

## Do you know how USB is working? Yes, it's complicated!

USB is a serial form of communication that is hot plugable and everything is done automatically – just magic. It is working in that way that each Vendor got his Vendor\_id at the USB Committee for an annual fee of US\$ 5000.-, then he creates his Model\_id for each product he is producing and a serial\_id for each unit. So, each unit has unique id's, as soon the computer has recognized it, the computer knows what it is and will find it again on the different USB ports. That's the theory; in practice, small companies and startups cannot or don't want to handle this US\$5000.- yearly fee. They are using internally a USB to serial chip and use the Vendor\_id and the Model\_id of the chip producer. Now the situation happens that the miniGC and the MA350 black carbon analyzer are using chips of the same brand with the same Vendor\_id and model\_id, so from the view of the airpointer PC both are the same thing and LinLog tries to talk with the miniGC and blocks the port for LinSens. Luckily they have a difference in the model\_name and now we are using this information and can handle these units correctly.

### What can you do?

First make sure your software version is newer then 26.June 2019. In case you are using a miniGC together with another USB device (USB modem is no problem) change the flag `only_miniGC_is_on_USB` to off.

The screenshot shows the 'airpointer' web interface for 'Configuration - miniGC'. The 'Main Configuration' section contains the following settings:

- miniGC Serial** [string]: PYB002919
- miniGC\_IP**: 192.168.20.86
- miniGC\_Intern** [on/off]: On
- only\_miniGC\_is\_on\_USB** [on/off]: Off (highlighted with a red circle)
- miniGC\_USB\_serial\_short**: (empty field)

The 'Calibration Factors' section shows:

- MiniGC\_Gas\_1\_FactoryCalFactor**: 0.2 [0.001 ≤ value ≤ ]
- MiniGC\_Gas\_2\_FactoryCalFactor**: 0.05 [0.001 ≤ value ≤ ]
- MiniGC\_Gas\_3\_FactoryCalFactor**: 0.07 [0.001 ≤ value ≤ ]

Make sure only the miniGC USB connector is in and restart LinSens in Service manager or reboot. After that you can see the USB serial of the miniGC is stored in the database and you also have a display in the service interface:

LinSens Service Interface [201800648], normal Operation

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**Actual Values MiniGC 1 SN:PYB002919** [Diagram](#)  
no calibration active

Parameter	Value	Unit	Status: BS-FS-SS
Benzene	0.36	ppb	0 0 0
Toluene	0.16	ppb	0 0 0
Ethylbenzene	-0.05	ppb	0 0 0
Xylene	-1.10	ppb	0 0 0

Benzene_all	0.36	ppb
Toluene_all	0.16	ppb
Ethylbenzene_all	-0.05	ppb
Xylene_all	-1.10	ppb
Benzene_peak_height	1.6	mV
Toluene_peak_height	3.7	mV
Ethylbenzene_peak_heig	0.8	mV
Xylene_peak_height	0.3	mV
Benzene_baseline	237.4	mV
Toluene_baseline	237.2	mV
Ethylbenzene_baseline	237.4	mV
Xylene_baseline	236.1	mV

SampleFlow	351.8	ml/min	SensorFlow	7.8	ml/min
SamplePress	926.0	mbar	SampleTemp	27.2	°C
ParaT	50.0	%	PowerToPerm	45.1	%

USB Interface: /dev/ttyUSB1 (Interface in startfile: /dev/ttyUSB1), USB serial: AL034XUF

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Plug in other USB connector(s) again.

To make life a little easier I added a display of the connected ttyUSB device to the LinLog service interface. In this example you see a miniGC connected to ttyUSB1 and a MA350 connected to ttyUSB0.

**LinLog Service Interface,**

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**List of USB devices**

Device name	Vendor	Vendor ID	Model	Model ID	Serial	Serial Short
ttyUSB1	FTDI	0403	FT232R_USB_UART	6001	FTDI_FT232R_USB_UART_AL034XUF	AL034XUF
ttyUSB0	FTDI	0403	TTL232RG-VSW3V3	6001	FTDI_TTL232RG-VSW3V3_FT1G2FVJ	FT1G2FVJ

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Additionally you can define the USB serial\_short (FT1G2FVJ in the example) in the LinLog Configuration, Group Setup Step2, with this definition the USB serial is fixed to this group:

