

MAVOMASTER & MAVOPROBE SDK

1.0/11.22



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1 Introduction

The USB-Interface of the GOSSEN MAVOMASTER is a so called “USB composite device”. Meaning, that the device provides more than one interface functions with one connection.

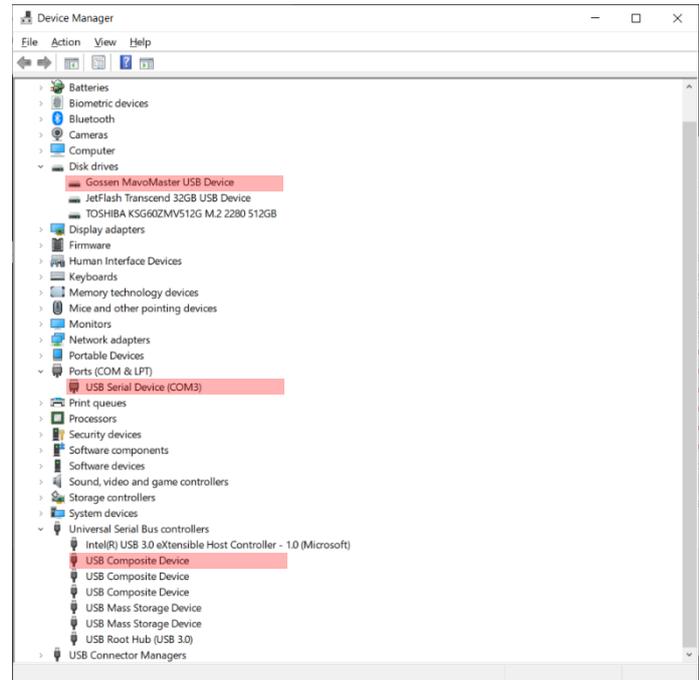
If the device is connected to your computer it will register as a disc drive as well as a CDC (**C**ommunications **D**evice **C**lass aka Serial Connection). The disc drive is for loading the saved measurements and the CDC for remote controlling the device and getting measured data.

The USB-Interface of the GOSSEN MAVOPROBE is only CDC, so you will not see a USB Device or a Composite Device.

For Windows 10 no special drivers are needed as all necessary drivers are included in your operating system and are installed automatically when the device is connected to the PC for the first time.

If you are running Windows 8.1 / 8 or 7 you might need a driver to use the CDC-Interface (Serial Port). You can download this driver (*.inf – File) from our Homepage.

If you are still running Microsoft XP (you poor lad), the disc drive should work. The CDC might(?) work if you find drivers for it (we will not provide them, sorry).



Picture 1: Device Manager with a connected MAVOMASTER

2 Quick Start

2.1 ZIP-Archive contents

In this ZIP-Archive you find the following files:

- MavoMASTER & MavoPROBE SDK Manual.pdf this file
- MavoMASTER CDC demo.xlsm usage example in MS Excel for MAVOMASTER
- MavoPROBE CDC demo.xlsm usage example in MS Excel for MAVOPROBE
- MavoMASTER CDC Driver.inf the INF-File for Windows 7 / 8 / 8.1 (CDC-Driver)
- mavoSOFT virtualMASTER demo.exe A demo Program for the Communication
- mavoSOFT virtualMASTER demo.zip The Visual Studio (2019) Project with the Source Code for the demo Program

If you are missing a file, please download the archive again from <https://gossen-photo.de/mavomaster/> and if the problem persists please contact us via email to info@gossen-photo.de.

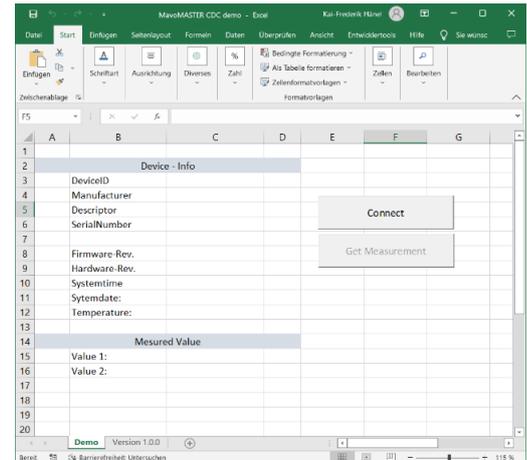
2.2 Usage of the Excel Sheets

Some of the used functions are not available in Excel for MAC so it will not work on a MAC.

In this Sheet are Buttons for connecting to the MAVOMASTER / MAVOPROBE ("Connect") and for taking measurements ("Get Measurement").

After connecting to a device, you can take a measurement. The measured values will be displayed on the first Sheet.

All VBA Macros and Functions are available for reading and editing and are commented.



Picture 2: Excel Sheet for taking measurements

3 Serial Connection

3.1 CDC Protocol

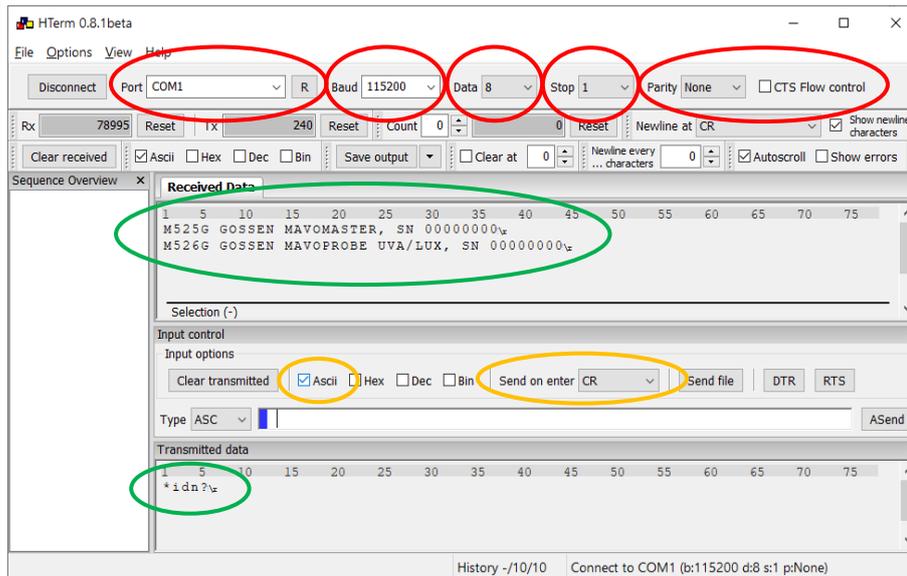
The UART Settings for the Device are: 9600 Bit per Second, 8 Data bits, 1 Stop bits (no parity, no Flow control)

To check that the serial communication works correctly you can try sending a command to the device with a Terminal-Program. We recommend [HTerm](#) from [der-Hammer.info](#). You can also use a different Terminal-Program that supports sending of several ASCII-Characters in one package.

Make all necessary settings in the Terminal-Program (red Circle). The commands are sent as ASCII and are terminated with either "line feed", "carriage return" or "carriage return - line feed" (yellow circle). The device will reply with the termination characters it received.

Additional information: CDC commands are not case sensitive, white spaces have to be placed where necessary.

If you send „*idn?“ to the device, the device (MAVOMASTER) should answer as shown in the screenshot (green circle).

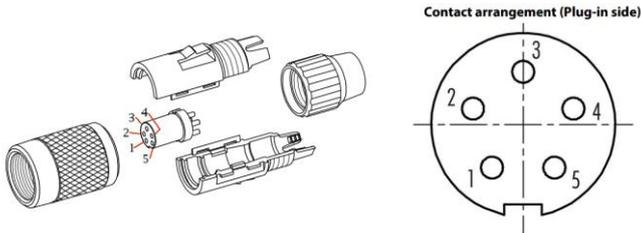


3.2 Connecting the MAVOPROBE to a PC

To connect the MAVOPROBE to a PC you need a special adapter cable. You can purchase a cable from us directly with your MAVOPROBE or order one as an accessory. The adapter cable has the Number V074A.

Alternatively, you can build the cable yourself.

The connector used in the adapter cable is a "Binder series 711 plug, 5-pin, female". The USB-Side is a standard USB-A Connector.



Connect the USB cable like this:

- 1 +5V (Red)
- 2 0V (Black)
- 3 0V (Black)
- 4 Data (White)
- 5 Data (Green)

Bridge Pins 2 and 3.

4 Command Descriptions

4.1 Command Overview

CDC Command	Master or Probe	Short Command Description
*idn?	Master & Probe	Get Device Identification
fw?	Master & Probe	Get Firmware Revision
hw?	Master & Probe	Get Hardware Revision
temp?	Master & Probe	Get Probe Temperature (if connected to the Master)
?	Master & Probe	Get last Measurement
mea?	Master & Probe	Get last Measurement
measure?	Master & Probe	Get last Measurement
datetime?	Master	Get the Time and Date in the Device
datetime	Master	Set the Time and Date in the Device
backlight?	Master	Get the Backlight level
backlight	Master	Set the Backlight level
settings?	Master	Get all Device Settings
settings	Master	Set a Device Setting
factorysettings	Master	Reset the Settings to Factory default
savesettings	Master	Save the changed Settings
beep	Master	Make a Sound
keylock	Master	Lock the Keys on the Device
keycode	Master	Simulate pressing a Key
batvoltage?	Master	Get the Voltage Level of the Battery
range	Probe	Set the Measuring Range to a fixed Range
autorange	Probe	Activate Auto-Ranging
bootloader	Probe	Start the Device in Bootloader-Mode

4.2 MASTER & PROBE

4.2.1 Get Device Information

Command to Send:	*idn?
Received Command:	as Master: Identification of the Master and Identification of the connected Probe as Probe: Identification of the Probe

4.2.2 Get Firmware Revision

Command to Send:	fw?
Received Command:	The Firmware Revision: x.y.z

4.2.3 Get Hardware Revision

Command to Send:	hw?
Received Command:	The Hardware Revision: xx

4.2.4 Get Probe Temperature

Command to Send:	temp?
Received Command:	as Master: The Temperature in °C or °F as set in the Settings as Probe: The Temperature in °C

4.2.5 Get Measurement

Command to Send:	? mea? measure?
Received Command:	The measured Value(s) with Unit. "834.3 lx – 9860 W/m ² " for MAVOPROBE LUX/UVA "8084 cd/m ² " for MAVOPROBE MONITOR

4.3 MASTER

4.3.1 Get the Time and Date

Command to Send:	datetime?
Received Command:	The Time and Date currently set in the Device "Time:05:20 Date:01.01.2022"

4.3.2 Set the Time and Date

Command to Send:	datetime HH MM DD MM YYYY HH: Hour MM: Minutes DD: Day MM: Month YYYY: Year
Received Command:	The Time and Date that was set in the Device "Time:05:20 Date:01.01.2022"

4.3.3 Get the Backlight level

Command to Send:	backlight?
Received Command:	The Value of the Backlight in %

4.3.4 Set the Backlight level

Command to Send:	backlight XXX XXX: the level in % (0-100)
Received Command:	"Backlight:XXX"

4.3.5 Get all Device Settings

Command to Send: settings?

Received Command: All settable Device Settings (one Line per Setting)

“Language”: 0 = English | 1 = German

“LCD Illumination”: 0 = off | 1 = always on | 2 = on Hold | 3 = automatic

“LCD Brightness”: Brightness in % (0-100)

“Auto Shutdown”: 0 = off | Number in Seconds till Shutdown

“Units Metric”: 0 = Imperial | 1 = Metric

“Irradiance cm2”: 0 = W/m² | 1 = W/cm²

“Function Key1”: 0 = none | 1 = relative | 2 = integral | 3 = grid |
4 = A/B | 5 = %A | 6 = A-B | 7 = Logger

“Function Key2”: see above

“Log Interval”: Number in Seconds (max. 24 hours)

“Filename”: 0 = Time | 1 = ongoing Number

“Decimal Sperator”: 0 = Dot | 1 = Comma

“Time Format”: 0 = 24h | 1 = 12h

“Date Format”: 0 = dd.mm.yyy | 1 = mm/dd/yyyy | 2 = yyyy/mm/dd

4.3.6 Set a Device Setting

Command to Send:	settings XX YY...	
	Setting XX:	Value YY:
	1 = "Language"	0 = English 1 = German
	2 = "LCD Illumination"	0 = off 1 = always on 2 = on Hold 3 = automatic
	3 = "LCD Brighthness"	Brightness in % (0-100)
	4 = "Auto Shutdown"	0 = off Number in Seconds till Shutdown
	5 = "Units Metric"	0 = Imperial 1 = Metric
	6 = "Irradiance cm2"	0 = W/m ² 1 = W/cm ²
	7 = "Function Key1"	0 = none 1 = relative 2 = integral 3 = grid
		4 = A/B 5 = %A 6 = A-B 7 = Logger
	8 = "Function Key2"	see above
	9 = "Log Interval"	Number in Seconds (max. 24 hours)
	10 = "Filename"	0 = Time 1 = ongoing Number
	11 = "Decimal Sperator"	0 = Dot 1 = Comma
	12 = "Time Format"	0 = 24h 1 = 12h
	13 = "Date Format"	0 = dd.mm.yyy 1 = mm/dd/yyyy 2 = yyyy/mm/dd
Received Command:	"Settings: XX to Value: YY"	

4.3.7 Reset the Settings to Factory default

Command to Send:	factorysettings
Received Command:	"Set Settings to Default"

4.3.8 Save the changed Settings

Command to Send:	savesettings
Received Command:	"savesettings"

4.3.9 Make a Sound

Command to Send: `beep X`
0 = short beep
1 = very short beep
2 = long beep
3 = error beep (3 short beeps)

Received Command: `"beep X"`

4.3.10 Lock the Keys on the Device

Command to Send: `keylock X`
0 = disabled (false)
1 = enabled (true)

Received Command: `"keylock true"` or `"keylock false"`

4.3.11 Simulate pressing a Key

Command to Send: `keycode XX`
LL = Left Lower
LU = Left Upper
ML = Middle Lower
MU = Middle Upper
RL = Right Lower
RU = Right Upper

Received Command: `"keycode XX"`

4.3.12 Get the Voltage Level of the Battery

Command to Send: batvoltage?

Received Command: "XXXX": The Voltage Level in mV

4.4 PROBE

4.4.1 Set the Measuring Range to a fixed Range

Command to Send: **range X Y**
 X = (1 to 5) Range for Channel 1 (Lux, cd/m²)
 Y = (1 to 5) Range for Channel 2 (W/m², W/cm²) only for UVA/Lux Probe

You **have** to send both ranges for all Probes, you can send a "1" for Channel 2 for Lux Probes. Fixed ranges only work with auto-ranging off, see command below.

Received Command: "Range set to X Y"

4.4.2 Activate Auto-Ranging

Command to Send: **autorange X**
 0 = false, no auto-ranging (use command above to set a fixed range)
 1 = true, auto-ranging enabled
 You have to send both ranges for all Probes, you can send a "1" for Channel 2 for Lux Probes

Received Command: "Autorange true" or "Autorange false"

4.4.3 Start the Device in Bootloader-Mode

Command to Send: **bootloader**
 The Device restarts in Bootloader-Mode without a comment.

Received Command: none

Document Revision History

Version	Date	Creator	Short Description
V 1.0	16.02.2017	HK	First Revision