Communication Protocol Manual

------Rev 0.1 Pride ES Controller
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Protocol Type: Single Line **UART**

Bit Order: Least Significant Bit First (LSB-First)

Baud Rate: 38400

Voltage Level: 3.3V

Data Bits: 8

Parity Check: Even

Stop Bit: 1

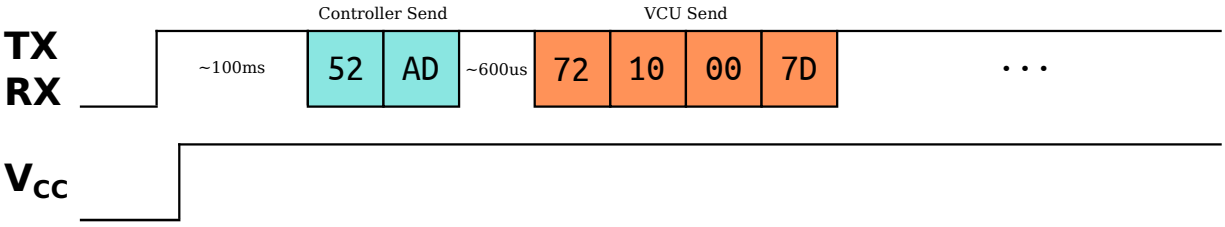
Yellow: V_{CC} +3.3V

White: TX/RX

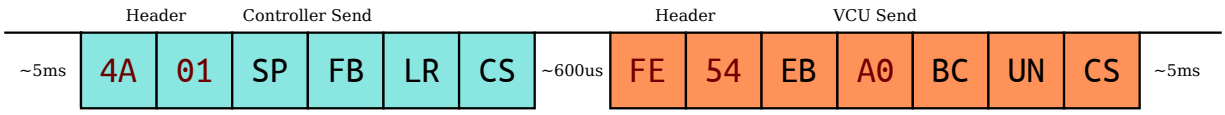
Black: GND 0V

Red: V_{SS} +24V

Power on Procedure:



Standard Messaging: (Every 5ms interval)



Headers are the identifiers of the message frames. `4A 01` for messages sent from the controller, `FE 54` for messages sent from the VCU.

SP: Speed Level Setting. Type: Unsigned Char Range: `0x00` (slowest) to `0x0E` (fastest).
FB: Go forward/backward. Type: Signed Char Range: `0x9C` (backward -100) to `0x64` (forward +100).
LR: Go left/right. Type: Signed Char Range: `0x9C` (left -100) to `0x64` (right +100).
EB: Error Byte. Type: Raw Byte Known Bytes: `0x82` Error | `0x02` Ready to Go.
BC: Battery Charge. Type: Unsigned Char Range: Unknown.
UN: Unknown Byte Type: Unknown Range: Unknown.
CS: Check Sum Byte Type: Raw Byte Range: `0x00-0xFF`

Check Sum Byte Calculation Rule:

1. Transform all preceeding bytes into signed char type.
2. Sum all signed chars.
3. Do a bitwise negation (~) on the sum to get **CS**.