Phaenovum RaspiCar: Interface Board command list

SLW - November 2025

Interface description

The interface board is connected to the Raspberry Pi via USB port 0 (typically /dev/ttyUSB0). Communication is established by a serial interface at (baudrate 115200, no parity bit). The communication is bidirectional. The Raspberry Pi sends a command and receives a response. Blanks and white space are ignored. All commands must be terminated by a "carriage return" symbol (code 13, \n). The submitting script must wait for processing time (e.g. 0.1 seconds) before drawing the response. The submitting script may use the response to check whether the command was processed as expected. The default response is 'OK'.

The interface board constantly monitors the battery voltage. The Raspberry Pico processor is using one of its ADCs for measuring. The actual voltage is calculate using a linear function:

$$\text{<voltage>} = \text{<intercept>} + \text{<slope>} * \text{ADC raw data} / 10000$$

The actual settings for <intercept> and <slope> depend on the exact values of the corresponding resistors on the board. Therefore, the values can be set using the "Config" command as shown below. The values are stored in EEPROM memory. The software applies default values with reasonable estimates in case that no configuration has been made.

Motor commands:

- `MD <int>, <int>`
  Sets the direction for both motors. The value 1 stands for forward, and the value 0 for backwards.
  Example: `MD0,1`

- `ME <0 | 1>, <0 | 1>`
  Enables or disables the motors. The value 1 stands for enabled, and the value 0 for disabled.
  Example: `ME1,0`

- `MP <0 | 1>, <0 | 1>`
  Activates the motor power. The value 1 stands for power on, and the value 0 for power off. This command enables the motors implicitly.
  Example: `MP1,1`

- `MR <int>, <int>`
  Sets the motor speed. The valid range is 0 to 1250. The motor must be enabled and powered on in order to start rotation.
  Example: `MR200,500`

Display commands:

- `DC`
  Clears the display.
  Example: `DC`

- `DT <message>`
  Prints a title line. The maximum length is 20 characters.
  Example: `DTVersion2.1`

- `DM <message>`
  Prints a message to the display. The content of the display will be scrolled up.
  Example: `DMRaspPi connected`

Battery commands:

- `BV`
  Get battery voltage. The system will respond with the current voltage of the power supply.

- `BS`
  Get battery status. The system will respond with one of the following codes::
    - `'OK'` STATUS_OK
    - `'BL'` STATUS_BAT_LOW
    - `'BS'` STATUS_BAT_SHUTDOWN
    - `'BE'` STATUS_BAT_EXTERNAL
    - `'SR'` STATUS_SHUTDOWN_REQUESTED
    - `'SX'` STATUS_SHUTDOWN_ACTIVE
- `BR`
  Get batteryADC raw data.
- `BX`
  Request a system shutdown.

Info commands:
- `P`
  Just returns a prompt (OK)
- `I`
  Returns information and version number.

Get commands:
- `V`
  Returns the version number of the current firmware
- `I`

Config commands:
- `CG`
  Returns the current setting for the ramp.
- `CR <int>`
  Sets the motor ramp (valid range: 1 … 100, default: 12).
- `CS <int>`
  Sets the ADC voltage conversion slope (valid range: 300 … 450, default: 372).
- `CO <int>`
  Sets the ADC voltage conversion offset (valid range: 700 … 1000, default: 825).