

MikroKopter LiveView

Documentation

General

MK-LiveView was created with the intention to show relevant telemetry data of the copter clear on the screen.

The data is send by a serial connection between the debug port of the copter and the pc.

The programm is optimized for use with the Navi-Ctrl but can also be used to show data from the Flight-Ctrl alone.

At the time of creation the firmware of the copter used was:

Flight-Ctrl: V2.14c

Navi-Ctrl: V2.14e

BL-Ctrl: V1.10

The software was tested with the following hardware:

Flight-Ctrl: V2.2 (V2.1 with ACC upgrade)

Navi-Ctrl: V2.0

BL-Ctrl: V3.0

The programm was created with VisualStudio 2015 in C# .

The „MikroKopter Serial Control Tutorial“ (<http://hdl.lib.byu.edu/1877/2747>) by John C. Macdonald has contributed essentially for the implementation oft he programm. He created a C#-project for controlling a MikroKopter by PC.

Visualisation and operation

The screenshot displays the MikroKopter LiveView interface with the following data:

- Telemetry Data:** Voltage 14,6 V, Current 0,5 A, Capacity used 6 mAh, Flying time 00:00:00, RC quality 200, Magnetic field 98%, Satellites 0, GPS-Position (Long: 12,143961°, Lat: 48,523184°).
- Motors Table:**

#	Current	Temp	#	Current	Temp
1	0,0 A	25 °C	5	NA	NA
2	0,0 A	25 °C	6	NA	NA
3	0,0 A	25 °C	7	NA	NA
4	0,0 A	24 °C	8	NA	NA
- Flight Parameters:** Ground Speed 0,00 m/s, Altitude 0,5 m, Distance (HP) 0,1 m, Distance (WP) 0,0 m, Waypoint list (act. index 0, count 0).
- OSD Display:** + Navi-Ctrl (M) +[0], HW V2.0 SW V2.14e, Set:4 Test, No Error.
- Compass:** Shows heading 218°.
- Altitude Graph:** Shows current altitude 0,4° and target altitude -1,1°.
- Bottom Bar:** HW V2.0, SW V2.14e, BL-Firmware: V1.10, Controller NC, Communication CRC-Error 0, close serial port, stop automatic data refresh.

The start window in the tab “Visual” shows the telemetry data.

In case there is no NC available or the active controller is the FC the non available data is shown as “NA”

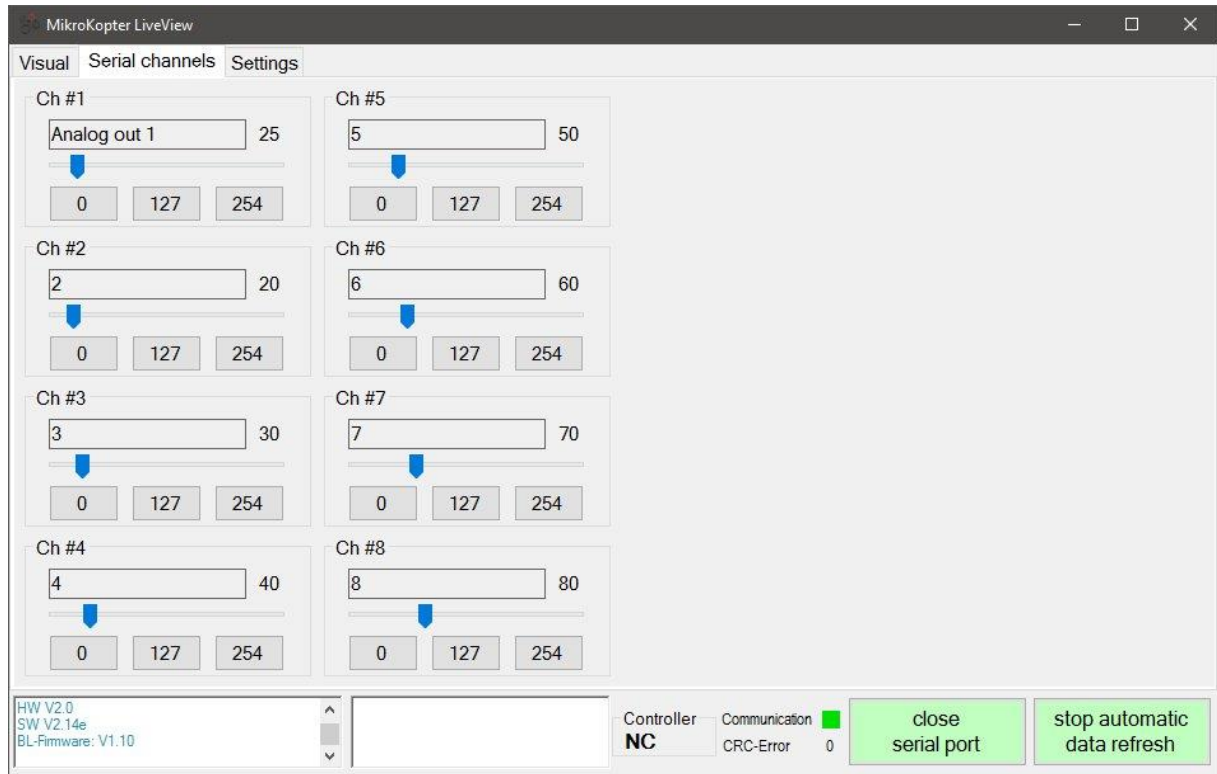
At moment, the currents and temperatures of the motors can only be read from the Nav-Ctrl. (I made an extension for the FC-source to enable this also for the FC. Maybe it will be integrated with the next FW update...)

In the lower bar on the left is a log window for general messages of the copter control and the programm. In the window next to it error messages will be displayed.

With the button open / close serial port the serial com-port will be opened / closed. When opened you can start the automatic cyclic request for data from the copter with the button on the very right. (The data to be send is set in the settings tab.)

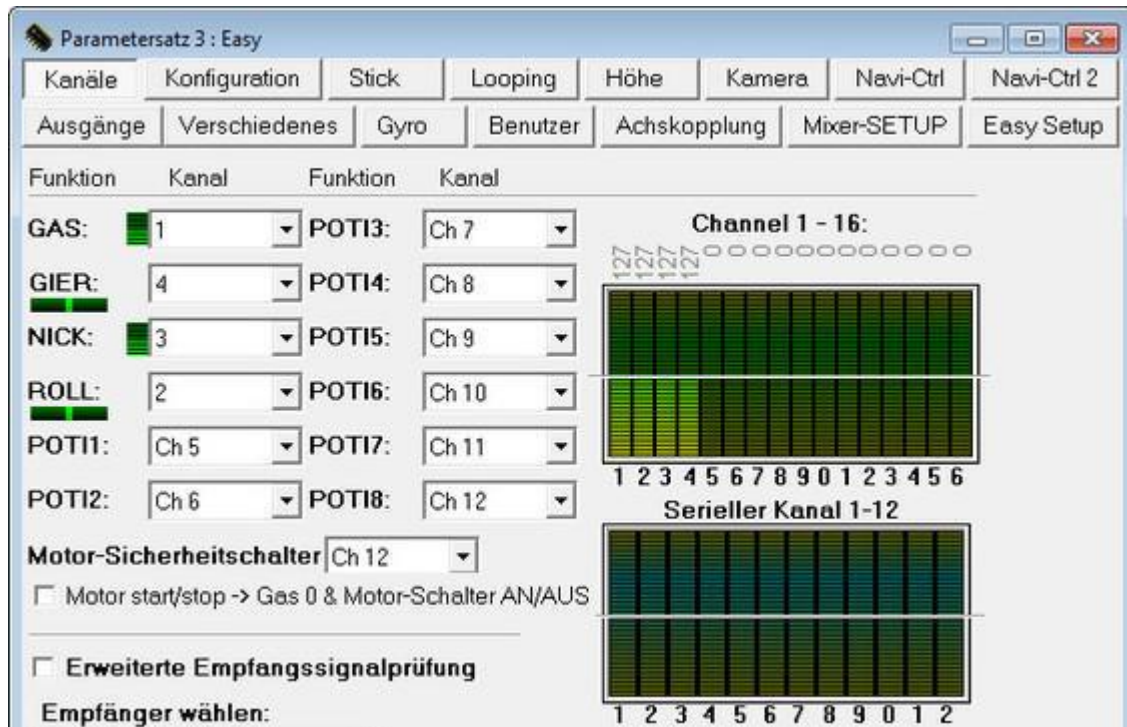
In the upper window You also find a OSD ‘display’ which is equal to the display in MK-Tool. You can scroll through the pages with the arrow buttons or jump directly to a page with the dropdown menu.

With the buttons below You can activate functions when available (e.g calibration...).



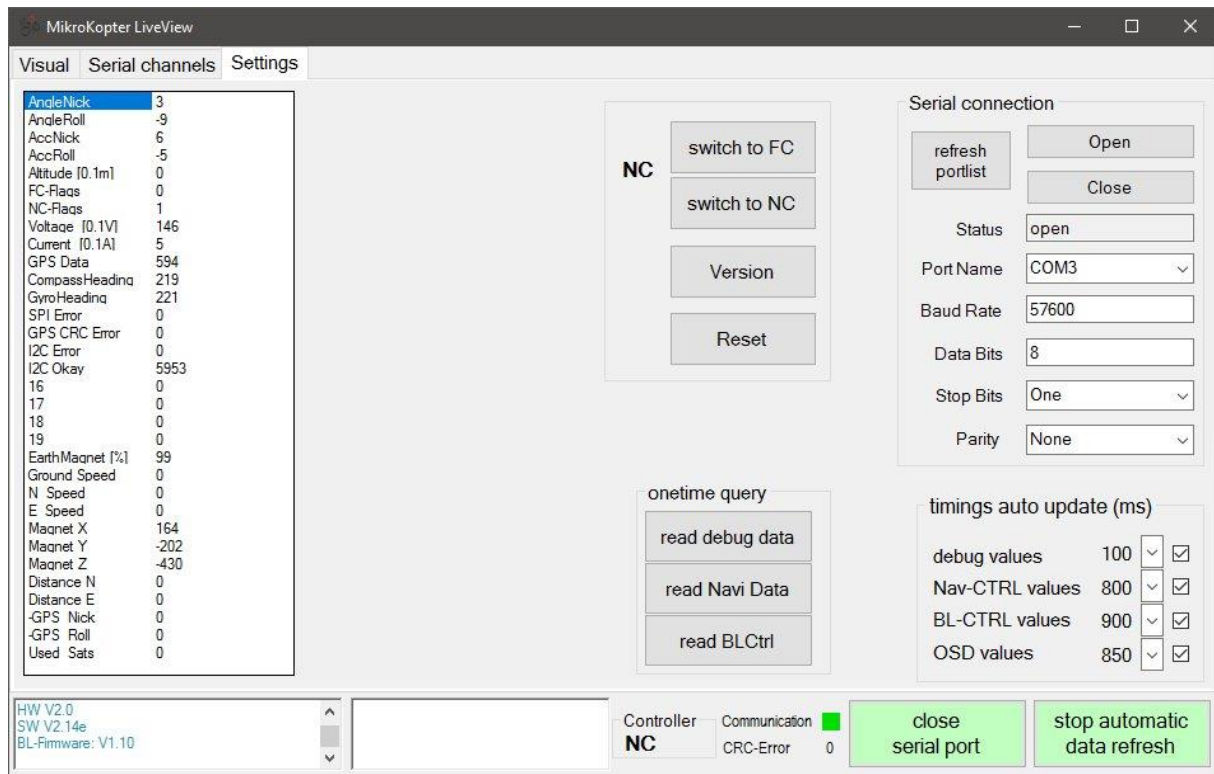
On the page ‚Serial Channels‘ You have access to 8 serial channels as an addition to the normal control channels of the RC.

In order to control functions You have to set up the assignment of the serial channels in the MK-Tool. Normally You assign them to any of the pots on channel page:



There are also other possibilities to assign the channels to – just look and see...

An applicability would be to set the timing of the analog output, e.g.



On the settings page one can make adjustments to the serial connection settings and the timings for the data update rate.

In the left table all analog data of the active controller is displayed.

Adjustments in the serial connection settings should be only done to the serial com-port. All other settings are set to the definitions of the copter control port.

With the button 'refresh portlist' one may update the list of com-port interfaces in case a new device has been attached after the start of the programm. (so You don't need to restart the programm...)

The timings for auto update adjust the rates for the cyclic data update sent by the copter. With the checkboxes one may dis/enable the request for certain values.

One should be careful with the timings as too short intervals may unnecessarily utilize the processor of the copter. Also huge datapackets like the Nav-Ctrl datastruct may unnecessarily block the dataflow.

Nevertheless one should try it oneself as it also may be dependent on the own pc on how fast the received data is processed and displayed.

➔ For a fluid display of the compass and the artificial horizon the timing of the debug values should be set to 100 ms.

The buttons switch to FC/NC change the active controller the data is received from.

I didn't test this during flight – it could be that the copter may not react 'friendly' on this – so be careful.

With 'Reset' the controller is rebooting – as far as I know this is not accessible during flight - but I would not let it come down to a test...

Others

Additional Software:

„**Avionic Instrument Controls**“ from Chootair

(<http://www.codeproject.com/Articles/27411/C-Avionic-Instrument-Controls>)

I took the code snippet for the animation of the compass from there – the compass itself was built by google search and gimp ☺

„**Artificial horizon**“ from Tom Pycke (<http://tom.pycke.be/mav/100/artificial-horizon>)

Great job!

And of course parts of the sources from the „**Mikrokopter Serial Control Tutorial**“

(<http://hdl.lib.byu.edu/1877/2748>)