

VETTURINO

Sense Enhancement in Fleets

AT INDIAN MOBILE CONGRESS



Tech
Mahindra
MAKERS LAB

BUSINESS PROBLEM

Transportation Network Services

Thousands of people fall prey to cab mishaps every year

Driver Negligence, Security Failures

Emergency Services

~ 1.25 million people die in road crashes every year

Delay in Access, De-centralized EMS

Logistics World

Annually, cargo crime in the US alone accounts for a direct merchandise loss of \$15-\$30 billion

Inadequate Monitoring, Pilferage

THE PERFECT 5G USE CASE - PHYGITAL

Monitor Driver Characteristics

Monitor Vehicle Performance

External interfaces to extend automobile ecosystem



THE SOLUTION
POTENTIAL
JGTM



Our Solution: Vetturino

Vehicle Intelligence Blackbox

- Once plugged in, helps in determining engine and driving characteristics of the vehicle.
- > 160 parameters collected viz. speed, location, G-Shock
- Near real time monitoring
- 8 I/O ports given to the system to extend connections within the automobile
- Customizable to add desired features



Our Solution – Hardware + Software



The live data of parameters of the vehicle from the device is sent across for analysis and reporting of the Engine performance.

Triggering/ Notification/ Alerts to be provided through the help of an API to be sent to the mobile.

Captures
160+ Service
parameters
from OBD

integrated
G-Shock,
GPS Sensors
GSM/Wifi

Camera input
port for Driver
Mood Analysis

Extendibility
8 Digital &
8 Analog IO

Vetturino Use case explained

- **EXTERNAL Actuator Senses**

Extension ports of Vetturino used to connect camera and monitor driver expressions, face and mood of the driver .

- i. 8 I/o ports available for connect and customized responses

- ii. Real Time control:

- 1. Facial expression analysis for fatigue

- 2. Real time actuation of flash lights and hazards lights

- 3. Real time proactive messaging via speakers in the car to alert the driver.

- Conversational control

- **Real Time CONTROL**

Extension OUTPUT ports of Vetturino used to start hazard lights flashing and Intermittent Horn Hooting in case of accidents or on observing the driver to be sleepy or fatigued. The G-shock sensor inputs and the face analysis of camera inputs determine these cases



...How Vetturino Works with 5G

- ▶ Vetturino installed on dashboard
- ▶ Driver mood identification
- ▶ Driver behavior
- ▶ Engine performance
- ▶ Real-time Analysis
- ▶ Feedback Alerts & Notifications
- ▶ Collection of Real time data
- ▶ Remote Control



Connecting Power Cable



Powering Up the Device

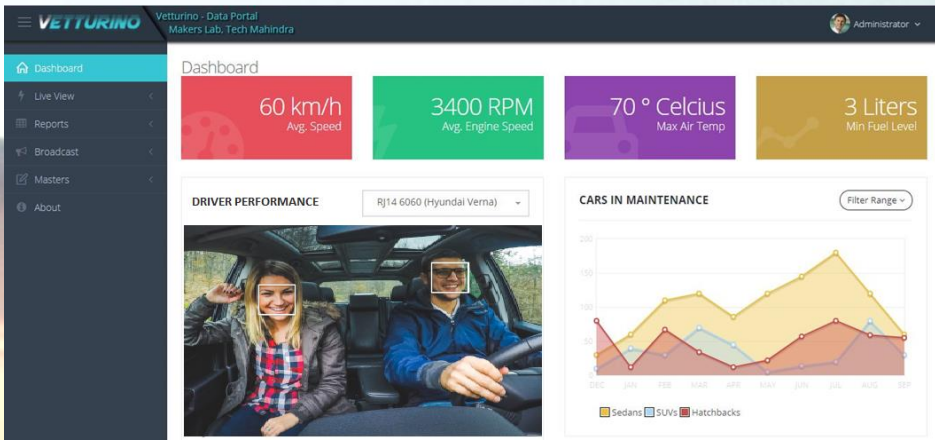


Vetturino here is connected through ECM and connected to external peripherals (if need be)

Here the device is also connected to the in-dash camera to provide driver mood analysis



Installation

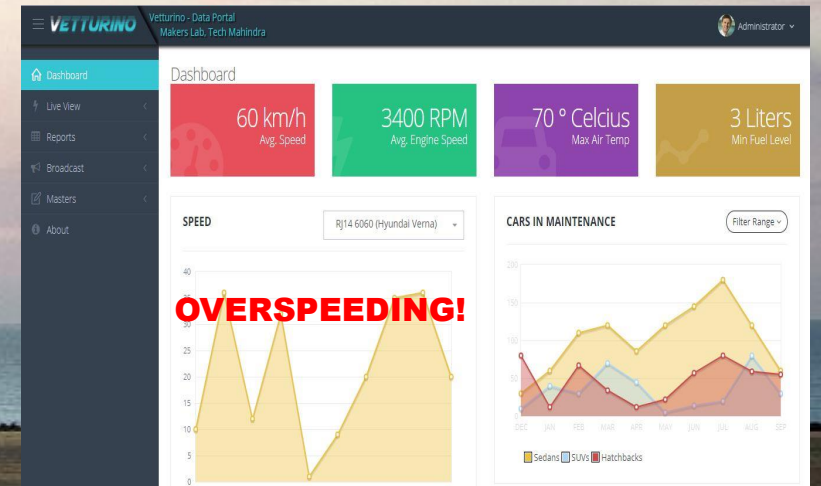


Here Vetturino is transmitting the live feed, with the help of an in Dash camera which captures the driver mood and then it's sent to the website using 5G.

The live feed is sent across for analysis and reporting of the driver mood which will be done using AI.



Driver mood Analysis



- Accelerometer
- Gyroscope
- G-Shock
- GPS sensors

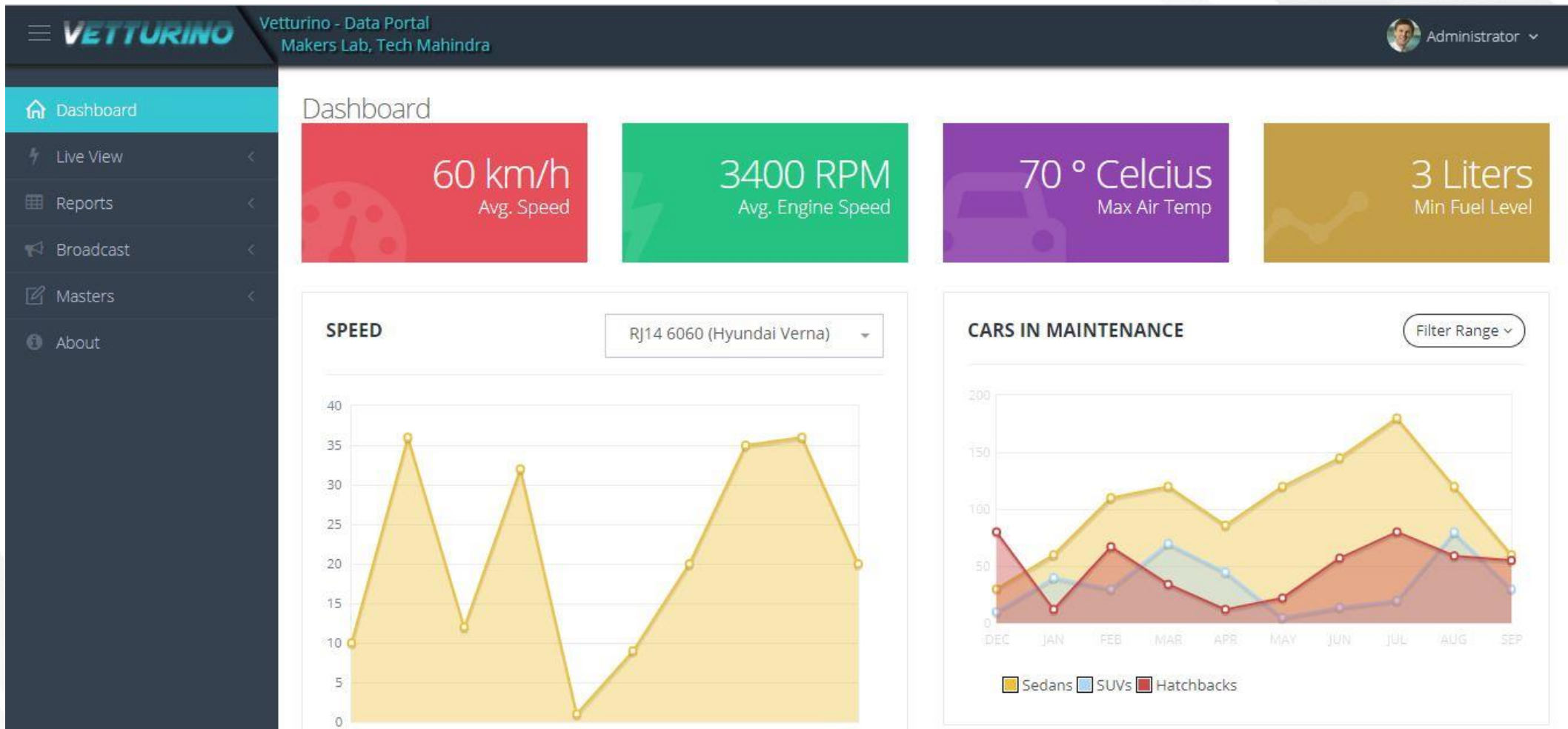


DRIVING BEHAVIOUR ANALYSIS



Whenever there is a mishap, Vetturino sends SOS alerts to emergency services and concerned parties

SOS ALERTS



Unlimited tags Multi-User Multi-Company Single Sign On Real Time Monitoring Secure access

Cloud Application







Conversation Car Ecosystem

WHY ARE BOTS POPULAR?

Bots bring instant gratification, a chance to engage with emerging technology, convenience, connection and conversational engagement.

WHAT ARE THE PUNDITS SAYING?

By 2022 \$8 billion in cost reduction

Top 10 Practices to make Chatbot great "<https://www.entrepreneur.com/article/296358>"

WHY IS IT STILL MESSED UP?

PwC research states that

Customers hate bots. Customers want more **humanity** and **less automation**, especially when something goes wrong. Reaching out to customer service is not a routine task for a customer as much it is for the company

One of the key expectation for a consumer is a knowledge employee

Focus is on technology and not on the customer centricity



Conversation Car Ecosystem



Proactive and reactive conversations

वोक्सवैगन कार में आपका स्वागत है सिमरन.

Welcome to your own automobile Simran

आप अपनी सीट बेल्ट पहनना भूल गए है।

Sorry but you have forgotten to put on your seatbelts

आपको ड्राइविंग करते 2 घंटे हो गए हैं, पास में एक कैफे, क्या आप एक ब्रेक चाहते हैं?

Its been two hours since you have taken rest. There is a café close by. Let us have a break

ऐसा लगता है कि आप बहुत तेजी से गाड़ी चला रहे हैं, आप 120 किमी प्रति घंटे को पार कर गए हैं

It seems you are in a hurry. Please reduce the speed as you are speeding at a rate of 120 Km/h

Physical and Digital Design Systems





Extending Car Conversation ecosystem beyond humans

Finding Alternative Route

There is an accident up ahead

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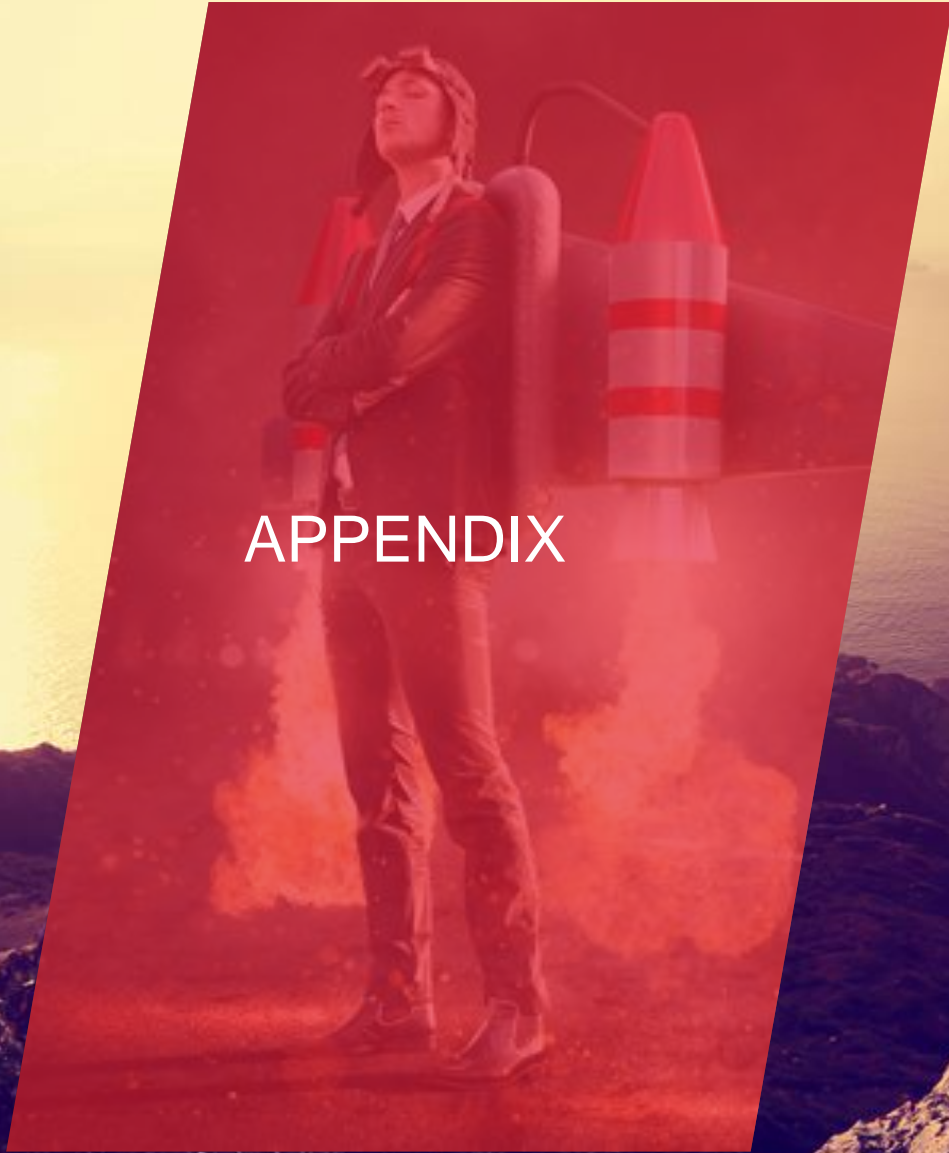




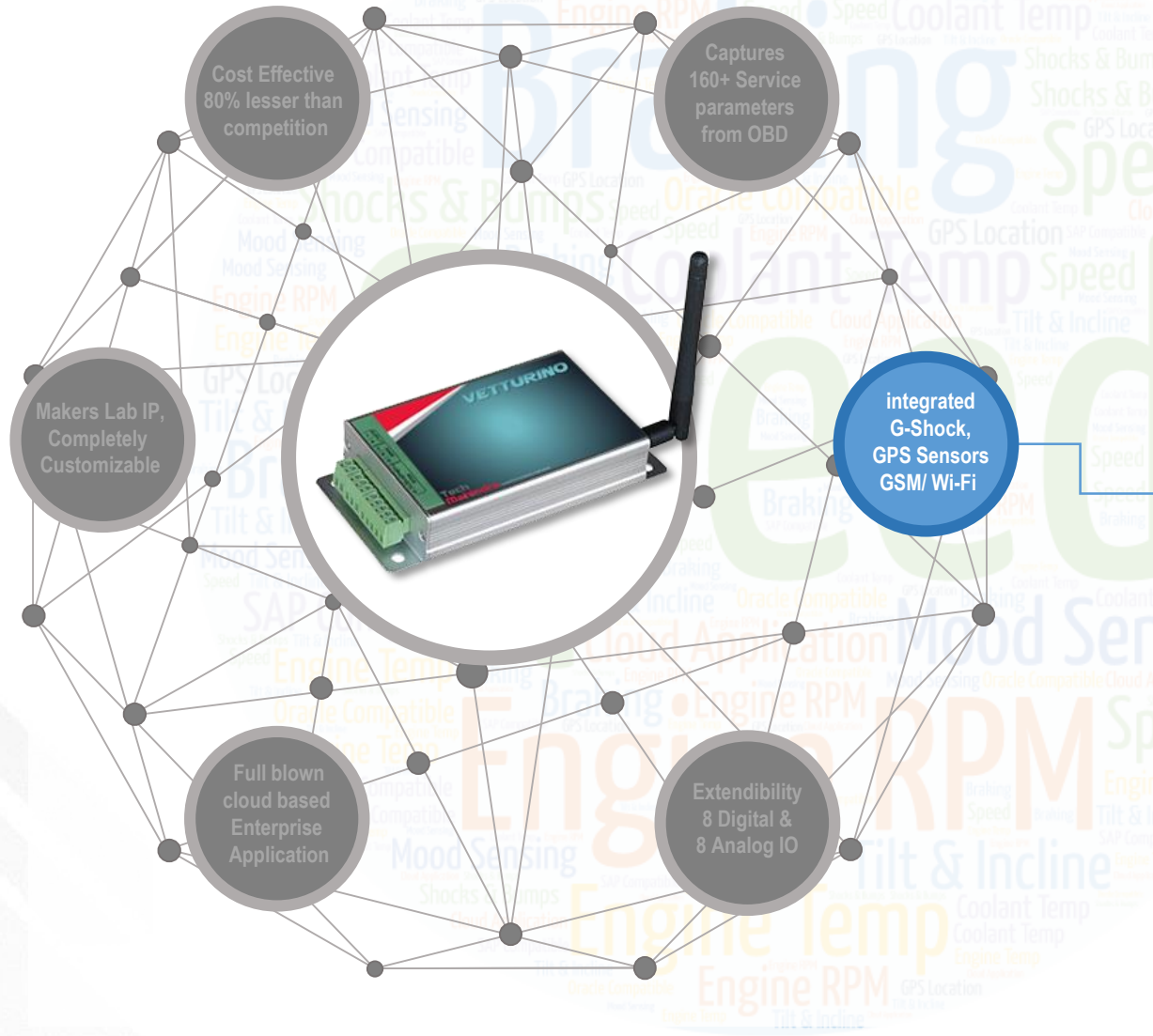
Use Cases

Plenty of use cases.

All newer vehicles are already being built with this as a standard feature



The Hardware

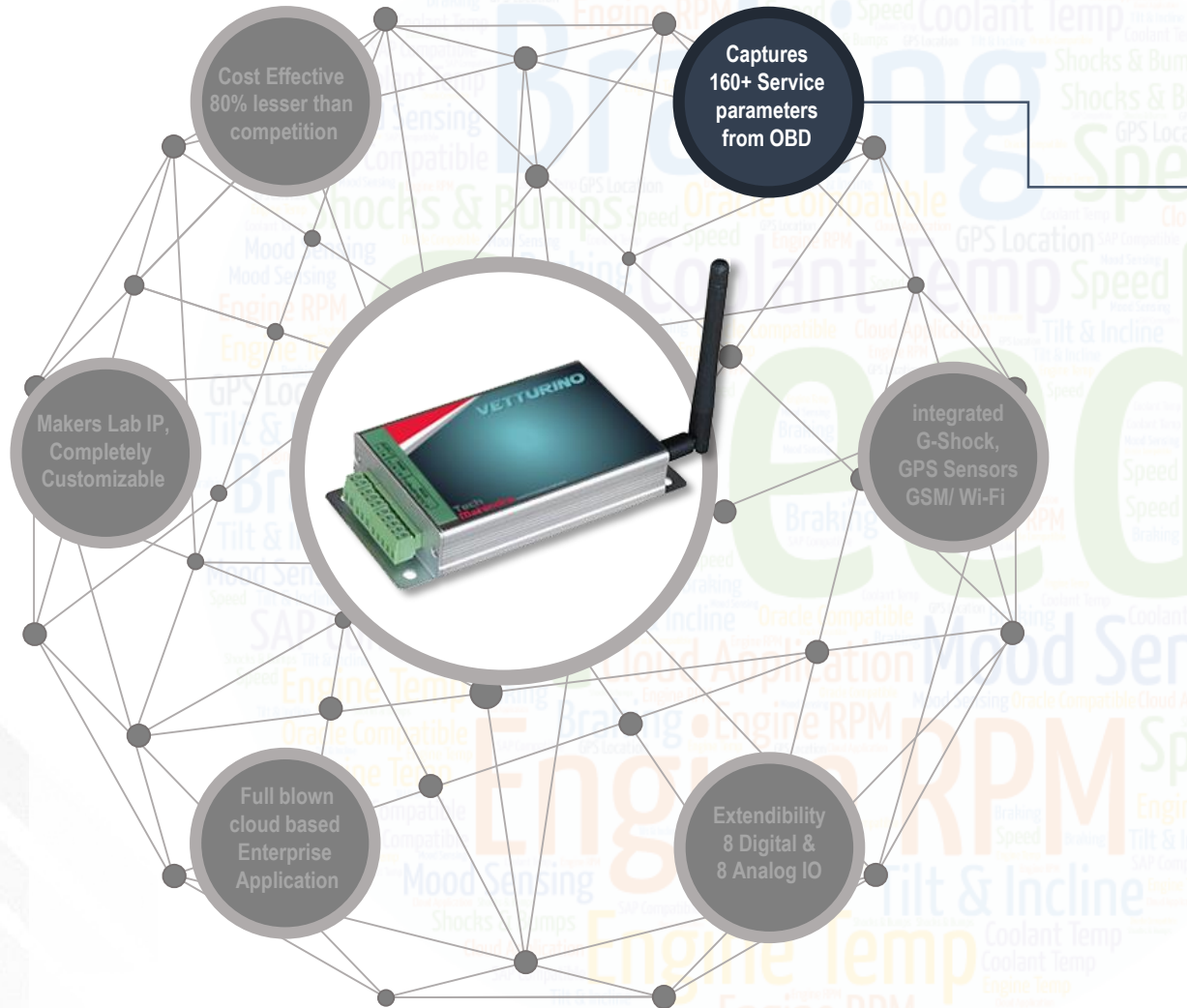


The quality of the driving can be determined by analysing the shocks and bumps that the vehicle goes through. With our built in 3-Axis Gyroscope and Accelerometer, Vetturino does exactly that.

It also comes with GPS Sensors pre-baked into it, which help determine the exact location, speed, direction and altitude.

Vetturino can connect to cloud via various methods, including WiFi and GSM, which make it ready for future 5G network expansions.

The Hardware



Vetturino directly reads all the primary parameters from the vehicle like Speed, RPM, Engine Temperature.

But it doesn't just stop there. It is capable of reading all 160+ service parameters from the vehicle which include individual cylinder misfires, engine fuel rate, exhaust pressure, engine power and more.

And all this is directly configurable from the cloud application.

The Hardware



Vetturino also comes with 8 Digital and 8 Analog ports. These ports aren't limited to reading data from external sensors, they can be configured to control and drive a plethora of devices.

These can range from child locks to the inbuilt entertainment system of the vehicle.

As is with everything, all this data can be sent, accessed and configured directly from the cloud.

The Hardware



The Cloud based Enterprise Application is a very powerful and flexible tool.

With an Illustrative Dashboard, and lots of customizability, it can show all the information you need, with separate uses for both the company and the end-user who could be renting a car.

The Hardware



Vetturino has been built in house from scratch. Hence it is highly customizable and can be tailored to the enterprise needs.

While both Vetturino, the device and the cloud application are coupled, they can be configured to work independently as well. The device can be used with a different cloud application, and the application can be used with a different device as well.

The Hardware



Vetturino isn't just a device, it's an entire ecosystem.

We have plans for future expansions and iterations to come.

Tech Specs

Communication

GSM Modes	EDGE/GPRS/GSM 850/900/1800/1900 MHz
Power Output	1.8W
SIM	Internal, Replaceable
Packet Data	TCP/IP

GPS

Technology	ublox NEO-6M
Sensitivity (tracking)	162dbm
Acquisition (normal)	cold<38sec, hot<1sec
Int. Antenna	on Board IPEX connector
Ext. Antenna	External antenna (3V-5V), SMA male Connector
	5 meter cable
	frequency 1575.42 MHz

Power

Input Voltage	7V - 32 V DC
Average	500mA
Current consumption	250mA

Environment

Temp, operation	40°C to +85°C
Temp, storage	40°C to +85°C
Humidity	80% to 90%

Dimensions & Weight

Dimensions	110x110x15mm
Weight	150gm

Inputs & Outputs

Inputs	8 input points for digital value
	8 input points for analog value
	12V input supply to power up the device
	2 COM for 2 relays
Outputs	5v output power supply

Interfaces

Voice Interface	Alert Buzzer
Connectors	16 digital and analog female terminal block connector
	SMA female connector for external antenna
	4 USB ports for camera

Device Parameters

- 1.PIDs supported [01 - 20]
- 2.Monitor status since DTCs cleared.
- 3.Freeze DTC
- 4.Fuel system status
- 5.Calculated engine load
- 6.Engine coolant temperature
- 7.Short term fuel trim—Bank 1, 2
- 8.Long term fuel trim—Bank 1, 2
- 9.Fuel pressure (gauge pressure)
- 10.Intake manifold absolute pressure
- 11.Engine RPM
- 12.Vehicle speed
- 13.Timing advance
- 14.Intake air temperature
- 15.MAF air flow rate
- 16.Throttle position
- 17.Commanded secondary air status
- 18.Oxygen sensors present (in 2 banks)
- 19.Oxygen Sensor Type 1 Voltage (Subtype 1 to 8)
- 20.Oxygen Sensor type 2 Short term fuel trim (Subtype 1 to 8)
- 21.OBD standards this vehicle conforms to
- 22.Oxygen sensors present (in 4 banks)
- 23.Auxiliary input status
- 24.Run time since engine start
- 25.PIDs supported [21 - 40]
- 26.Distance traveled with malfunction indicator lamp (MIL) on
- 27.Fuel Rail Pressure (relative to manifold vacuum)
- 28.Fuel Rail Gauge Pressure (diesel, or gasoline direct injection)
- 29.Oxygen Sensor Fuel–Air Equivalence Ratio (Subtype 1 to 8)
30. Commanded EGR
31. EGR Error
32. Commanded evaporative purge
- 33.Fuel Tank Level Input
- 34.Warm-ups since codes cleared
- 35.Distance traveled since codes cleared
- 36.Evap. System Vapor Pressure
- 37.Absolute Barometric Pressure
- 38.Oxygen Sensor Current (Subtype 1 to 8)
- 39.Catalyst Temperature
- 40.PIDs supported [41 - 60]
- 41.Monitor status this drive cycle
- 42.Control module voltage
- 43.Absolute load value
- 44.Fuel–Air commanded equivalence ratio
- 45.Relative throttle position
- 46.Ambient air temperature
- 47.Absolute throttle position B , C
- 48.Accelerator pedal position D, E, F
- 49.Commanded throttle actuator
- 50.Time run with MIL on
- 51.Time since trouble codes cleared
- 52.Maximum value for Fuel–Air equivalence ratio, oxygen sensor voltage, oxygen sensor current, and intake manifold absolute pressure
- 53.Maximum value for air flow rate from mass air flow sensor
- 54.Fuel Type
- 55.Ethanol fuel %
- 56.Absolute Evap system Vapor Pressure
- 57.Evap system vapor pressure
- 58.Short term secondary oxygen sensor trim, (A
- 59.Long term secondary oxygen sensor trim,(A
- 60.Fuel rail absolute pressure
- 61.Relative accelerator pedal position
- 62.Hybrid battery pack remaining life
- 63.Engine oil temperature
- 64.Fuel injection timing
- 65.Engine fuel rate
- 66.Emission requirements to which vehicle is designed
- 67.PIDs supported [61 - 80]
- 68.Driver's demand engine - percent torque
- 69.Actual engine - percent torque

Device Parameters

- 70.Engine reference torque
- 71.Engine percent torque data
- 72.Auxiliary input / output supported
- 73.Mass air flow sensor
- 74.Engine coolant temperature
- 75.Intake air temperature sensor
- 76.Commanded EGR and EGR Error
- 77.Commanded Diesel intake air flow control and relative intake air flow position
- 78.Exhaust gas recirculation temperature
- 79.Commanded throttle actuator control and relative throttle position
- 80.Fuel pressure control system
- 81.Injection pressure control system
- 82.Turbocharger compressor inlet pressure
- 83.Boost pressure control
- 84.Variable Geometry turbo (VGT) control
- 85.Waste gate control
- 86.Exhaust pressure
- 87.Turbocharger RPM
- 88.Turbocharger temperature
- 89.Charge air cooler temperature (CACT)
- 90.Exhaust Gas temperature (EGT) Bank 1, Bank 2
- 91.Diesel particulate filter (DPF)
- 92.Diesel Particulate filter (DPF) temperature
- 93.NOx NTE (Not-To-Exceed) control area status
- 94.PM NTE (Not-To-Exceed) control area status
- 95.Engine run time
- 96.PIDs supported [81 - A0]
- 97.Engine run time for Auxiliary Emissions Control Device(AECD)
- 98.NOx sensor
- 99.Manifold surface temperature
- 100.NOx reagent system
- 101.Particulate matter (PM) sensor
- 102.Intake manifold absolute pressure
- 103.SCR Induce System
- 104.Run Time for AECD #11-#15
- 105.Run Time for AECD #16-#20
- 106.Diesel After treatment
- 107.O2 Sensor (Wide Range)
- 108.Throttle Position G
- 109.Engine Friction - Percent Torque
- 110.PM Sensor Bank 1 & 2
- 111.WWH-OBV Vehicle OBD System Information
- 112.Fuel System Control
- 113.WWH-OBV Vehicle OBD Counters support
- 114.NOx Warning And Inducement System
- 115.Exhaust Gas Temperature Sensor
- 116.Hybrid/EV Vehicle System Data, Battery, Voltage
- 117.Diesel Exhaust Fluid Sensor Data
- 118.O2 Sensor Data
- 119.Engine Fuel Rate
- 120.Engine Exhaust Flow Rate
- 121.Fuel System Percentage Use
- 122.PIDs supported [A1 - C0]
- 123.NOx Sensor Corrected Data
- 124.Cylinder Fuel Rate
- 125.Evap System Vapor Pressure
- 126.Transmission Actual Gear
- 127.Diesel Exhaust Fluid Dosing
- 128.Odometer