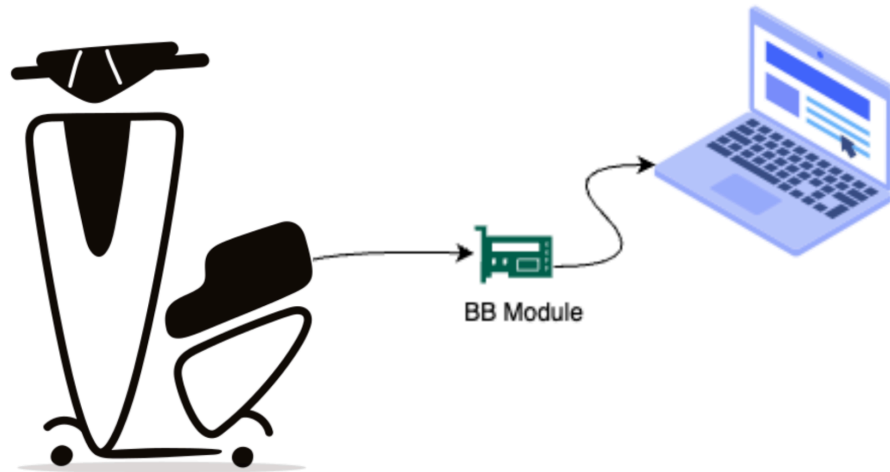


Reference Document

Block Diagram

Vehicle ↔ BB_Module ↔ Laptop



Vehicle to BB_Module

Following are the signals from vehicle that you get it on CAN messages, use them wisely for your application:

Vehicle Status1

CAN ID: 0x300

Vehicle to BB_Module

Frequency : Cyclic 100ms (10Hz)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Horn button	Brakes input	Indicator Switch	Throttle	Sidestand status	Start Button	-	-

Input Type	Data Type	Description
Horn button	bool	0 → Not Pressed 1 → Pressed
Brakes input	uint8	0 → No brakes pressed 1 → Left Brake Pressed 2 → Right Brake Pressed 3 → Both Brakes Pressed
Indicator Switch	uint8	0 → No button Pressed 1 → Left Pressed 2 → Right Pressed 3 → center Pressed
Throttle	int8	0 → Idle +ve values → Throttle forward
Sidestand status	bool	0 → Not Engaged 1 → Engaged
Start Button	bool	0 → Not Pressed 1 → Pressed

Vehicle Status2
CAN ID: 0x301
Vehicle to BB_Module
Frequency : Cyclic 100ms (10Hz)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Riding Mode	Vehicle Speed	Roll		Pitch		Yaw	

Input Type	Data Type	Description
Riding Mode	uint8	0 → Neutral 1 → Forward 2 → Reverse 3 → Hold up [Uphill] 4 → Hold down [Downhill]
Vehicle Speed	uint8	Vehicle Speed In kmph
Roll	int16 (little endian)	-180 to 180 degrees
Pitch	int16 (little endian)	-180 to 180 degrees
Yaw	int16 (little endian)	-180 to 180 degrees

BB_Module to Vehicle

Following are the signals from your device to set the vehicle params:

Vehicle Requests

CAN ID : 0x305

BB_Module to Vehicle

Frequency: Event message

Byte 0	Byte 1	
Command Type	Data	Description
0x01	0 → Disable 1 → Enable	Set Horn
0x02	0 → Disable 1 → Enable	Set HighBeam
0x03	0 → Disable both lamps 1 → Tail Lamp 2 → Brake Lamp	Set Tail/Brake Lamp
0x04	0 → Disable both Indicators 1 → Left Indicators On 2 → Right Indicators On 3 → Left indicators Off 4 → Right indicators Off	Set Indicator
0x05 *	0 → Forward Facing Position +ve → Steer Right -ve → Steer Left	Steering adjustment (forward position is 0) [Range -60 to 60]
0x06 *	0 → Clear Brake Request 1 → Request to Brake	Manual Brake Request

* These Commands are only applicable for the Phase-2 Challenge.

BB_Module to Vehicle

Motoring requests

CAN ID : 0x306

BB_Module to Vehicle

Frequency : Cyclic 100ms (10Hz)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Riding Mode	Vehicle Speed	-	-	-	-	-	-

Input Type	Data Type	Description
Riding Mode	uint8	0 → Neutral 1 → Forward 2 → Reverse 3 → Hold up [Uphill] 4 → Hold down [Downhill]
Vehicle Speed	uint8	Vehicle Speed In kmph [Range 0-5]

Note :

- 1. You need to throttle up to ride the vehicle**
- 2. If CAN 0x306 is not published for more than 1 second, then Riding_mode will be set to Neutral(0)**

Available Sensors

Sln o	Sensor	Note	Weightage per sensor	Max Units Allowed	Datasheet
1	IR sensor module	1) IR sensors are sensitive to light. 2) Tuning required to differentiate the path accurately	5	5	tcrt5000
2	Rain Drop Sensor module	NA	2	1	rain_sensor_mo dule
3	Ultra Sonic sensor	1) Sensor requires sound reflecting surface to work	10	4	JSN-SR04T <a href="https://rjrorwxhjil
ll5q.lldycdn.com/
JSN-SR04T-3.0-
aidnqBpoKliRljSl
qnqkilqj.pdf">https://rjrorwxhjil ll5q.lldycdn.com/ JSN-SR04T-3.0- aidnqBpoKliRljSl qnqkilqj.pdf
4	LDR sensor	1) Understand the ambient light	2	1	<a href="https://compone
nts101.com/sites
/default/files/com
ponent_datashe
et/LDR%20Data
sheet.pdf">https://compone nts101.com/sites /default/files/com ponent_datashe et/LDR%20Data sheet.pdf <a href="https://compone
nts101.com/resis
tors/ldr-datashee
t">https://compone nts101.com/resis tors/ldr-datashee t
5	Handle Bar Position Sensor	NA	2	1	<a href="https://spectra-s
ymbol-landing.s3
.us-west-1.amaz
onaws.com/data
-sheets/SoftPot-
Series-Datashee
t-v2019a.pdf">https://spectra-s ymbol-landing.s3 .us-west-1.amaz onaws.com/data -sheets/SoftPot- Series-Datashee t-v2019a.pdf

6	CYT2B7 Eval board	NA	NA	1	
7	Raspberry-Pi 5	NA	300	1	
8	Web Cam	NA		1	