Using hardware buttons and LCD

It is possible to connect 4 buttons ('+', '-', 'E' and 'C') directly to the Spinning Globe board PCB, as well as a 16 x 2 character, Arduino compatible LCD display.

This allows you to review the same live values and change the same settings as by using the serial monitor.

The LCD displays status information on the top line (e.g. "E! dropped globe") and the currently selected parameter (see section "Serial communication") on the bottom line.

Note that led strip settings cannot be changed using the hardware buttons. They are not displayed on the LCD either.

Connecting ('make' contact) buttons: use connector SV2.

- '-' button: connect one pin to signal 'SW0' (SV2 pin 2), other pin to GND
- '+' button: connect one pin to signal 'SW1' (SV2 pin 4), other pin to GND
- 'E' button: connect one pin to signal 'SW2' (SV2 pin 6), other pin to GND
- 'C' button: connect one pin to signal 'SW3' (SV2 pin 8), other pin to GND

Pressing these buttons will have the same effect as sending the equivalent commands using the serial monitor (or other terminal software).

Important: make sure DIP switches 2 to 5 are all in the OFF position. These switches are connected to signals 'SW3' to 'SW0', respectively, in parallel with these 4 buttons. Setting a switch in the ON position will tie the corresponding signal to GND, making the corresponding button inoperable. Moreover, if one of these switches is in the ON position right after reset or power on, the system enters programming mode.

Connecting an LCD: use general-purpose connector SV5 to connect an optional 2 x 16 character LCD based on the Hitachi LCD controller.

- Data is sent to the LCD using a 4-bit bus
- The LCD is working in write-only mode: wire the LCD Read/Write pin to ground
- Connect LCD data bits 4 to 7 pins to signals 'D4(PD4)' to 'D7(PD7)' (Arduino port D bits 4 to 7, see schematic)
- Connect the LCD RS (register select) pin to signal 'D3(PD3)' (port D bit 3)
- Connect the LCD enable pin to signal 'PB2' (Arduino port B bit 2)
- Properly connect power, LCD contrast and backlight LED pins (using resistors as specified in the LCD datasheet - resistors not provided on the PCB)