Add gases to MFCs settings in Zilien

EC-MS Technical Note #13

last updated 28-04-2022

Introduction

The different options for gases that can be set for the mass flow controllers (MFCs) in Zilien are pre-set directly in the MFCs. The standard gases available when configured at Spectro Inlets are following 12 gases: He, Ar, N_2, H_2, O_2, CO, CO_2, D_2, CH_4, C_2H_6, CH_3OH and CH_3CH_2OH. If you want to add more options, it is therefore necessary to change those settings directly in the MFCs. The steps necessary for accessing those settings are explained in this Technical Note. A list of available gases can be found here: `https://www.mksinst.com/n/gas-code-table`.
Warning: Carrying out this procedure is at the users own risk.

How to

Required tools

You will need following tools:

- Philips screwdriver #1
- Ethernet cable
- Computer with available Ethernet port or Ethernet to USB converter

Access the MFCs

1. Before opening the EC-MS make sure the system is in safe state and close Zilien.
2. The EC-MS needs to be powered during this procedure. Warning: You are operating on a powered system! Take extra care and never use metal tools inside the EC-MS.
3. Unscrew the left side plate of the EC-MS (see Figure 1a). Start with bottom screws and unscrew middle top one last. Make sure to hold the plate in place.

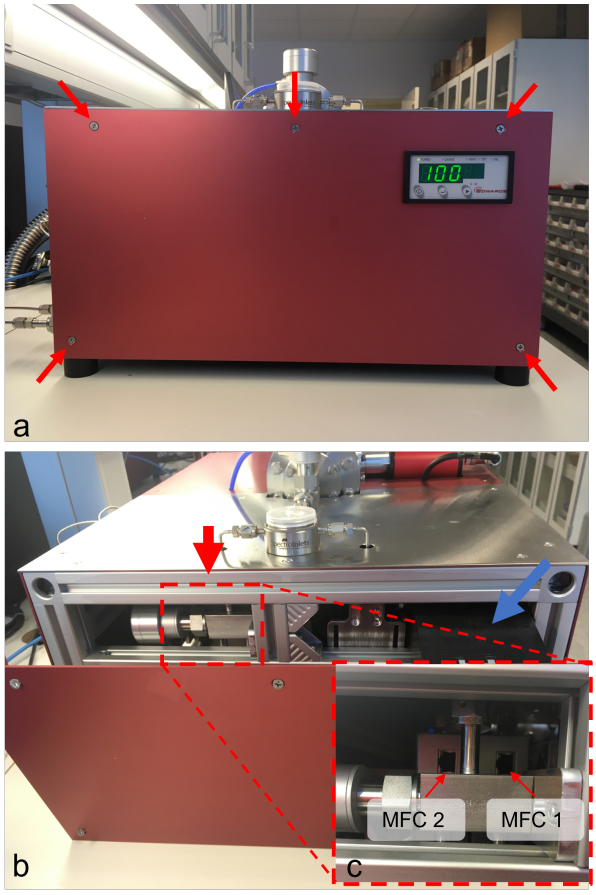


Figure 1: Access the MFCs in the EC-MS. See text for details.

4. Carefully take off the loose plate. Note that the pump electronics are mounted to the plate (see Figure 1b, blue arrow). Do not pull further if you feel resistance as this could damage internal cables. Place the plate on the table, while still hanging to the rest of the system (see Figure 1b).

5. Insert the Ethernet cable in one of the MFCs (Figure 1c) Note that it can be tricky to remove the Ethernet cable again after completing the configuration due to the narrow space inside the EC-MS. We recommend to break off the Ethernet lock clip before inserting it into the MFC.

Configure the MFCs

The MFCs built into the EC-MS are pre-calibrated with a set of gas constants that can be used. In order to use the pre-calibrated constants, the MFC needs to be configured as described in the following:

1. Connect the MFCs to a computer via the Ethernet cable.

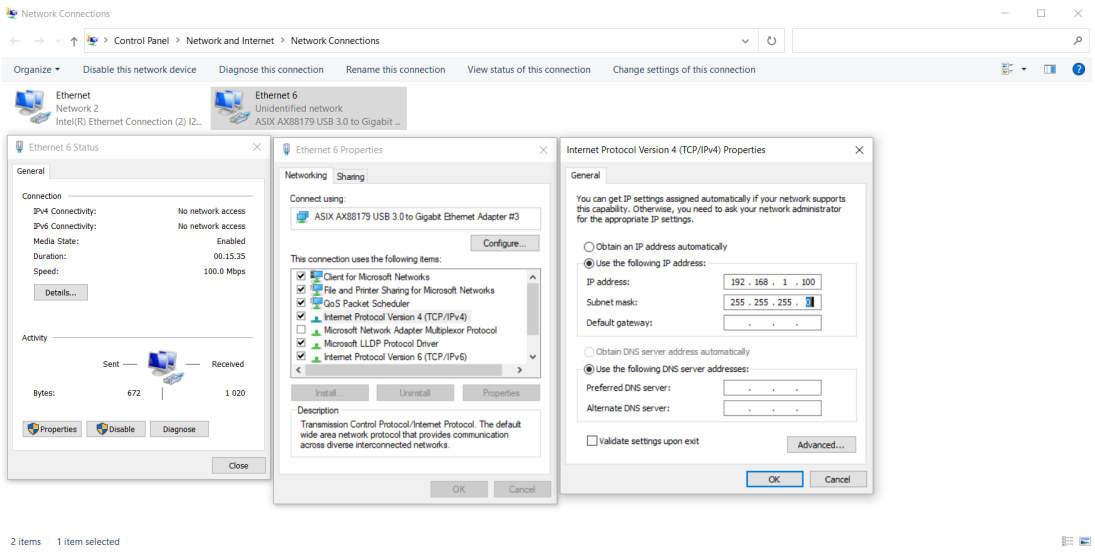


Figure 2: Configure static IP address in Windows Control Panel: Double click on the Ethernet connection to open the "Status" window, go to "Properties", select "Internet Protocol Version 4 (TCP/IPv4) and go to "Properties". Change the static IP-address to 192.168.2.100, sub-net mask 255.255.255.0.

2. Open the device configuration page in a browser: Upon connection the device should be available on the IP address 192.168.2.155 (see Figure 3).
3. If this is not the case, identify the adapter among the network adapters (unplug and plug, make sure you don't accidentally change the IP-address of the EC-MS connection) and configure it for static IPv4 on the correct subnet: IP-address 192.168.2.100, sub-net mask 255.255.255.0. (see Figure 2)
4. Go to "change mode", password for change mode is "config" (Figure 3)
5. Go to the "Device" tab to configure gasses (Figure 4)
6. The gasses are added by going to the "Create a gas" section. Select the desired gas and instance (which is the number the gas should have in the configuration and hit submit. (Note: The changes can take a bit of time to take effect. Watch the status line of the browser, it will say something like: "Waiting for 192.168.2.155". When it is done reload the page. Now the newly configured gas will be visible in the "Selected Gas" dropdown, in the "Gas Settings" box.)

Finish

1. Remove the Ethernet cable carefully. Note this can be quite challenging.
2. Repeat the procedure for the other MFC if required.
3. Carefully insert the pump electronics and screw the plate back on.
4. Finally, open Zilien. The added gases will automatically be loaded into the drop-down menu in Zilien when starting the software.

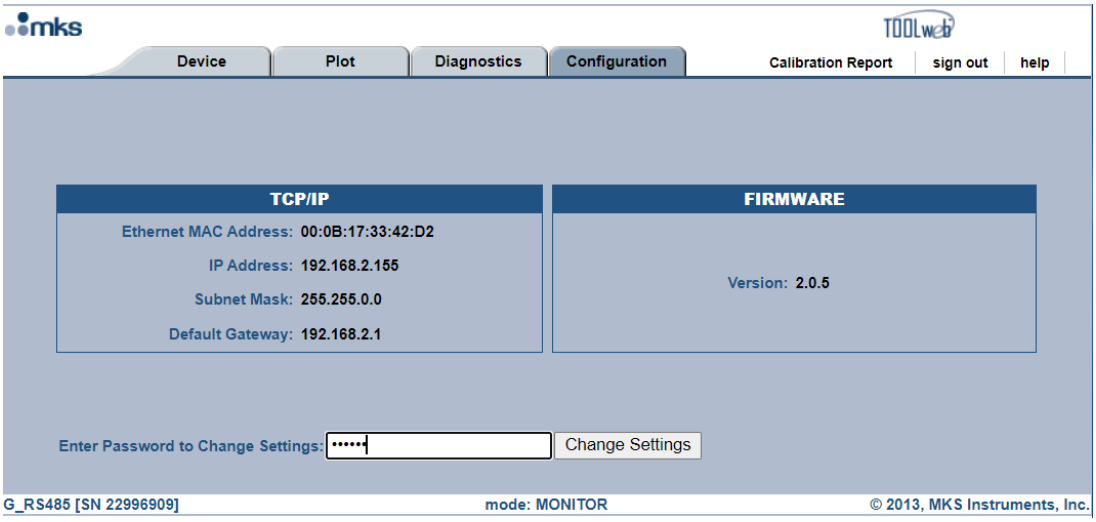


Figure 3: MFC configuration page loaded in a browser. Log into "change mode": Enter the password "config" at the bottom of panel "Configuration" and click "Change Settings".

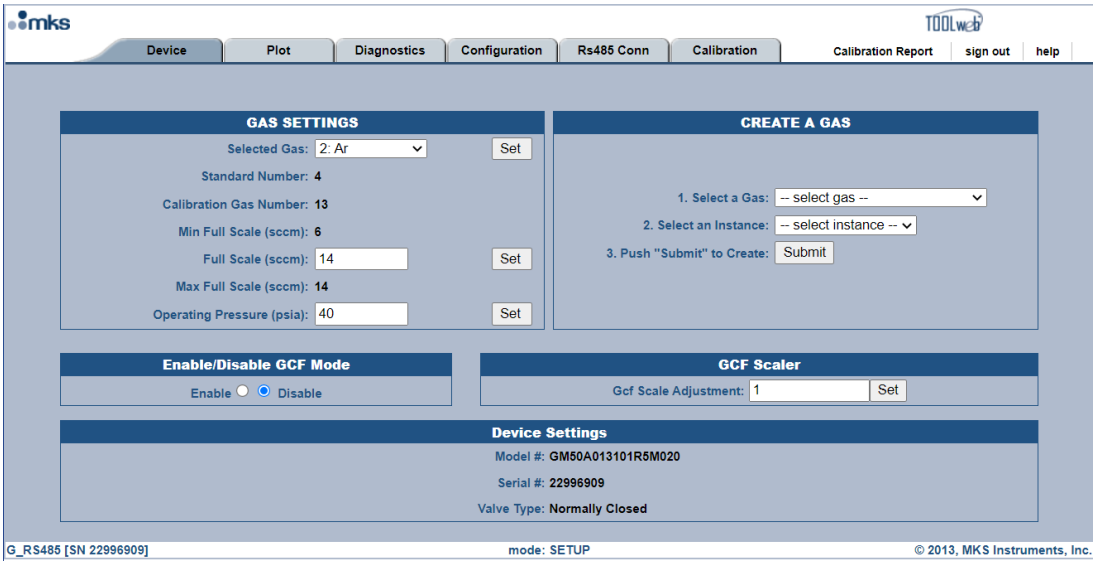


Figure 4: Device configuration: Add a gas to the MFC by selecting gas and instance in the section "Create a gas". In the dropdown menu "1. Select a Gas" you can choose from a wide range of gases pre-calibrated by the manufacturer.