

# TDC-E “how to” collection

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## 1. Connecting to TDC-E via serial (micro USB) port

To connect to TDC-E via micro USB serial port, the device must be open, i.e. the bottom cover of the device must be unscrewed and taken off, which will expose the micro USB port. This port must be used to connect your work PC to the device using a proper cable.

Tools needed:

- SSH agent (Kitty, Putty, ...)
- Micro USB to USB cable (thin or low quality cables will not work)

This guide will use Putty as example, and using Windows as work PC OS.

### 1.1. Establishing the connection

Once the cable is connecting the TDC-E with your PC, we need to find which COM number is assigned to the serial port. In Windows, this is done in Device Manager like the image below suggests.

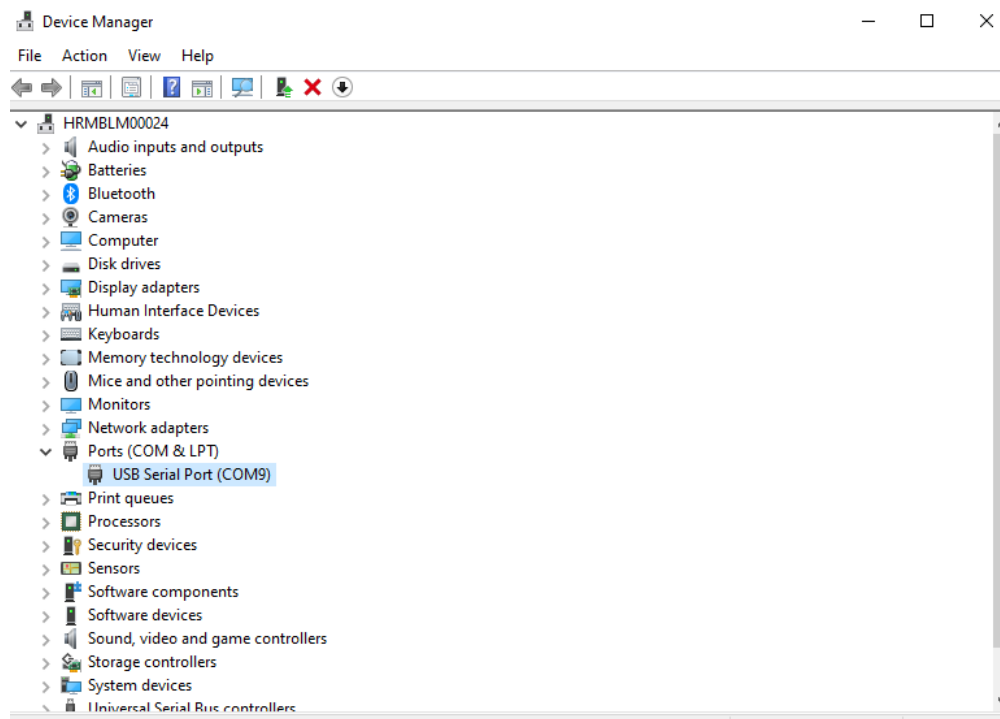


Image 1: checking COM port number in Device Manager on Windows PC

## Setup in Putty/Kitty

Once the serial COM port number is known, this needs to be configured in Putty/Kitty as the image below suggests. Click on the connect button will open a console window.

**Note that in the console window there will be no activity**, so it is necessary for the user to „wake it up“ by focusing the console window and pressing „Enter“ key several times.

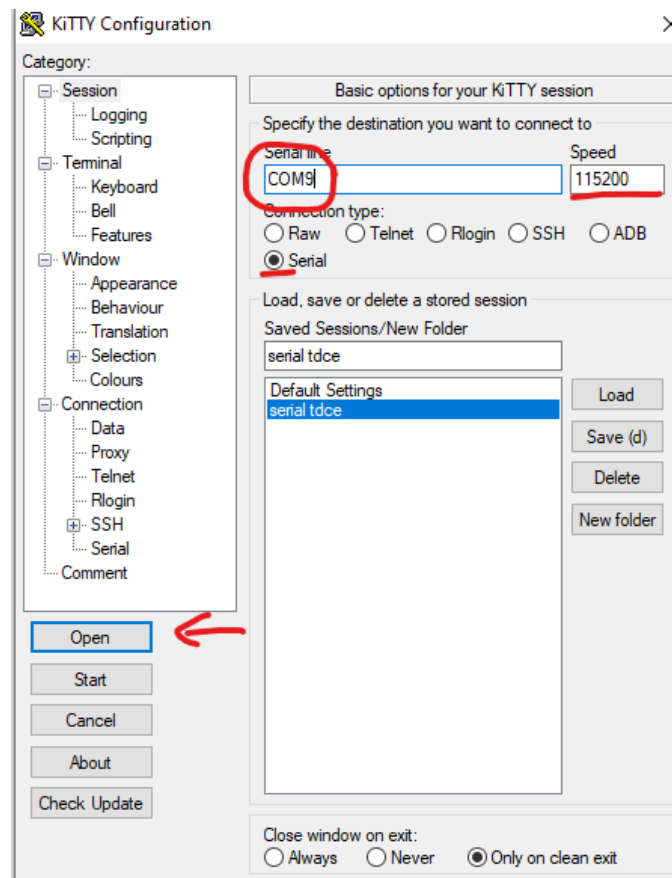


Image 2: Putty/Kitty configuration for serial connection

If there is no activity after pressing „Enter“ key, then the user must unplug and replug the USB cable on the PC side while the console window is still open. After this, try sending in several more „Enter“ keys.

If a connection is successfully, the console window should look like in the image below:



## 2. Reverting network settings to factory using SSH/serial access

On TDC-E users are given maximum freedom to set up networking of the device to suit their needs and the needs of their customers. Event though some restrictions and checks are in place to prevent users blocking themselves out of the device, it is still possible to loose network connectivity to TDC-E.

This section will expand on how to use serial terminal access to make the device load default network settings.

Tools needed:

- Micro USB to USB cable for serial connection (assuming no LAN connection is possible)
- Putty/Kitty as connection agent

NOTE that the following steps will delete all user-configured networking segments settings.

This guide assumes that serial connection is established as described in [Connecting to TDC-E via serial \(micro USB\) port](#)

### 2.1. Deleting configuration files to force factory settings load

In order to delete network segment config files, we need to move to the proper location on the TDC-E file system as shown in the image below, by executing the „cd ...“ (change directory) command and specifying the path „/mnt/conf/dm/settings/networking“.

```
root@tdce:~ # cd /mnt/conf/dm/settings/networking/  
root@tdce:/mnt/conf/dm/settings/networking #
```

*Image 4: Filesystem position of network configuration*

#### Checking the networking configuration directory

If we list all the files in this location, we can see what config files exist here as show in the image below by using „ll“ command

```

root@tdce:/mnt/conf/dm/settings/networking # ll
total 14
-rw-r--r-- 1 root root 649 Aug 24 2022 Dm.Net.Dhcp
-rw-r--r-- 1 root root 649 Aug 24 2022 Dm.Net.Dhcp.0.bak
-rw-r--r-- 1 root root 68 Aug 24 2022 Dm.Net.Dns.DnsManager
-rw-r--r-- 1 root root 68 Aug 24 2022 Dm.Net.Dns.DnsManager.0.bak
-rw-r--r-- 1 root root 257 Nov 3 08:00 Dm.Net.Interfaces.Repo
-rw-r--r-- 1 root root 257 Nov 3 08:00 Dm.Net.Interfaces.Repo.0.bak
-rw-r--r-- 1 root root 678 Mar 29 08:11 Dm.Net.Segments
-rw-r--r-- 1 root root 678 Mar 29 08:11 Dm.Net.Segments.0.bak
-rw-r--r-- 1 root root 27 Feb 1 08:19 Dm.Net.Wlan.Agent
-rw-r--r-- 1 root root 27 Feb 1 08:19 Dm.Net.Wlan.Agent.0.bak
-rw-r--r-- 1 root root 127 Aug 24 2022 Dm.Net.Wlan.Ap
-rw-r--r-- 1 root root 127 Aug 24 2022 Dm.Net.Wlan.Ap.0.bak
-rw-r--r-- 1 root root 23 Aug 24 2022 Dm.Net.Zeroconf
-rw-r--r-- 1 root root 23 Aug 24 2022 Dm.Net.Zeroconf.0.bak

```

Image 5: Contents of the /mnt/conf/dm/settings/networking folder on TDC-E

This guide will focus on the Dm.Net.Segments file as it contains segments configuration which most often causes connection issues for users.

## Removing the files

To remove these files execute the following command:

```
rm Dm.Net.Segments Dm.Net.Segments.0.bak
```

```

root@tdce:/mnt/conf/dm/settings/networking # rm Dm.Net.Segments Dm.Net.Segments.0.bak
root@tdce:/mnt/conf/dm/settings/networking #

```

Image 6: Removing segments config files

Invoking the listing command („ ll “) verifies that there are no more segment config files as in the image below.

```

root@tdce:/mnt/conf/dm/settings/networking # ll
total 12
-rw-r--r-- 1 root root 649 Aug 24 2022 Dm.Net.Dhcp
-rw-r--r-- 1 root root 649 Aug 24 2022 Dm.Net.Dhcp.0.bak
-rw-r--r-- 1 root root 68 Aug 24 2022 Dm.Net.Dns.DnsManager
-rw-r--r-- 1 root root 68 Aug 24 2022 Dm.Net.Dns.DnsManager.0.bak
-rw-r--r-- 1 root root 257 Nov 3 08:00 Dm.Net.Interfaces.Repo
-rw-r--r-- 1 root root 257 Nov 3 08:00 Dm.Net.Interfaces.Repo.0.bak
-rw-r--r-- 1 root root 27 Feb 1 08:19 Dm.Net.Wlan.Agent
-rw-r--r-- 1 root root 27 Feb 1 08:19 Dm.Net.Wlan.Agent.0.bak
-rw-r--r-- 1 root root 127 Aug 24 2022 Dm.Net.Wlan.Ap
-rw-r--r-- 1 root root 127 Aug 24 2022 Dm.Net.Wlan.Ap.0.bak
-rw-r--r-- 1 root root 23 Aug 24 2022 Dm.Net.Zeroconf
-rw-r--r-- 1 root root 23 Aug 24 2022 Dm.Net.Zeroconf.0.bak
root@tdce:/mnt/conf/dm/settings/networking #

```

Image 7: Verification that segments config is removed

## Rebooting the device

After the files have been removed, the device can be rebooted, either by physically disconnecting the powersupply or by issuing „reboot“ command in the console. Once the device is rebooted, default segment settings should be restored and default static IP 192.168.0.100 on eth0 interface loaded. To check connectivity refer to [Connecting to TDC-E via SSH over LAN](#)

### 3. Connecting to TDC-E via SSH over LAN

To connect to TDC-E over SSH the device must be available on the network with a known IP address. For purposes of this guide, we will use default device configuration with eth0 being available on default IP of 192.168.0.100

Tools needed:

- LAN cable connecting TDC-E eth0 port to work PC
- Putty/Kitty or any other SSH connection agent

#### 3.1. Setting up work PC network interface

LAN communication to the TDC-E will work only if the work PC and TDC-E default IP are on the same subnet. This means that work PC network interface must be set up to use static IP address in the same range from 192.168.0.2 to 192.168.0.254. The 192.168.0.100 is already taken by the TDC-E so this one must not be assigned to PC interface.

On Windows machine this interface is set up by going to Network adapter settings and open Properties of the interface used to connect to TDC-E (image below)

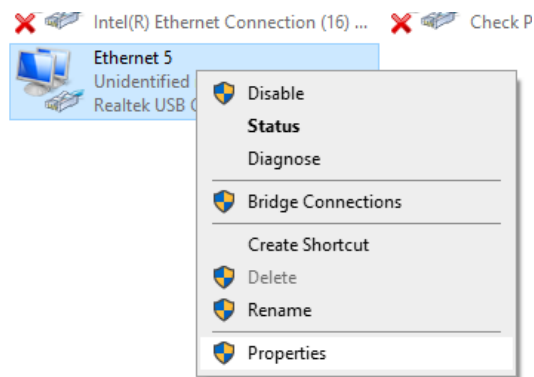


Image 8: Selecting the properties of PC interface

The interface in this example is set up to use statically defined address 192.168.0.15 and corresponding mask is assigned as well. The image below shows the setup.



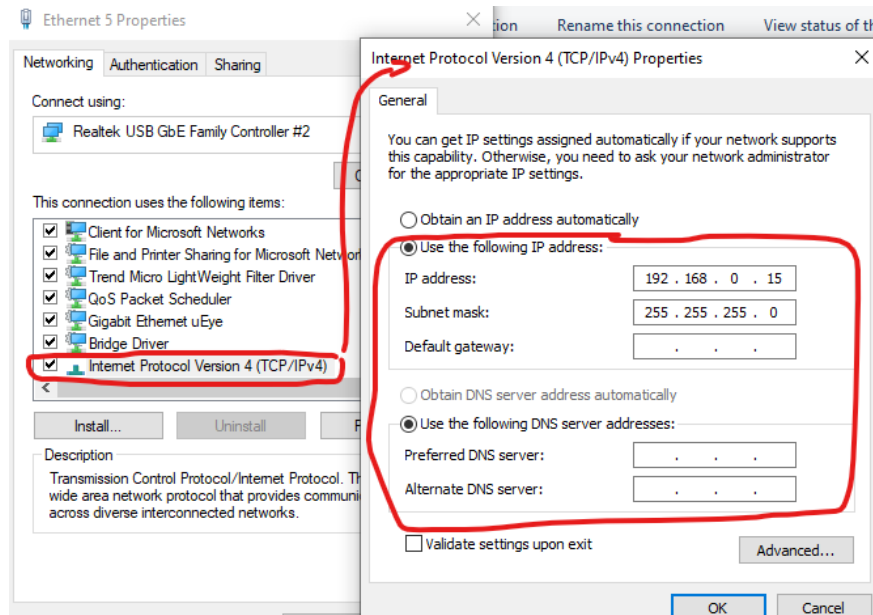


Image 9: Configuring the PC interface to be on the same subnet as TDC-E default interface

### 3.2. Establishing SSH LAN connection

For SSH connection this guide will use Putty/Kitty agent, but same settings can apply to other tools. The image below shows the configuration.

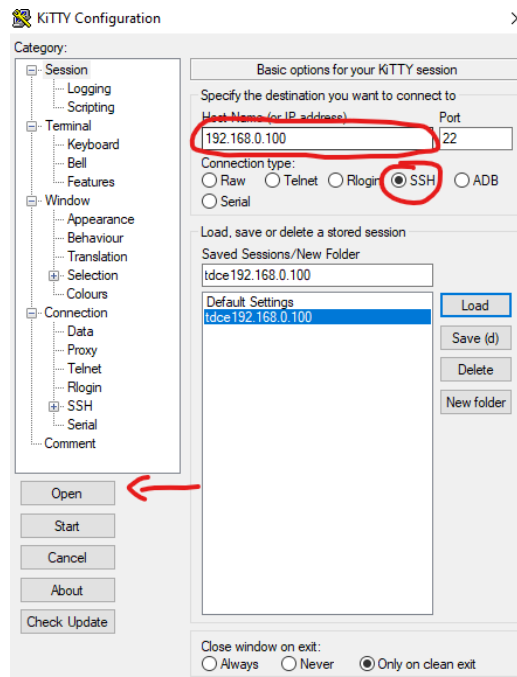
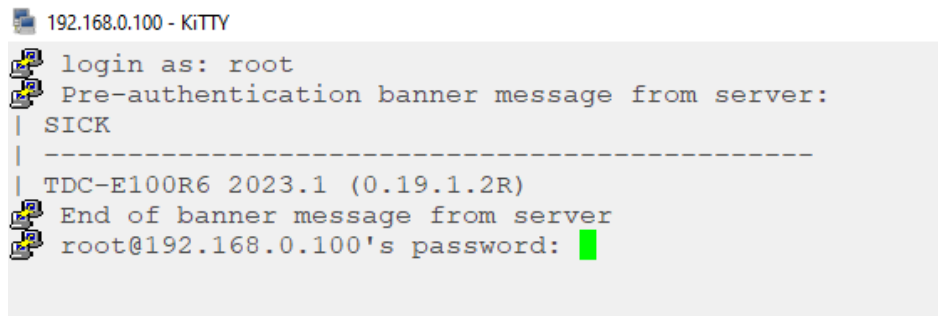


Image 10: SSH Kitty configuration

By clicking on the „Open“ button, a console window must open with login prompt of the TDC-E as show in the image below. The credentials are not a part of this guide and should be acquired separately.



```
192.168.0.100 - KiTTY
login as: root
Pre-authentication banner message from server:
| SICK
| -----
| TDC-E100R6 2023.1 (0.19.1.2R)
End of banner message from server
root@192.168.0.100's password: █
```

*Image 11: TDC-E SSH console login prompt*

## 4. NodeRed crash/restart loop fix

Some users experienced a problem where a NodeRed flow they created had an issue which caused NodeRed container to end in infinite restart loop because of the faulty flow. The following steps will show one way of resolving this issue.

### 4.1. Find file location on TDC-E where NodeRed flows are stored

Using Portainer tool, navigate to Volumes, and check the list to see which volume is used by NodeRed container. The entry would look similar to the one shown in the image below.

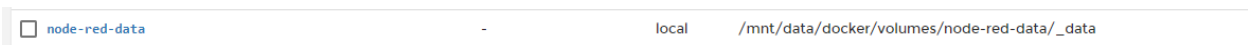


Image 12: NodeRed volume location on TDC-E file system

This path that is displayed is the path on the TDC-E file system where NodeRed flows are stored. This location can be accessed through SSH access. To get SSH access check out [Connecting to TDC-E via SSH over LAN](#)

### Stop the container

Navigate to Containers menu item in Portainer and STOP your NodeRed container as shown in the image below.

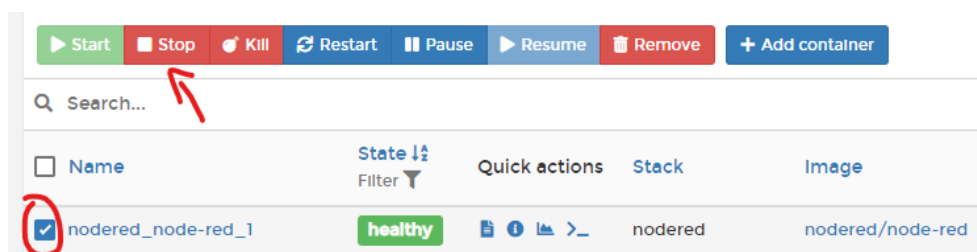


Image 13: Stopping a container

### 4.2. Navigate TDC-E file system using WinSCP

To show another option of navigating the TDC-E file system in a graphical way, users can use WinSCP tool downloadable from the Internet.

Once WinSCP tool is installed the connection to TDC-E is established very similarly as described in [Connecting to TDC-E via SSH over LAN](#). The screenshot below illustrates the connection parameters. Note that this assumes that LAN connection between work PC and TDC-E is viable.

Once the new configuration is entered and saved, it should be possible to click on the “Login” button as shown in the image and connect to TDC-E. **During the connection process, a password entry popup window can appear. There it is necessary to input the TDC-E root access password.** The password is not part of this guide and should be acquired separately.

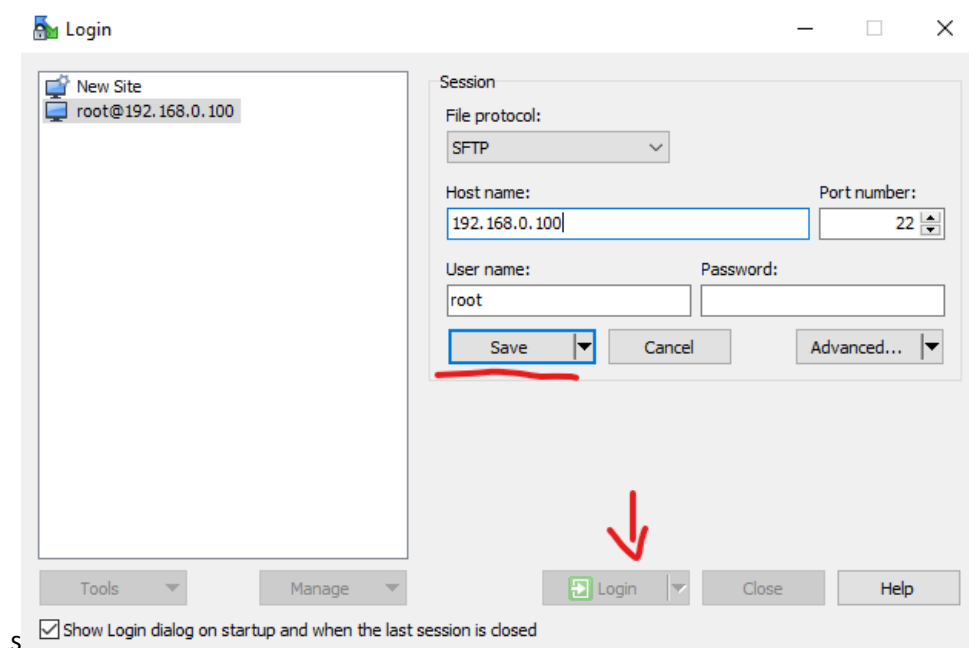


Image 14: Create WinSCP connection to TDC-E

When the connection is established the windows as shown in the image below should appear. The left hand side of the window shows a file system location in your work PC, and the right hand side shows the TDC-Es file system. This tool can then be used to transfer files back and forth.

#### 4.3. Manipulating flows.json file of NodeRed container

In the image shown below is the location of the NodeRed flows with the flows.json file marked with an arrow. To be safe, a user may want to copy this file to make a backup copy, possibly somewhere on the work PC.

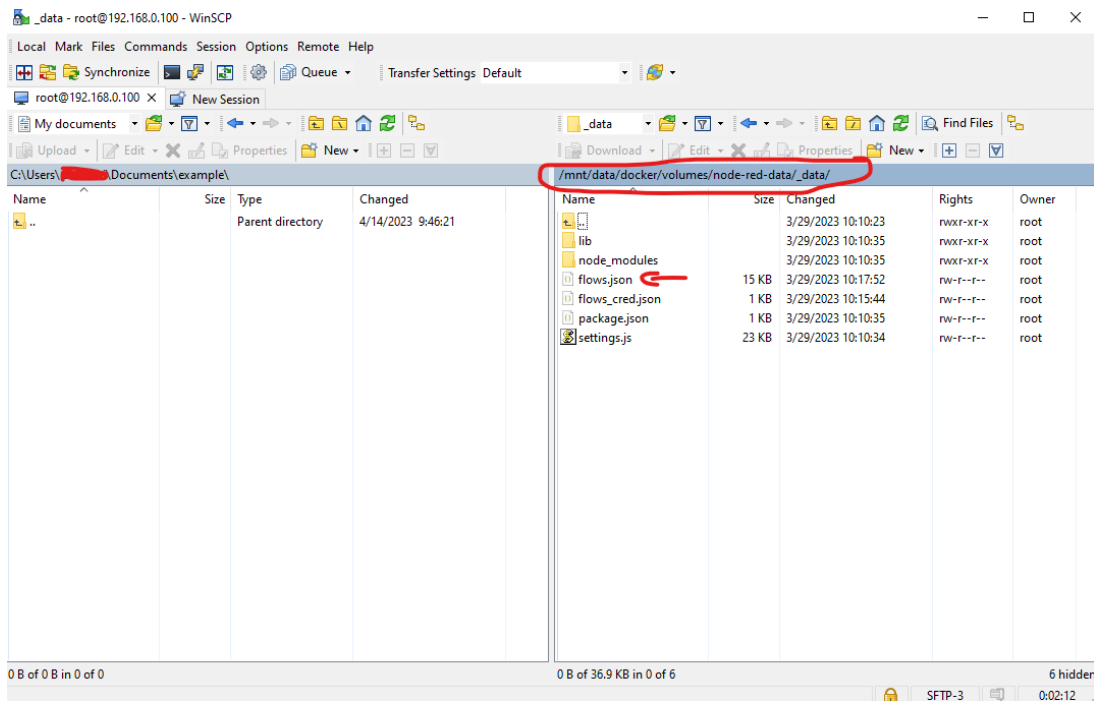


Image 15: WinSCP window with connection to TDC-E

The user can either edit this JSON file or delete the contents of, whatever is necessary to resolve the crash problem. Detailed solution cannot be provided as it depends on the nature of the problem with the flow, which may greatly vary.

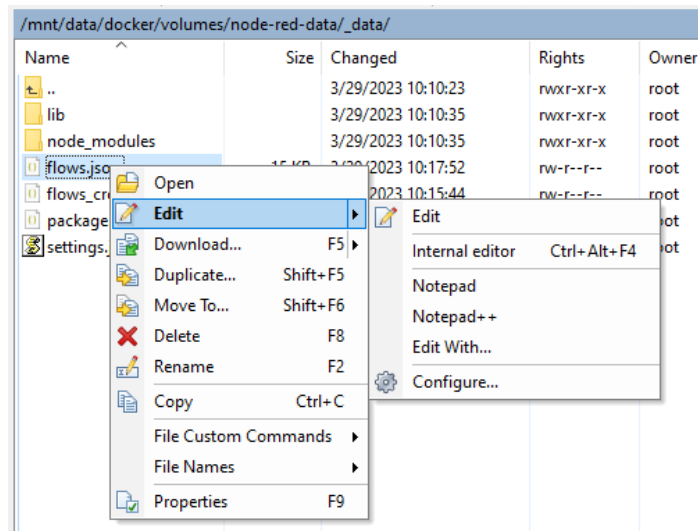


Image 16: Editing the flows.json using WinSCP

When the user is done with manipulating the file, the NodeRed container can be started again. **If the correction in the flows.json was successful, the container will no longer be in the crash/restart loop.**