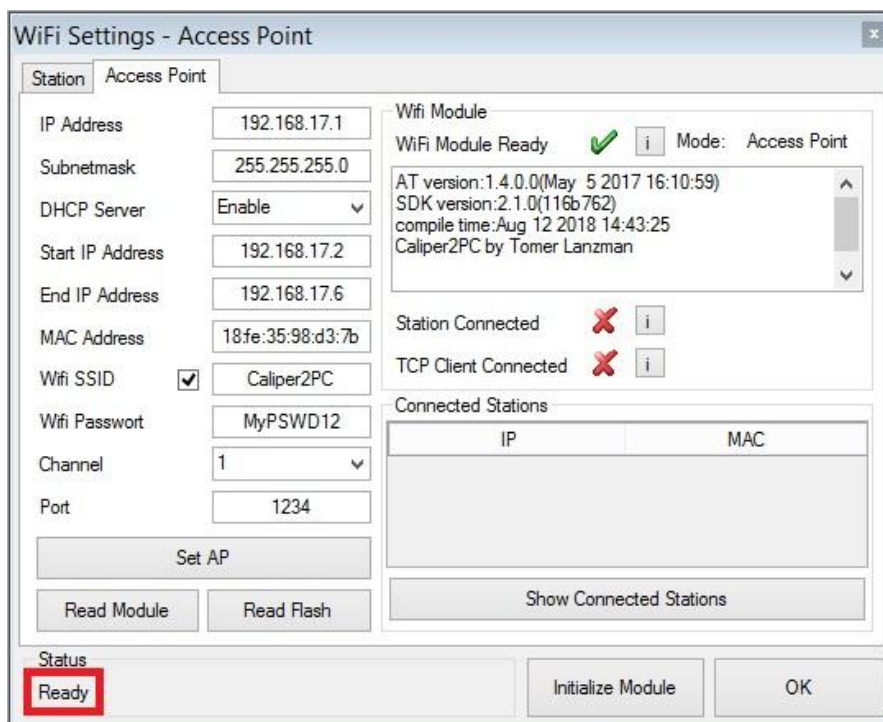
Open the "WiFi Settings" window like this:

"Main menu" -> "Input" -> "Wifi Settings"

After the "WiFi Settings" window appears, please wait until the "Status" (on the bottom left of the window) is set to "Ready", this may take a few seconds.

In the "WiFi Settings" window, please select the "Access Point" tab and fill in the following input fields with valid values:

| Field	Value	Meaning
IP Address	192.168.17.1	IP Address of the Caliper2PC Interface
Subnetmask	255.255.255.0	Subnet mask of the Caliper2PC Interface
DHCP Server	Enable	Caliper2PC Interface is responsible for the IP Address assignment to the client
Start IP Address	192.168.17.2	This IP Address will be assigned to the first client
End IP Address	192.268.17.6	Last IP Address that can be assigned
MAC Address	18:FE:35:98:D3:7B	Physical Address of the Caliper2PC Interfaces
Wifi SSID (Broadcast)	Check Box is checked	Wifi network name (SSID) will be broadcast
Wifi SSID	Caliper2PC	Wifi network name (SSID)

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Wifi Password	MyPSWD12	This password is requested when logging on to the Caliper2PC Wifi network
Channel	1	Wifi broadcast Channel
Port	1234	Port Number that the client must use

Please change the values specified in the table only if absolutely necessary. After all values have been set, they must be written to the flash memory. Please click the button "Set AP".
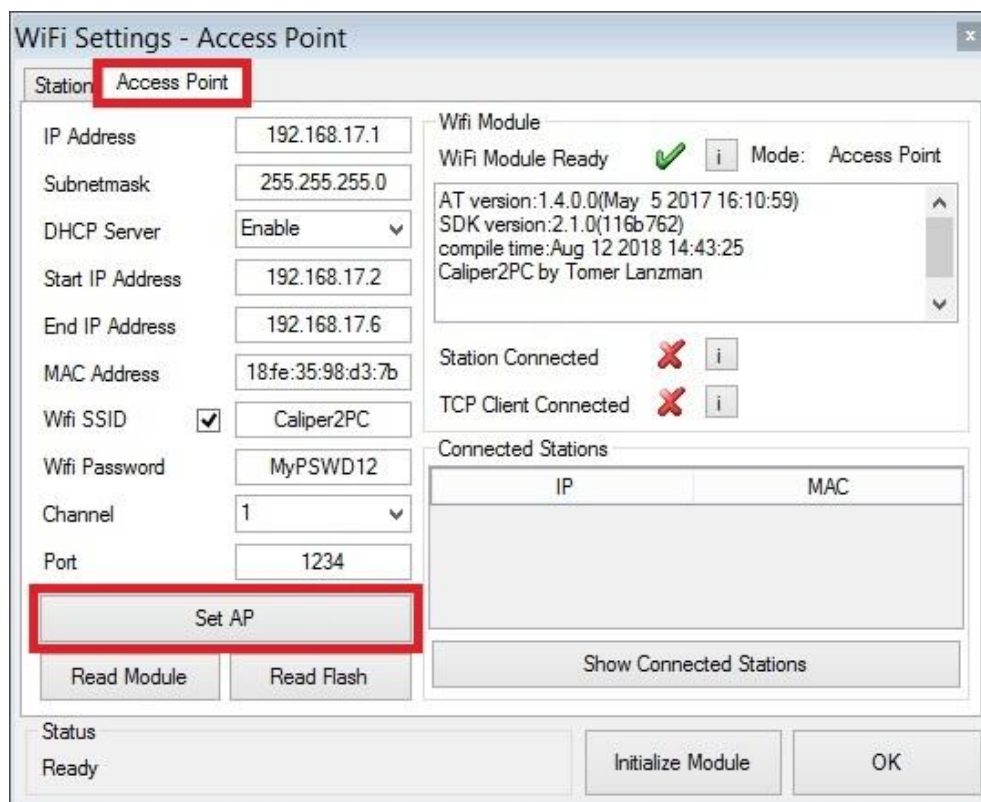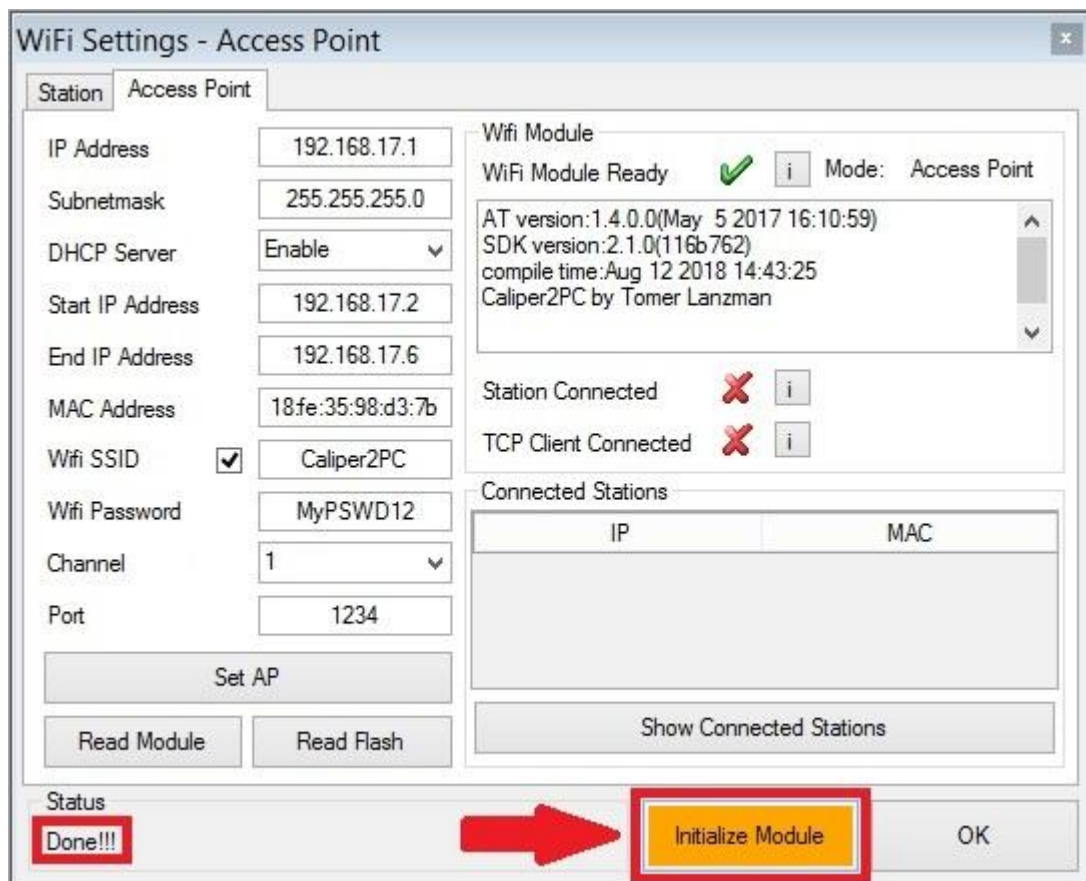

As soon as all values have been set in the flash memory, the status is set to "Done". The Wifi module can now be initialized. To do this, click the "Initialize Module" button in orange. Please close the Caliper2PC software.

Connecting Wifi using the Caliper2PC interface as Access Point

A prerequisite for a Wifi connection with the interface is that the host has a 2.4Ghz 802.11N / G / B WLAN card. All laptops available on the market today have a WLAN card integrated and can be connected via Wifi without additional hardware. If a PC without a WLAN card is used as a host, a USB WLAN adapter must be installed. These adapters can be found in every computer shop for little money.

Please Note: Before the Caliper2PC software can communicate with the interface via Wifi, it must be ensured that there is no existing USB connection to the host (see page 25).

The host must be connected to the Caliper2PC interface's Wifi network first. Click on the network icon in the taskbar.

This opens the network panel displaying all available Wifi networks nearby. Select the Caliper2PC interface's Wifi network "Caliper2PC" ("Wifi SSID as defined in the settings) and click "Connect".
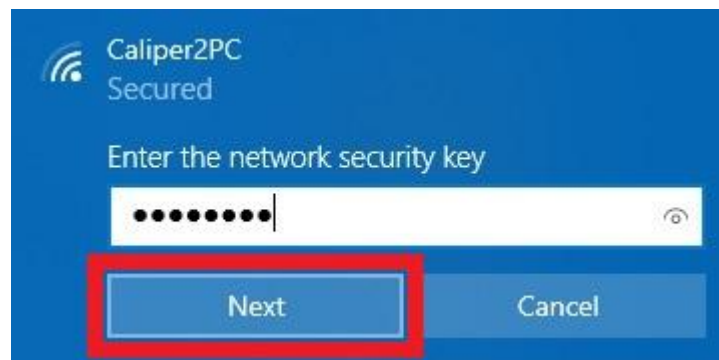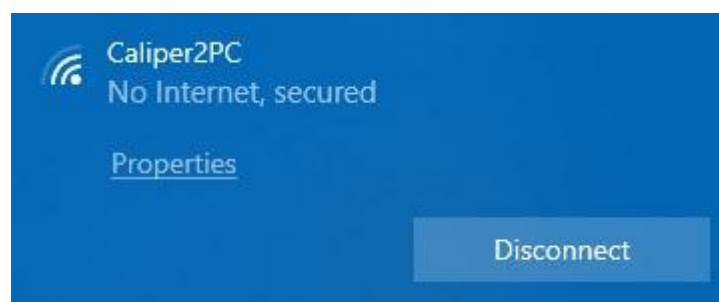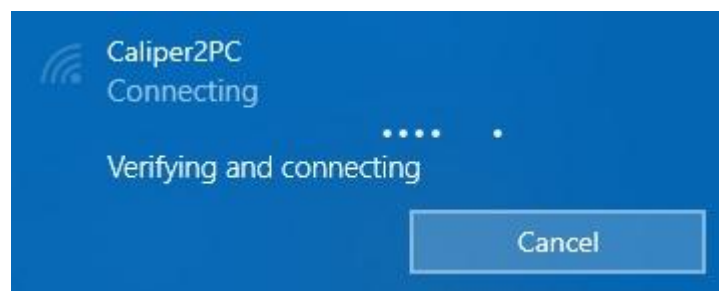

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If a Wifi password has been set in the "Wifi Settings" window (eg. "MyPSWD12"), please enter it into the input field for the network security key and then click on the "Next" button.

The password is checked and the Wifi network is connecting.

After the host has been connected to the Caliper2PC Wifi network please start the Caliper2PC software.

Open the "TCP/IP Client" window like this:

"Main menu" -> "Input" -> " TCP/IP Client"

In the "IP Address" field of the "TCP / IP Client" window, please enter the IP address of the Caliper2PC interface (for example, 192.168.17.1 see page 5). In the "Port" field, enter the port number defined in the interface (for example, 1234 see page 6). Then click the "Save" button to apply the values. Click on the "Connect" button to connect the TCP / IP client to the interface. As soon as the TCP / IP client has been successfully connected to the Caliper2PC interface, the Wifi icon appears in the Caliper2PC software in orange.

If communication between the Caliper2PC software and the interface has been successfully established, the Wifi symbol appears in the software as an active transmission mast (green, blue, red).


An established Wifi connection is signalized in the Caliper2PC interface by a blue LED.

Configuring the Caliper2PC Interface as Station

If a Wifi infrastructure (access point or Wifi router) is available, the Caliper2PC interface can be connected to this network as a station. To configure the Caliper2PC interface, please disconnect all encoders from the interface and connect the interface via USB cable to a Windows PC on which the Caliper2PC software is installed. Start the Caliper2PC software. After the system has been initialized, turn on the Wifi:
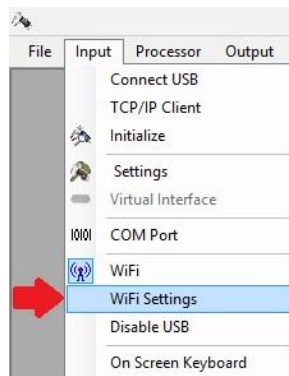
"Main menu" -> "Input" -> " WiFi"
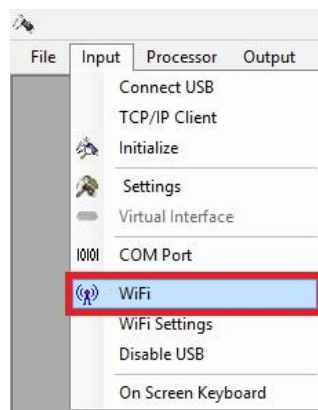
As soon as Wifi has been successfully enabled, the Wifi symbol in the submenu "Input" appears as follows:
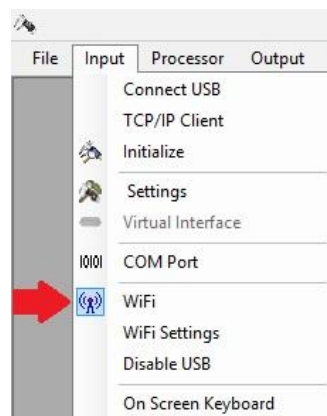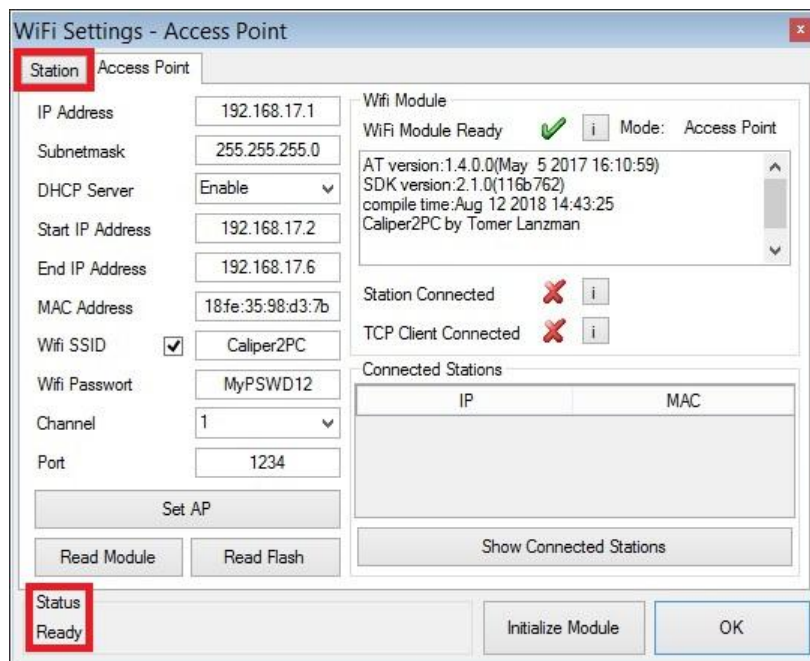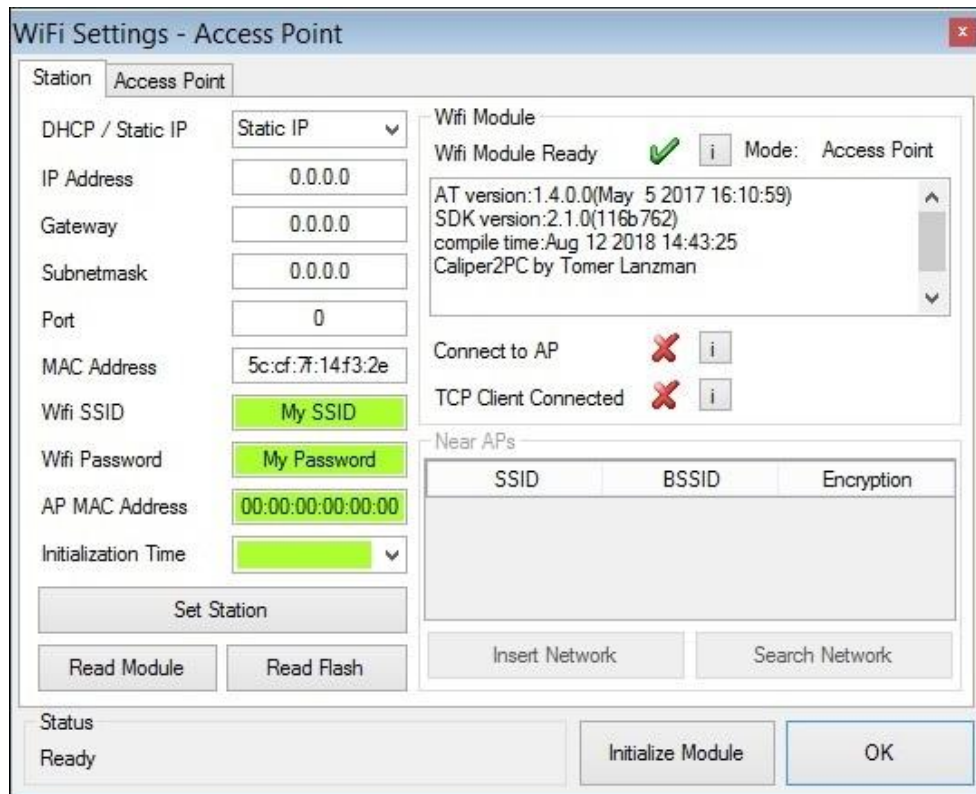
Open the "WiFi Settings" window this way:

*"Main menu" -> "Input" -> "WiFi Settings"*

After the "WiFi Settings" window appears, please wait until the "Status" (bottom left of the window) is set to "Ready". This may take a few seconds.

Click on the "Station" tab to open the configuration mask.

The appropriate IP address, subnet mask and gateway for the existing network can be taken from a local computer connected to the network. Please press the key combination "Windows (⊞)" + "R" and type the command "cmd" into the "Open" line of the "Run" window. Click the "OK" button to open a Command Prompt window.
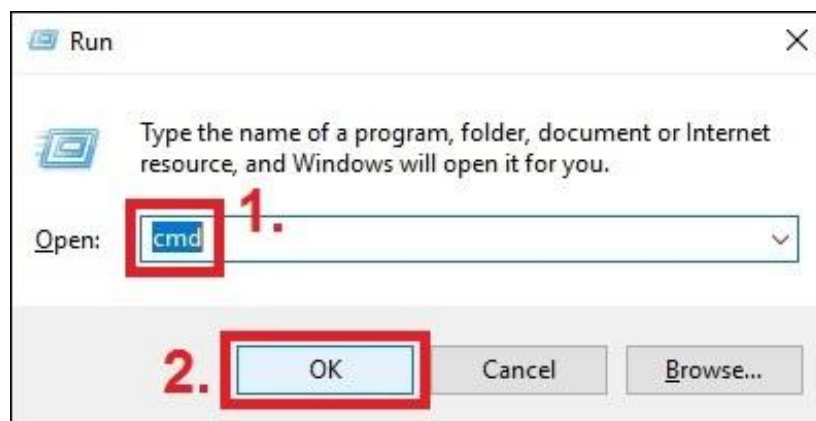
Type "ipconfig" at the command prompt and then click the "Enter" key. The Windows IP Configuration is displayed.
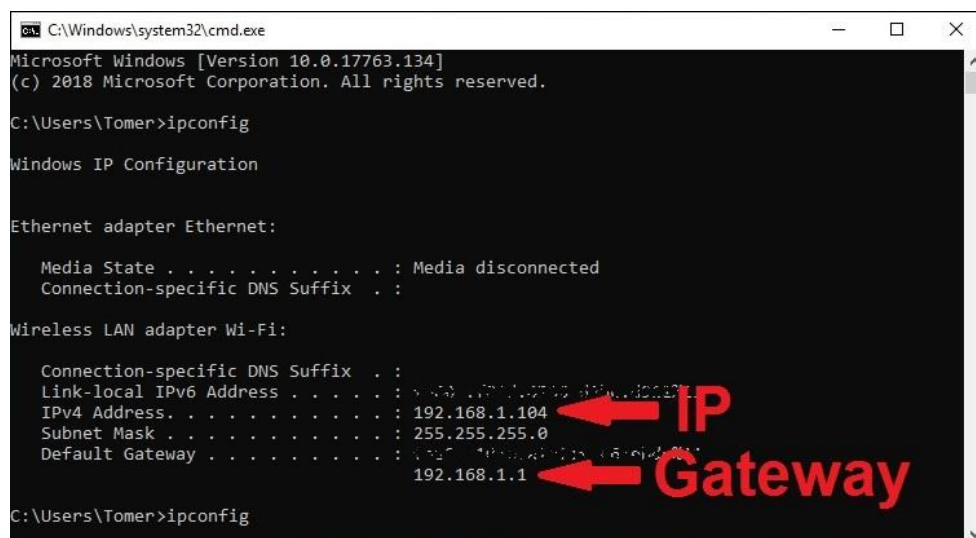

For the active network adapter, the IP address, the subnet mask and the default gateway appear. Make a note of these values and close the Command Prompt window. The default gateway and the subnet mask can be adopted directly in the "WiFi Settings" window in the "Gateway" and "Subnet Mask" fields. The first three numbers of the IP address (e.g. 192.168.1.X) can also be copied.

The fourth number "X" of the IP address must be a valid number (0 - 255) that is not used by any other device on the network. In the example shown here, the PC used has the IP address 192.168.1.104 and the gateway has the IP address 192.168.1.1. Accordingly, these addresses are occupied and cannot be assigned to the Caliper2PC interface as a station. The router's DHCP server in the network shown here is configured to assign IP addresses starting at "X" = 100. Therefore, all devices that obtain the IP address from the DHCP server have an IP address where "X" is equal to or greater than 100. The Caliper2PC interface should be set to Static IP when configured as a station to guarantee that the interface always has the same static IP address. Otherwise, the Caliper2PC software must always specify the current IP address in order to connect to the Caliper2PC interface via Wifi. In the example shown here, the value "17" is selected for "X" so that 192.168.1.17 is entered in the input field for the IP address. This IP address is not used by any other device in the network shown here. The port can be any number between 0 and 65535. For the sake of simplicity, the port "1234" is selected here. Remember the IP address (192.168.1.17) and the port (1234), as these values set in the interface for the Wifi connection must be set in the client within the Caliper2PC software.

The MAC address (e.g. 5C:CF:7F:14:F3:2E) is the physical address of the interface. If MAC address filtering is enabled in your router, please add the MAC address of the interface to allowed MAC addresses table so that the interface can be connected to the Wifi network and will not be blocked by the router's MAC address filtering.
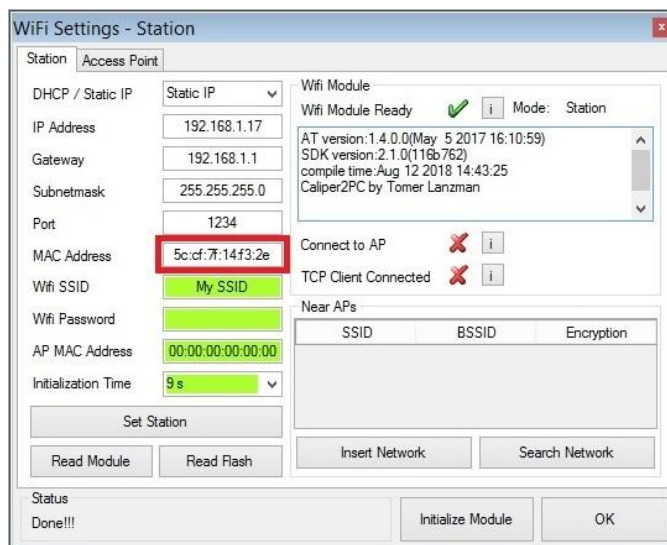
Please set the "Initialization Time" to 9 seconds. This is the time the interface will try to connect via Wifi before the USB interface is activated. The initialization time depends on the respective router or access point. The selected 9 seconds should be sufficient for most devices. All values used in this example are shown in the following table:

Field	Value	Meaning
DHCP / Static IP	Static IP	Caliper2PC Interface has a fixed IP address and does not obtain it from the router's DHCP server.
IP Address	192.168.1.17	IP Address of the Caliper2PC Interface
Gateway	192.168.1.1	IP Address of the Default Gateway (= Router's IP)

|		
Subnetmask	255.255.255.0	Subnet mask of the Wifi Network
Port	1234	Port Number that must be used by the Client
MAC Address	5C:CF:7F:14:F3:2E	Physical Address of the Caliper2PC Interface
Initialization Time	9 Seconds	The time the interface tries to connect via Wifi before the USB interface is activated

Change the values specified in the table only if absolutely necessary. After all values have been set, they must be written into the flash memory. Please click the button "Set Station".
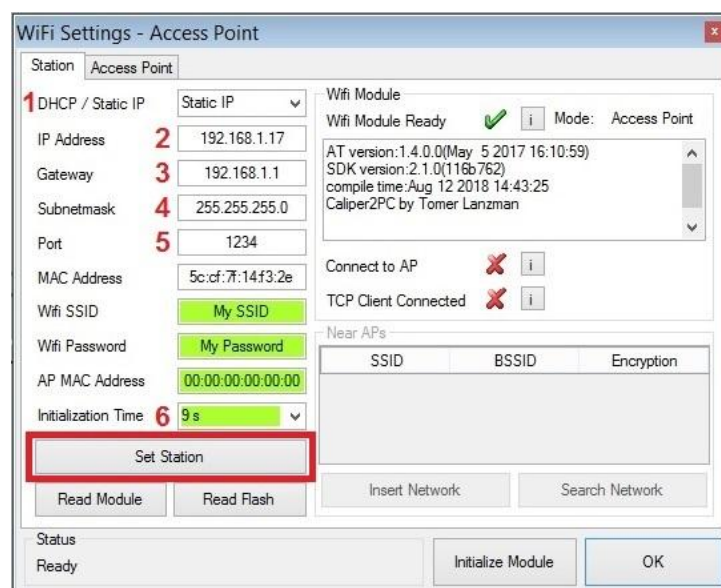
As soon as all values have been written into the flash memory, the status "Done!!!" appears. The Wifi module can now be initialized. To initialize the module, please click the "Initialize Module" button that is shown in orange. Close the Caliper2PC software and then restart it.
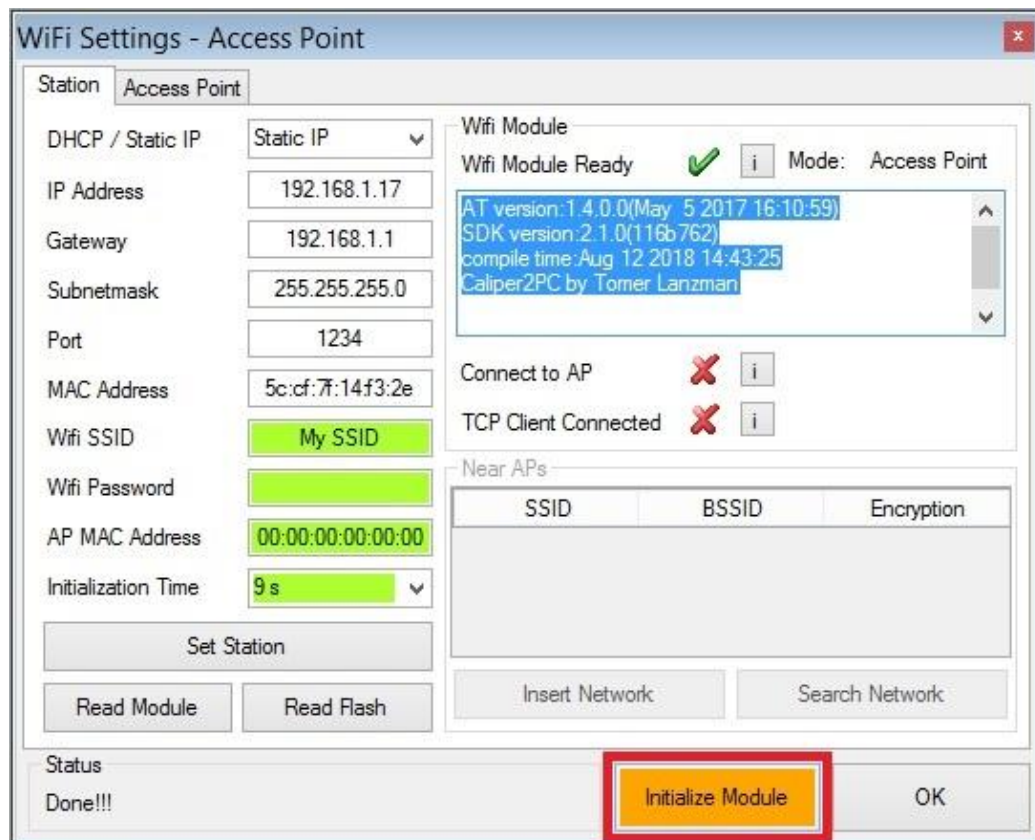

After the Caliper2PC software has been restarted, open the "WiFi Settings" window and wait until the status is set to "Done!!!". Click the "Read Flash" button so that the software will fill the input masks with the values from the flash memory.
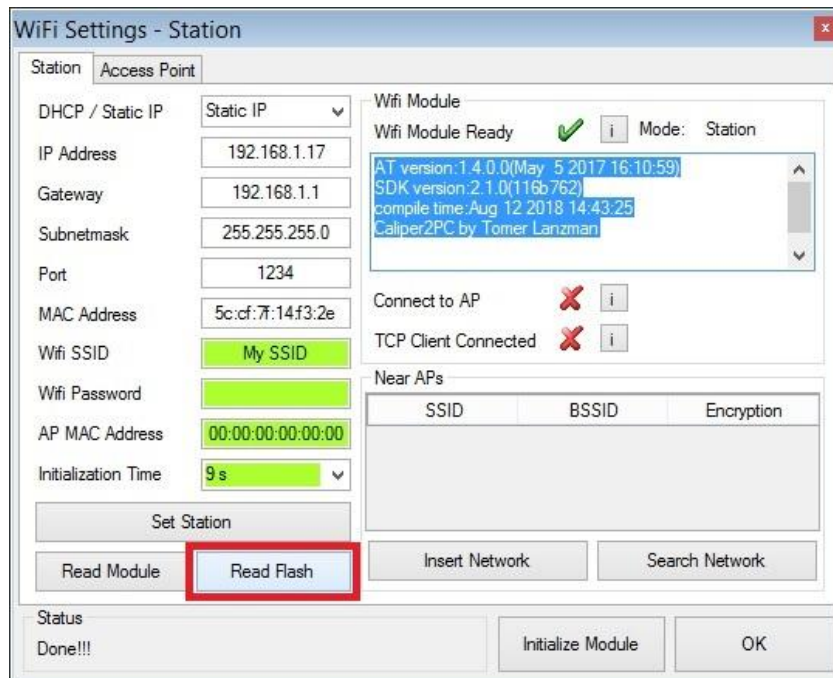
Click the "Search Network" button to search for available Wifi networks near the Caliper2PC interface.
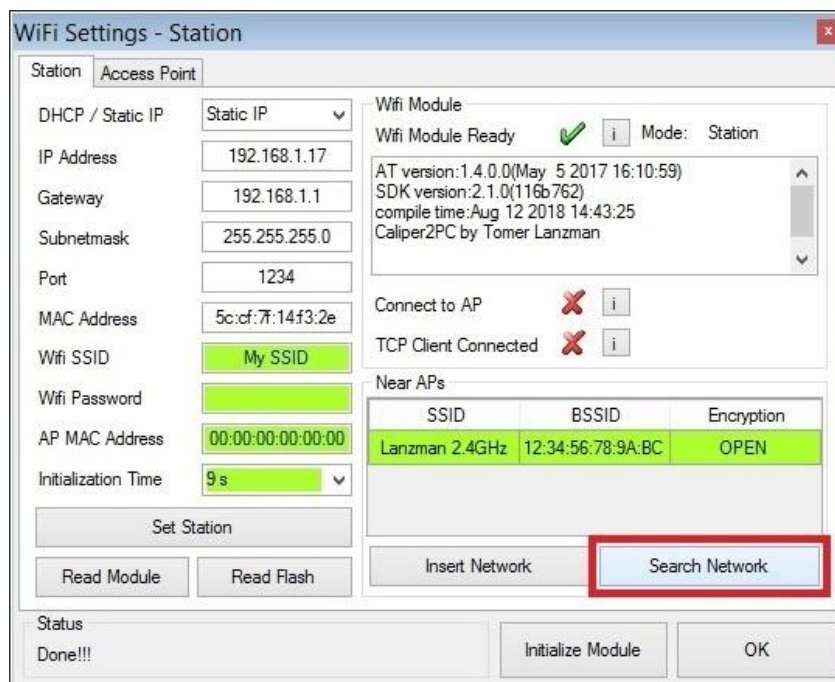
Select your Wifi network from the "Near APs" table and then click the "Insert Network" button to insert the Wifi SSID and the AP MAC Address (BSSID) into the green input fields.
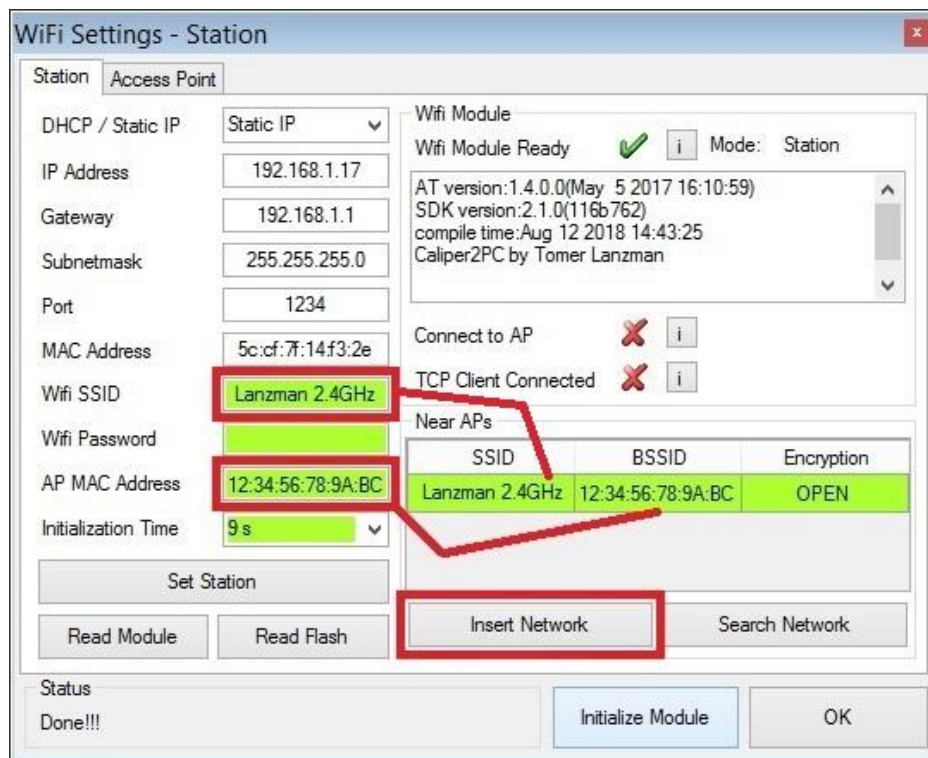
If your Wifi network is not encrypted, leave the input field "Wifi Password" empty. If your Wifi network is encrypted, enter the Wifi password into the input field. Click the "Set Station" button to write the values to the flash memory. After the status has been set to "Done!!!", click the "Initialize Module" button that appears in orange color.
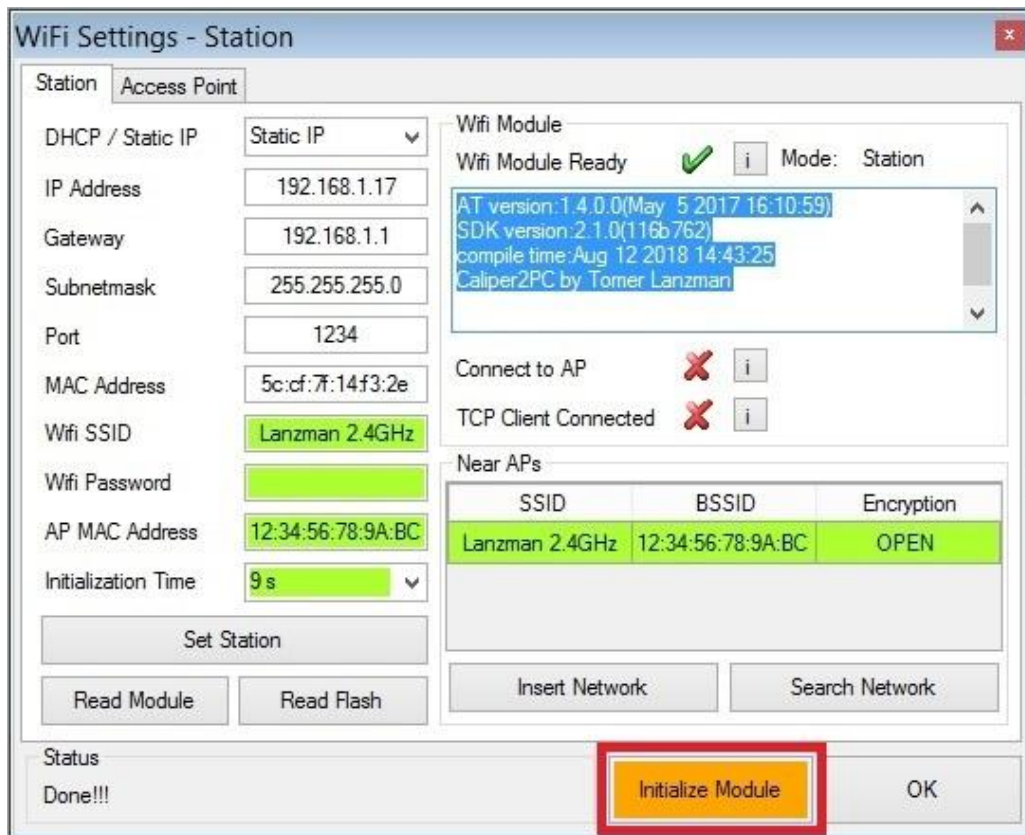
Close the Caliper2PC software and then restart it. The Caliper2PC interface is now configured as a station and can be connected to the host via your Wifi network.

Connecting to the Caliper2PC interface as station through Wifi

Please Note: Before the Caliper2PC software can communicate with the interface through Wifi, it must be ensured that there is no existing USB connection to the host (see page 25).

Start the Caliper2PC software and open the window "TCP / IP Client" like this:

"Main menu" -> "Input" -> " TCP/IP Client"

Please enter the IP address of the Caliper2PC interface (for example 192.168.1.17 see page 16) in the "TCP / IP Client" window's "IP Address" field. In the "Port" field, enter the port number defined in the interface (for example, 1234 see page 16). Then click the "Save" button to apply the values. Click on the "Connect" button to connect the TCP / IP client to the Caliper2PC interface.

As soon as the TCP / IP client has been successfully connected, the Wifi icon appears in orange within the Caliper2PC software.

As soon as communication between the Caliper2PC software and the interface has been successfully established, the Wifi symbol appears in the software as an active transmission mast (green, blue, red).


An established Wifi connection is signalized in the Caliper2PC interface by a blue LED.

USB- and Wifi-Connection

The Caliper2PC interface has 2 different ways to communicate with the host. However, it cannot be connected simultaneously via USB and Wifi. The USB connection has the first priority. Only if there is no USB connection between the Caliper2PC interface and the host, the interface can be connected via Wifi. If the interface is powered by a 5V USB power supply (such as a mobile phone charger), there is no USB connection to the host and the interface is able to communicate with the software via Wifi. If the Caliper2PC interface is connected to the host through USB, Wifi communication cannot be established. In the Caliper2PC software, the USB connection to the host can be softwarely separated so that a Wifi connection can be established despite the connected USB cable. The USB connection can be disabled this way:

"Main menu" -> "Input" -> "Disable USB"
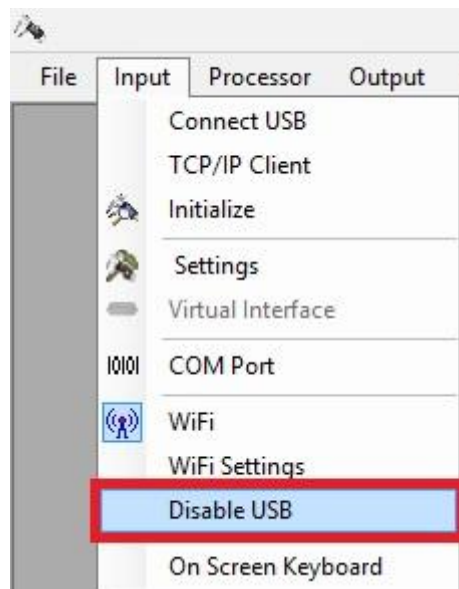
Switching off the USB connection is signaled acoustically in the Caliper2PC software. The USB "LED" in the lower left corner of the window changes from green (USB connected) to red (USB disconnected).

As soon as the USB connection has been switched off, the interface is ready to communicate with the host via Wifi.

Please Note:

Re enabling the USB interface after it has been disabled is only possible by disconnecting and reconnecting the USB cable (or by turning the power supply off and then on again).