Driver Controls CAN Communication Specification

Updated: 13 February 2016

**1 Heartbeat**

**ID**: 0x500

**Interval:** 1000 ms

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Bytes** | **Type** | **Description** |
| Serial number | 7…4 | UInt32 | Set to 0x0042 |
| ID | 3…0 | UInt32 | Set to 0x00C7 |

**2 Drive Command**

**ID**: 0x501

**Interval:** 150 ms

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Bytes** | **Type** | **Description** |
| Motor Current | 7…4 | Float | Ratio of current accelerator voltage to maximum voltage |
| Motor Velocity | 3…0 | UInt32 | 100 = forward, -100 = reversed, 0 = stop |

**3 Power Command**

**ID**: 0x502

**Interval:** 1000 ms

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Bytes** | **Type** | **Description** |
| Bus Current | 7…4 | Float | Set to 1 (i.e. 100%) |
| Unused | 3…0 | - | Set to 0 |

**4 Driver Controls Information**

**ID**: 0x505

**Interval:** 150 ms

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Bytes** | **Type** | **Description** |
| Unused | 7…6 | UInt16 | unused |
| Gear | 5 | UInt8 | 0x01 = REVERSE, 0x02 = FORWARD,  0x03 = NEUTRAL, 0x04 = BRAKE,  0x05 = REGEN |
| Overcurrent Count | 4 | UInt8 | Number of consecutive overcurrents (40-68 A) |
| Regen Pedal Ratio | 3 | UInt8 | Ratio of regen pedal voltage to max (%) |
| Accel Pedal Ratio | 2 | UInt8 | Ratio of accel pedal voltage to max (%) |
| Ignition Switch | 1…0 | UInt16 | Bit 8 (fuel door) is set to 1; bits 7…0 (ignition switch) are either 0x40 (ignition start) or 0x10 (ignition run) |

**5 Driver Controls Status**

**ID**: 0x506

**Interval:** 150 ms

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Bytes** | **Type** | **Description** | |
| Unused | 7…6 | UInt16 | unused | |
| Status Flags 2 | 5 | UInt8 | *Bits* | *Usage* |
| 7…3 | unused |
| 2 | 1 = cruise control on |
| 1 | 1 = left turn signal on |
| 0 | 1 = right turn signal on |
| Status Flags 1 | 4 | UInt8 | *Bits* | *Usage* |
| 7 | unused |
| 6 | 1 = cruise control off requested by SW |
| 5 | 1 = cruise control on requested by SW |
| 4 | 1 = hazards requested by SW |
| 3 | 1 = headlights requested by SW |
| 2 | 1 = left turn requested by SW |
| 1 | 1 = right turn requested by SW |
| 0 | 1 = horn requested by SW |
| Board Error Flags 2 | 3 | UInt8 | *Bits* | *Usage* |
| 7…0 | unused |
| Board Error Flags 1 | 2 | UInt8 | *Bits* | *Usage* |
| 7 | 1 = board was reset |
| 6 | 1 = MCP2515 was reset |
| 5 | 1 = detected overcurrent |
| 4 | 1 = received bad gear from steering wheel |
| 3 | 1 = telemetry timed out |
| 2 | 1 = steering wheel timed out |
| 1 | 1 = BMS timed out |
| 0 | 1 = motor controller timed out |
| CAN Error Flags | 1…0 | UInt16 | *Bits* | *Usage* |
| 15 | unused |
| 14 | 1 = high error count (TEC/REC > 96) |
| 13 | 1 = MCP2515 entered bus off |
| 12 | 1 = message transmission error |
| 11 | unused |
| 10 | 1 = local buffer full |
| 9 | 1 = failed to switch modes |
| 8 | 1 = failed to set baud rate |
| 7…3 | unused |
| 2 | 1 = empty interrupt |
| 1 | 1 = valid message, but RX1IF set |
| 0 | 1 = valid message, but RX0IF set |