



CLIMATE COMMITMENT

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MOBILITY

**iOne**

Robotic Vehicular Platform





**iOne**

## ONE PLATFORM MANY POSSIBILITIES FOR SMART MOBILITY

### **iOne**

Is a disruptive “Robotic Vehicular Platform” based in a modular concept allowing multiple full electric city vehicles configurations, increasing space usability while reducing size and weight and intensifying the communication interface with the environment, aligned with the new era of Smart Electro Mobility .





# iOne

## iOne ROBOTIC VEHICULAR PLATFORM

Modular robotic vehicular platform combining mechanical and electronic technologies , allowing the development of multiple vehicular applications for robotics , passengers and goods transportation in the cities framework.

### MODULAR & RELIABLE



**3 PATENTS**

### iOne REFERENCES

- Up to 8 standard iOne platform configurations.
- Custom iOne platform under demand.

#### MECHANICS

Robust modular chassis and sub-chassis, integrating traction and steering system.

#### ELECTRONICS

Wide range of Power & Control & Comfort electronic modules.



### iONE

Standard & Custom vehicular Robotic Platforms for City applications.



#### RELIABILITY

Developed under Automotive Standards.



#### COMMUNICATIONS

Information Technologies for a friendly & powerful communications.



#### DRIVING

From standard till assisted and autonomous driving.



#### MAINTENANCE SERVICE

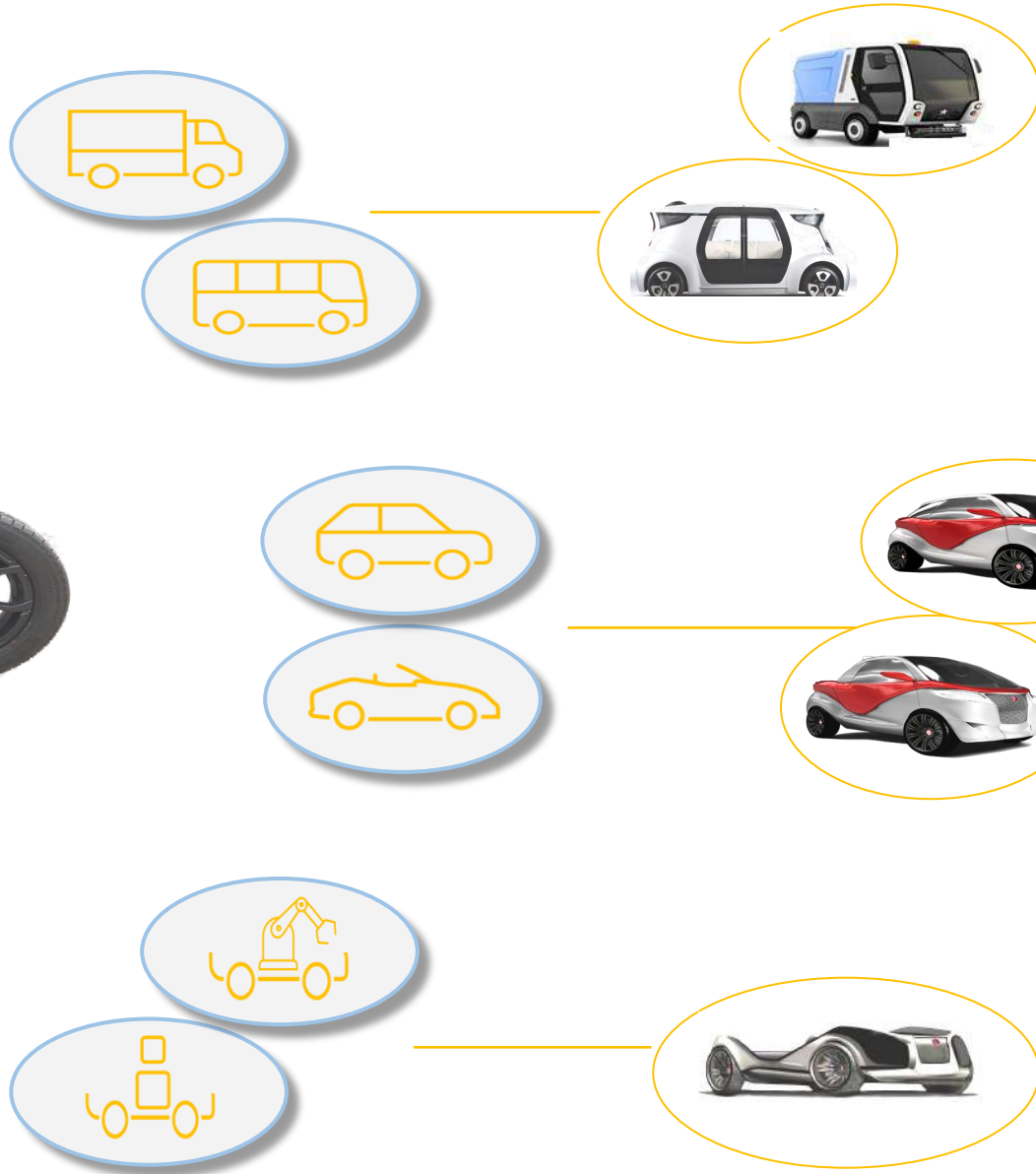
Hardware and Software maintenance services. Product Innovation.



**iOne**

**ONE PLATFORM MANY POSSIBILITIES FOR SMART MOBILITY**

**YOU DESIGN DE LIMITS**



- ◇ Cities, Industrial areas.
- ◇ Airports , Comercial Centres, ...
- ◇ EcoHotels, Theme Parks ....

- ◇ City Car.
- ◇ Airports , Comercial Centres, ...
- ◇ EcoHotels, Theme Parks ....
- ◇ Last mile deliveries.
- ◇ City maintenance.
- ◇ City surveillance.

- ◇ Infrastructures Surveillance.
- ◇ Last mile deliveries.
- ◇ Indoor operations.
- ◇ Robotic vehicle , AGV , ARM.

**iOne** Platform allows vehicles custom development based in a singular modular concept.

The body which can be converted for the desired application , can be quickly separated from the **iOne** platform, in which all the technology required for driving is bundled.



# iOne

## MAIN CHARACTERISTICS

### iOne 4.0 Platform Operation :

- ◇ Maximal speed : 90Kmh .
- ◇ Self weight + payload = 1100 Kgrs.
- ◇ Energy : Lithium-Ion batteries / Others.
- ◇ Assisted and Autonomous driving.
- ◇ Singular mobility : Wheel turning angle -70° to +70°.

### iOne 4.0 Platform Driving System :

- ◇ Multi-Axis industrial Joystick.
- ◇ Driving mode panel.
- ◇ Brake and Throttle pedals.
- ◇ Parking brake pushbutton.
- ◇ Assisted and Autonomous driving technology.

### iOne 4.0 Platform Electronics :

- ◇ Control & Power ECUs.
- ◇ V2X communications.

### iOne 4.0 Platform Mechanics :

- ◇ 2 Standard Chassis : Wheelbase 2660 & 1800 mm.
- ◇ Up to 4 iRobotWheels.
- ◇ Traction motor : from 3,75 to 7,5KW each iRobotWheel.
- ◇ Steering Wheel : Drive By Wire in each iRobotWheel.
- ◇ Braking System.





**iOne**

**MODULARITY**

**majermic**

**iRM & iFM**

Vehicle Front & Rear devices control

**iKeyLess**

Smart Keyless Entry and Start System

**iADAsys**

Driving assistance and autonomous driving

**iDashboard**

Instrumentation and control operations display

**iVDC**

Vehicle safety functions (Vehicle Dynamics ....)

**iTMC & iSMC**

Electronic modules for Traction and Steering System electric motors.

**iRobotWheel**

iRobotWheel integrating: Traction, Steering System, Brake & Shock absorber

**iChassis**

iOne Platform Chassis





**iOne**

**MODULES**

**iRM & iFM**

**iKeyLess**

**iADAsys**

**iDashboard**

**iVDC**

**iTMC & iSMC**

**iRobotWheel**

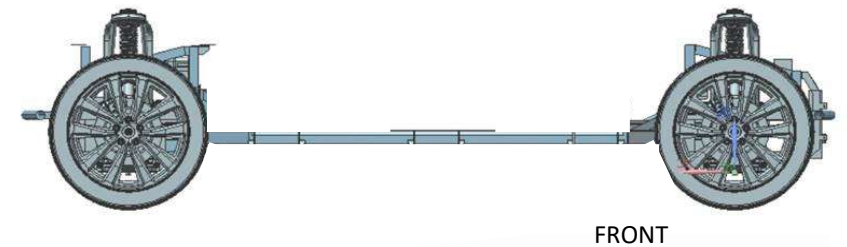
**iChassis**

**iChassis** for a wide range of vehicles from Robotic till City Car vehicles .

- ◇ 2 o 4 iRobotWheel with :Traction motor in 2 or 4 wheels & Steering System Drive By Wire in 2 or 4 wheels.
- ◇ Driving : Joystick, Autonomous , Mechanical
- ◇ Braking System
- ◇ Control & Power Electronics

**iChassis for iOne 4.0 :**

- ◇ Platform Architecture: Ladder Frame
- ◇ Material: Steel tube S235 (2mm, 3mm) and S355 ( 3mm)
- ◇ Topology: Steel sections, beams and support bars
- ◇ Floor enclosure: Metal sheet
- ◇ Battery Box: Floor Type



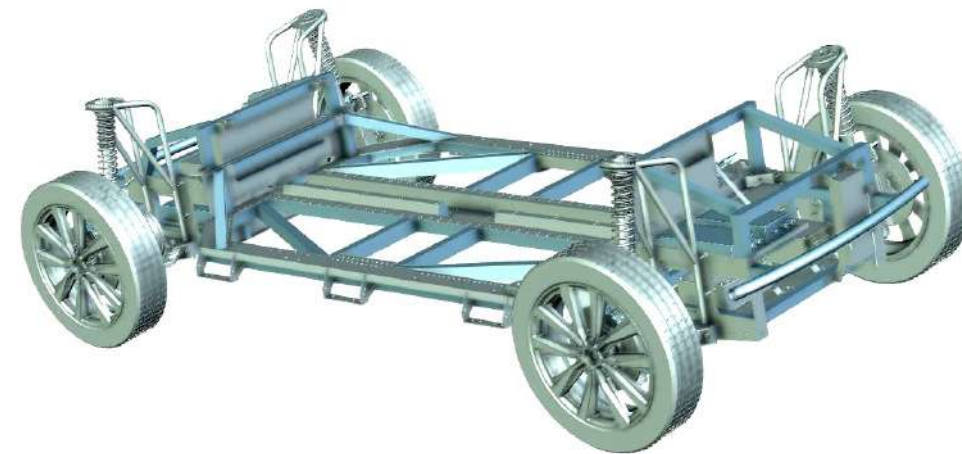
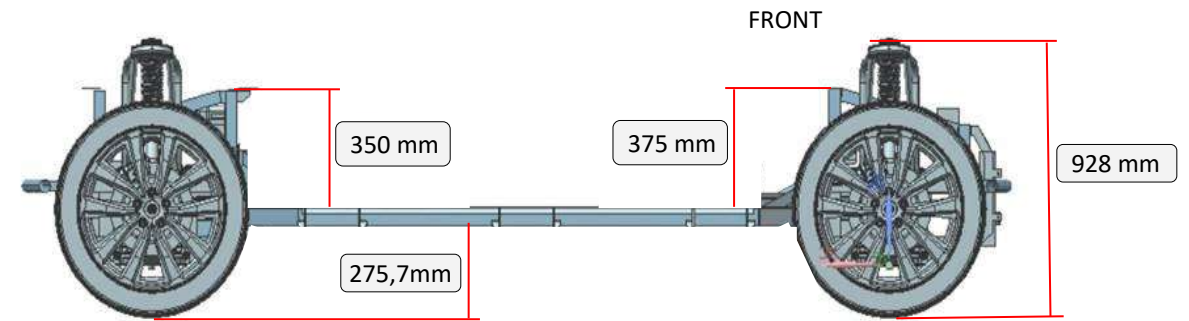
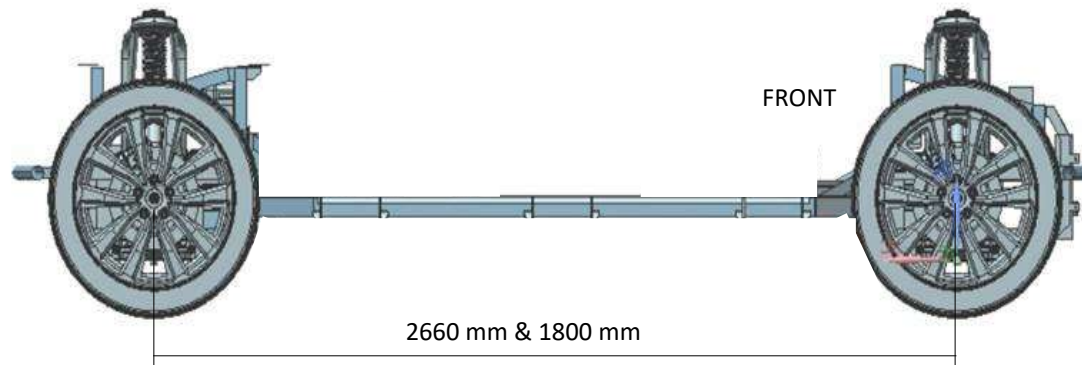
FRONT





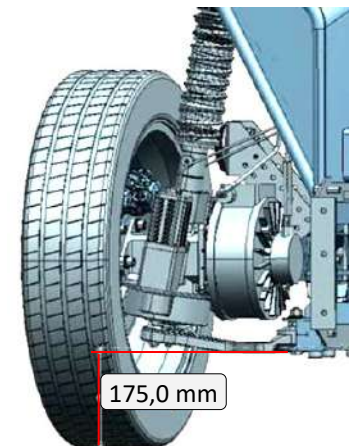
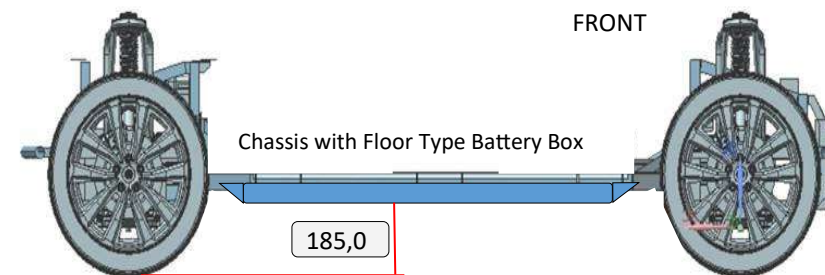
**iOne**

**iChassis for iOne 4.0 main parameters**



**iChassis for iOne 4.0 :**

- ◇ Wheelbase : 2 standard options \_ 2660 mm & 1800 mm
- ◇ Chassis width : 1452 mm & 1300 mm
- ◇ Wheel : 155/60/R19
- ◇ Ground clearance chassis: 185 mm (with floor type battery box)
- ◇ Ground clearance iRobotWheel 4.0 : 175,0 mm
  
- ◇ iChassis weight : 220Kg & 180Kg
- ◇ iRobotWheel 4.0 weight : Depending on iOne configuration.  
See weights in "iRoboWheel 4.0" presentation .
  
- ◇ Total vehicle weight with **iOne 4.0** platform = Self weight + Payload = 1100Kg

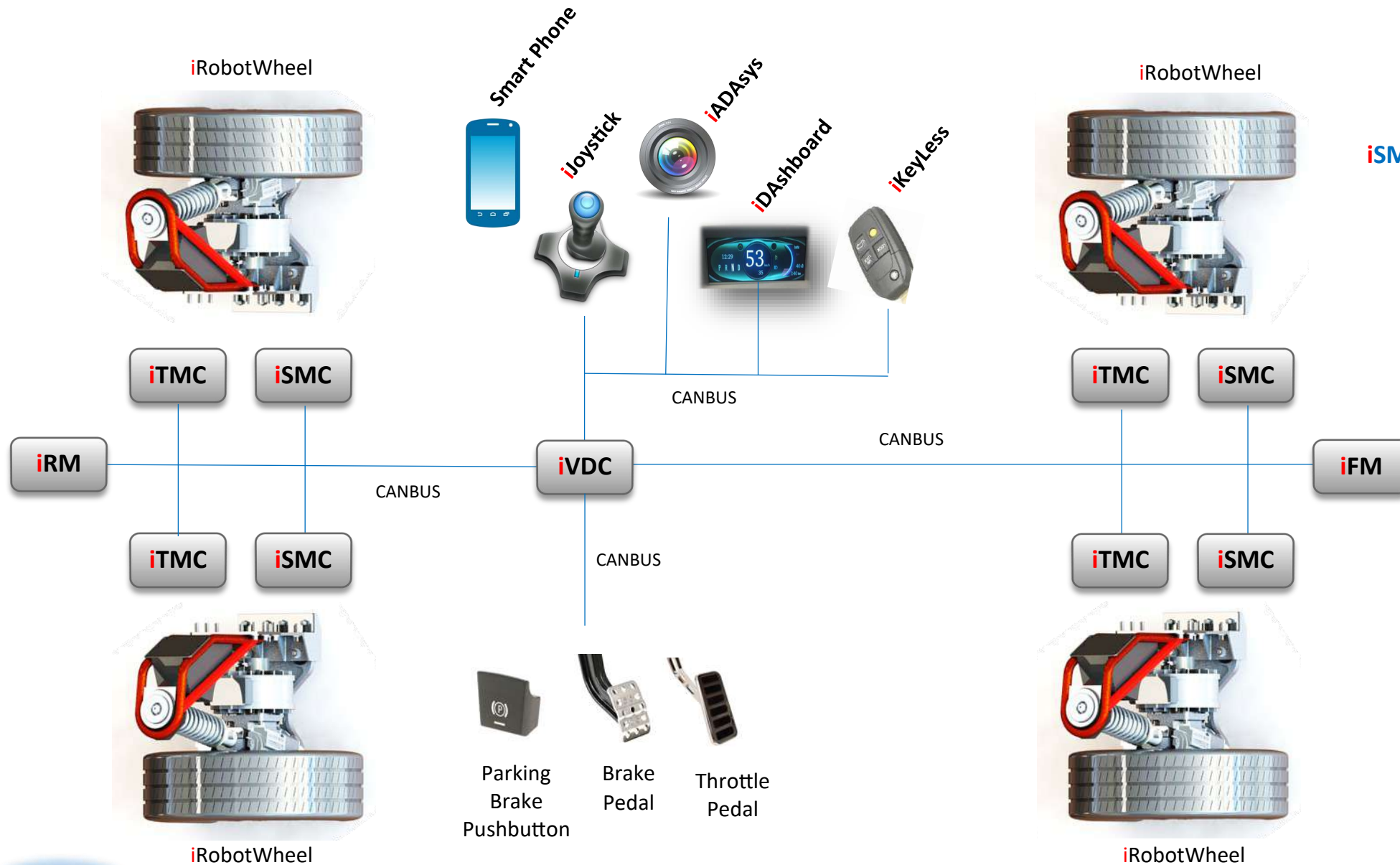






# iOne

## ELECTRONIC ARCHITECTURE



**iRobotWheel** : Drive By Wire Robot Wheel

**iVDC** : Vehicle Safety Functions ECU

**iTMC** : Power & Control ECU for Traction Motor

**iSMC** : Power & Control ECU for Steering System Motor

**iDashboard** : Instrumentation and control Display

**iJoystick** : Driving unit

**1 PATENT**

**iADAsys** : Advanced Driving Assistance

**iFM** : Vehicle front devices control

**iRM** : Vehicle rear devices control

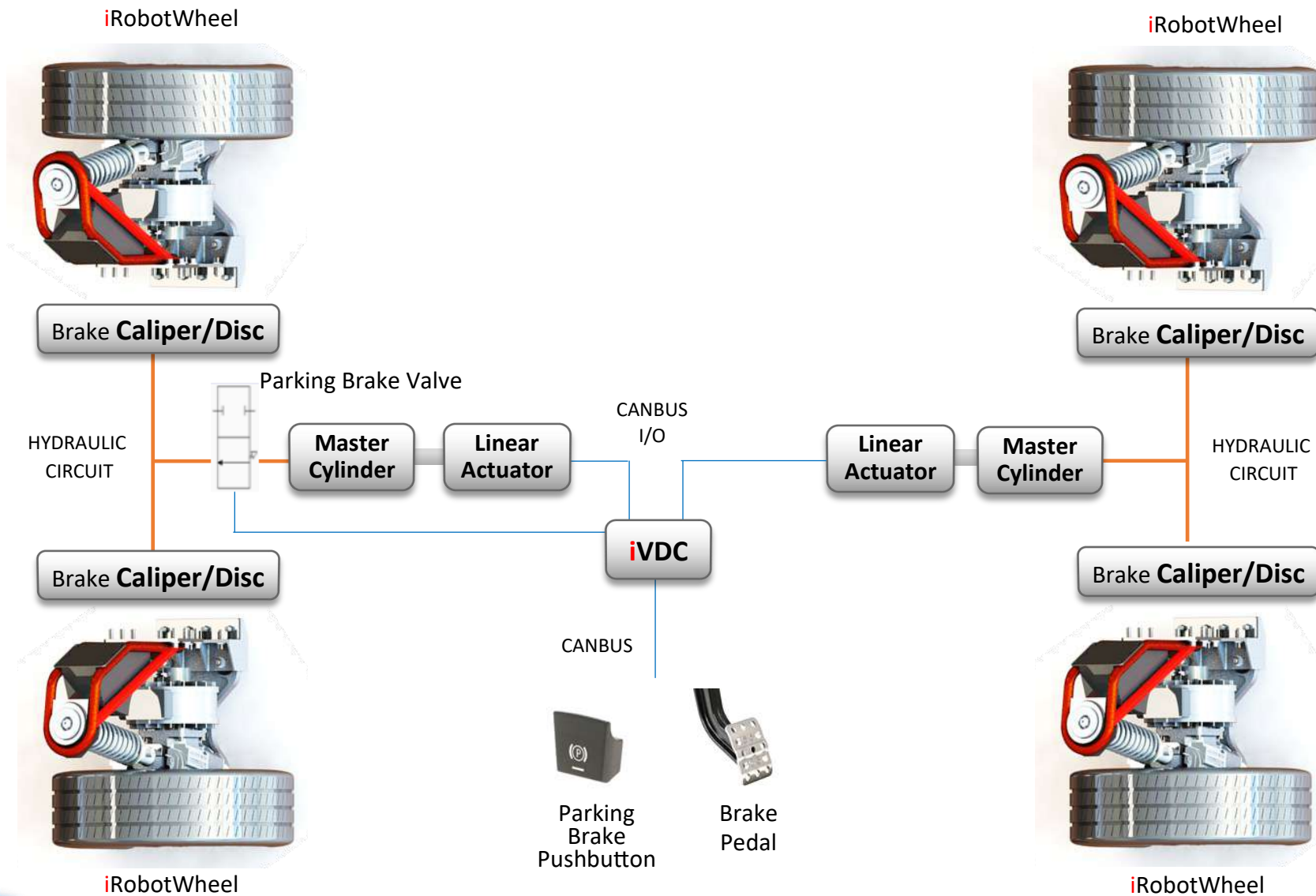
**iKeyLess** : Smart Keyless Entry and Start System





**iOne**

## BRAKING SYSTEM ARCHITECTURE



**iRobotWheel** : Drive By Wire Robot Wheel

**iVDC** : Vehicle Safety Functions ECU

**Linear Actuator** : Electric Actuator

**Master Cylinder** : Hydraulic actuator

**Parking Brake Valve** : Hydraulic Valve for parking brake

**Brake Caliper/Disc** : iRobotWheel Brake components



**iOne**

**MODULES**



**iRM & iFM**

**iKeyLess**

**iADAsys**

**iDashboard**

**iVDC**

**iTMC & iSMC**

**iRobotWheel**

**iChassis**

**iRobotWheel Drive By Wire** for a wide range of Power Train applications . **Standard iRobotWheel & Custom** design based in specific requirements.

**Shock Absorber :**

- ◇ Technology : MacPherson

**Brake :**

- ◇ Technology : Brake By Wire
- ◇ Brake type : Disc

**Electric Steering System motor x 2 :**

- ◇ 2 Motors redundant Topology
- ◇ Rated Power : 188 W \* 2
- ◇ Feedback 1 : Hall Sensor
- ◇ Cooling System : Air & Liquid Cooled (Optional)

**Wheel :**

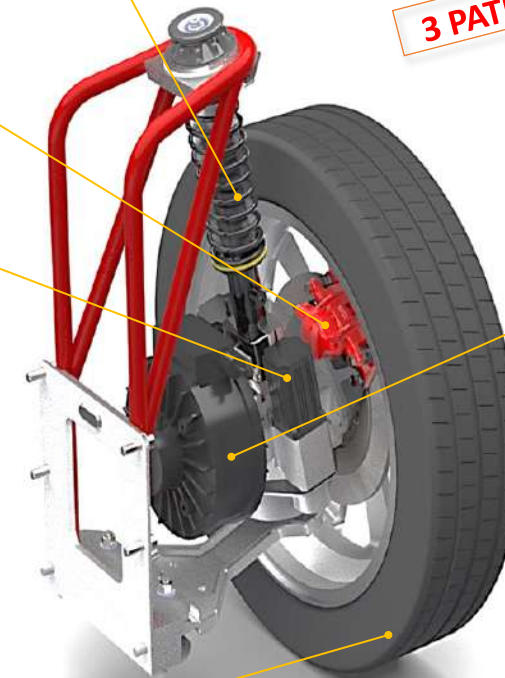
- ◇ Turning Angle Range : -70° to +70° (Standard)
- ◇ Size : 155/60/R19 (Standard)
- ◇ \* 32Kg \_ Basic version with 3.75 KW motor & 40 Kg with 7.5 KW motor

\* Weight not included:

- 1) Wheel type should be concreted based in specific needs
- 2) Interface with chassis. Usually is part of the vehicle's chassis structure

- ◇ Control & Power ECU
- ◇ Electric Traction
- ◇ Electric Steering System
  - ◇ Brake
- ◇ Shock Absorber
- ◇ Wheel

**3 PATENTS**



**Traction motor :**

- ◇ Power Supply : 330 VDC
- ◇ Rated Power : 3.75 KW & 7,5KW
- ◇ Rated Torque : 7.96 Nm & 15,9 Nm
- ◇ Feedback 1 : Encoder Incremental & Absolute
- ◇ Feedback 2 : Temperature Sensor
- ◇ Cooling System : Air Cooled & Liquid Cooled
- ◇ Protection : IP67
- ◇ Wheel Rated Torque : 55.72 Nm & 111,3 Nm



**iOne**

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**iTMC \_ Power & Control ECU for PWM & PMSM motors.**

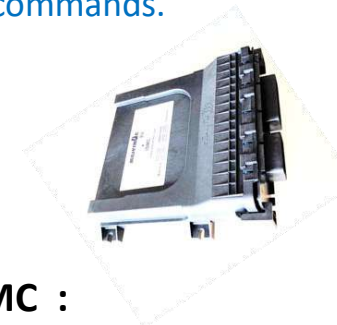
**Power Train Traction Motor applications based in Automotive standards.**

Power & Control ECU for Sinusoidal or Trapezoidal control for 4-Quadrant PWM and PMSM motors, allowing remote : positioning, speed and torque control via CANBUS commands.

**iSMC \_ Power & Control ECU for PMSM & BLDC motors.**

**Power Train Steering System applications based in Automotive standards.**

Power & Control ECU for PMSM & BLDC motors, allowing remote : positioning, speed and torque control via CANBUS commands.



**HARDWARE iTMC :**

- ◇ Power Supply \_ Power : 330 VDC & 12 /24 VDC
- ◇ 1 power output up to 8KW for PMSM motors
- ◇ 1 Incremental & absolute encoder input
- ◇ 1 Hall sensor input
- ◇ PWM 15 Khz
- ◇ Sensor Speed range : Up to 10K RPM
- ◇ 2 Digital inputs \_ 2 Analogic inputs
- ◇ CANBUS com \_ up to 1MBs
- ◇ Operation temperature range : -20°C to +85°C

**HARDWARE iSMC :**

- ◇ Power Supply : 12 VDC Redundant /24/48 VDC
- ◇ 2 power outputs for 2 PMSM - BLDC motors. Redundant topology.
- ◇ Max. Output Current : 15 A & 10 A , see versions
- ◇ 2 encoder / hall sensors inputs
- ◇ PWM : Up to 15 Khz
- ◇ Sensor Speed range : 10K RPM
- ◇ 4 Digital Inputs \_ 2 Analogic inputs
- ◇ CANBUS com \_ up to 1MBs
- ◇ Operation temperature range : -20°C to + 85°C

**SOFTWARE iSMC :**

- ◇ User interface
- ◇ Parameters configuration (Autotuning)
- ◇ Calibration
- ◇ 2 motors simultaneous control
- ◇ Main parameters monitoring and diagnostics

**SOFTWARE iTMC :**

- ◇ User interface
- ◇ Parameters configuration (Autotuning)
- ◇ Calibration
- ◇ Main parameters monitoring and diagnostics



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**iVDC \_ Vehicle Safety Functions ECU.**

ECU for the vehicle safety functions (Vehicle Dynamics , ...) based in Automotive standards.

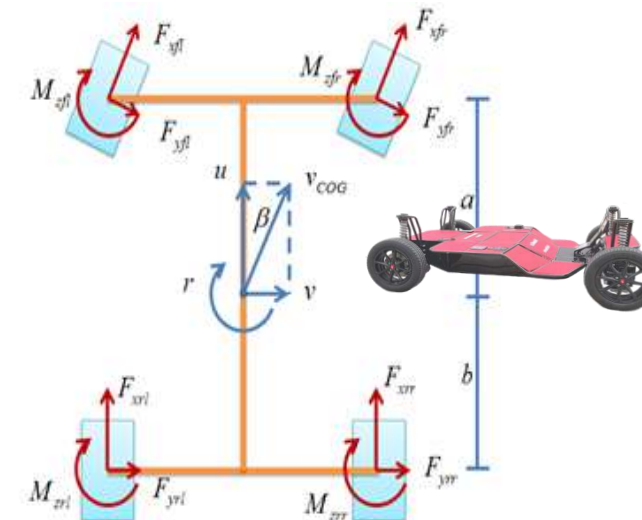
- ◇ Vehicle dynamics management
  - ◇ Powertrain management
  - ◇ Braking System management
- ◇ Driving Interface: Steering Wheel, Throttle, Joystick, SmartPhone, ADAS
  - ◇ Communications Gateway

**HARDWARE :**

- ◇ Power Supply : 12 / 24 VDC redundant
- ◇ Dual core microp certified for safety applications
- ◇ 4 x CANBUS com \_ up to 1MBs)
- ◇ 1 x FLEXRAY com
- ◇ 2 Accelerometer & 2 Gyroscope
- ◇ 1 Incremental encoder input
- ◇ 1 Torque sensor input
- ◇ 10 Analogic inputs \_ 3.3Vdc / 5 Vdc
- ◇ Operation temperature range : -20°C to + 85°C

**SOFTWARE :**

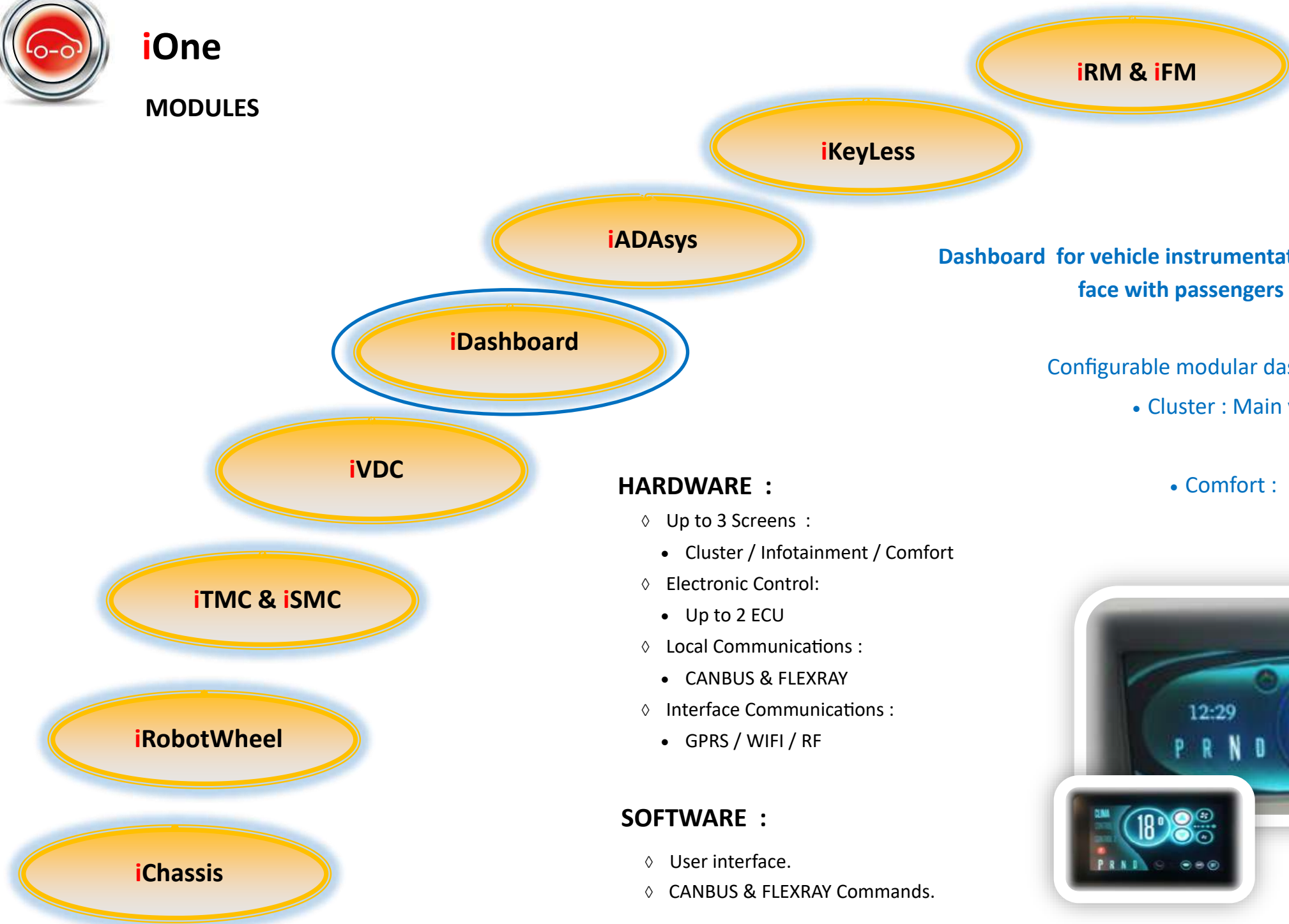
- ◇ User interface
- ◇ Parameters configuration
- ◇ CANBUS & FLEXRAY Commands
- ◇ Matlab / Simulink supported





# iOne

## MODULES



### iDashboard

Dashboard for vehicle instrumentation and control operations display. Interface with passengers and V2V \_ V2I interface communications.

Configurable modular dashboard systems based in 3 main screens :

- Cluster : Main vehicle parameters. Speed, odometer , .....
- Infotainment: Radio, navigation, .....
- Comfort : Heater control, mirror configuration , .....

#### HARDWARE :

- ◇ Up to 3 Screens :
  - Cluster / Infotainment / Comfort
- ◇ Electronic Control:
  - Up to 2 ECU
- ◇ Local Communications :
  - CANBUS & FLEXRAY
- ◇ Interface Communications :
  - GPRS / WIFI / RF

#### SOFTWARE :

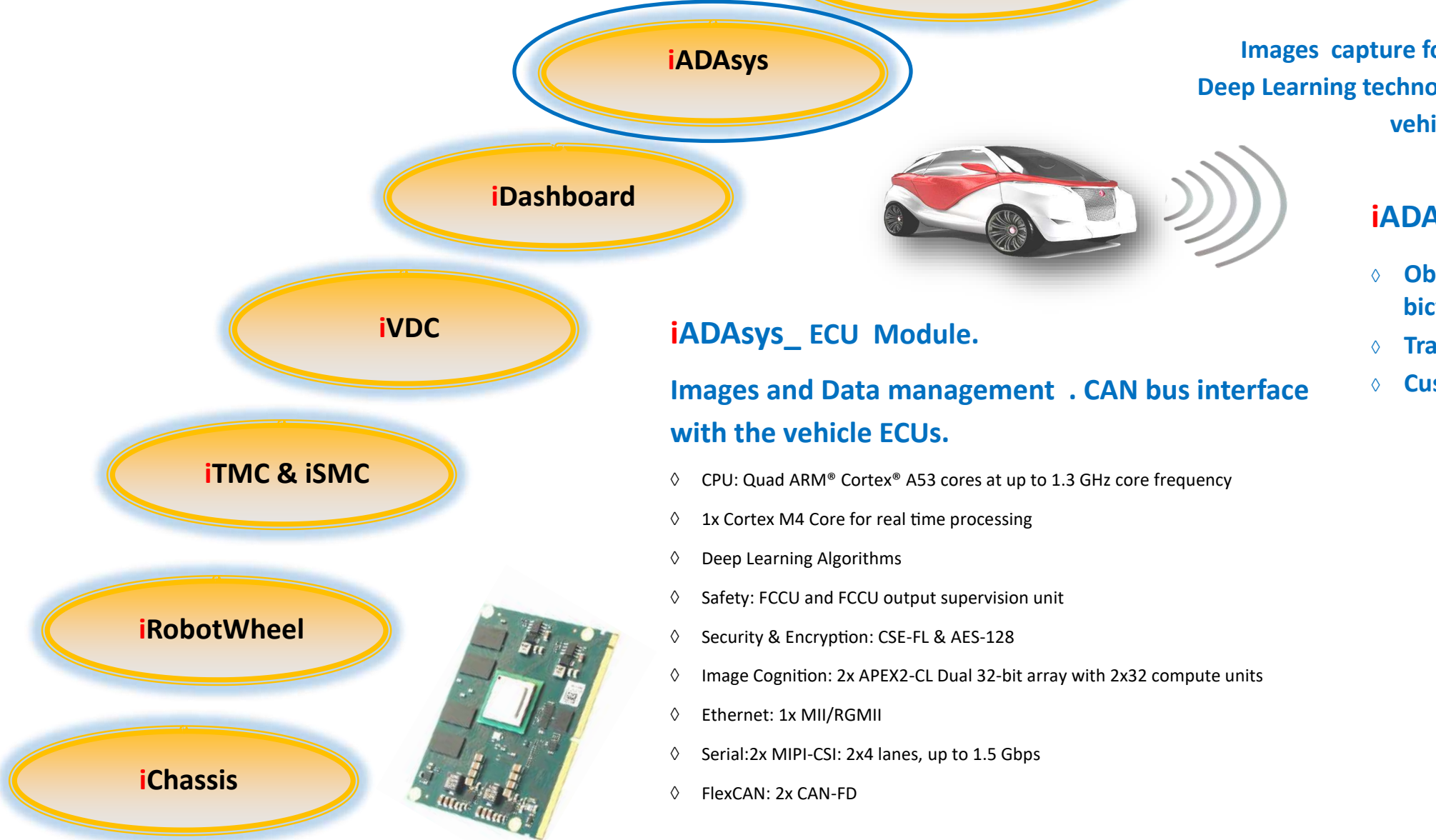
- ◇ User interface.
- ◇ CANBUS & FLEXRAY Commands.





**iOne**

**MODULES**



**iRM & iFM**

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**iADAsys**

**iDashboard**

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**iRobotWheel**

**iChassis**



**iADAsys\_ CAMERAS Module :**

Images capture for the execution of algorithms based on Deep Learning technologies for ADAS applications to support vehicle assistance and autonomous driving.

**iADAsys\_ Advanced Driving Assistance**

- ◇ Obstacle detection: vehicles, pedestrians, bicycles, etc.
- ◇ Traffic Signals detection
- ◇ Custom solutions

**iADAsys\_ ECU Module.**

**Images and Data management . CAN bus interface with the vehicle ECUs.**

- ◇ CPU: Quad ARM® Cortex® A53 cores at up to 1.3 GHz core frequency
- ◇ 1x Cortex M4 Core for real time processing
- ◇ Deep Learning Algorithms
- ◇ Safety: FCCU and FCCU output supervision unit
- ◇ Security & Encryption: CSE-FL & AES-128
- ◇ Image Cognition: 2x APEX2-CL Dual 32-bit array with 2x32 compute units
- ◇ Ethernet: 1x MII/RGMII
- ◇ Serial: 2x MIPI-CSI: 2x4 lanes, up to 1.5 Gbps
- ◇ FlexCAN: 2x CAN-FD



**HARDWARE :**

- ◇ Sensor: Up to 3 CMOS
- ◇ Type : Color
- ◇ Format : 1/2.7"
- ◇ Temp range: -40°C / 105°C
- ◇ Resolution: \_ 1312\*828 pixels
- ◇ Application : ADAS



**iOne**

**MODULES**

**iChassis**

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**iKeyLess**

**iRM & iFM**

**iKeyLess \_ Smart Keyless Entry and Start System.**

**SMART KEY LESS SYSTEM** for access control , safety and vehicle start/stop function.

Turnkey solution , based in a complete mechatronic solution and advanced software.

**PEPS** : Passive Entry Passive Start electronic unit.

- ◇ 6 LF + Immobilizer
- ◇ Encryption based in AES128
- ◇ RF Antenna (Rx / Tx)
- ◇ Smart Switch Input ( Anti wet)

**PKE** : Remote Smart Key.

- ◇ 3D LF Coil
- ◇ Motion Sensor
- ◇ Smart Switch Input ( Anti wet)

**PKE** : Smart Phone.

- ◇ Data transmission rate : 420Kb/s. Safe protocol.
- ◇ Frequency : 13.56 Mhz ( free )
- ◇ Maximal distance : 20 cm
- ◇ APP : Digital Key application

**ANTENNA** : LF & NFC antenna.

**ESCL** : Steering Column mechanical latch.

**START / STOP** : Pushbutton.

**PKE \_ SMART PHONE**  
NFC / APP



**PKE \_ SMART KEY**  
LF/RF







**iOne**

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**iChassis**

**iFM \_ ECU for the vehicle front devices control**

Digital and analogic devices control concerning the front side of the vehicle

- Front vehicle lights
  - Front wiper
  - Water Pump
  - Horn

**iRM \_ ECU for the vehicle rear devices control**

Digital and analogic devices control concerning the rear side of the vehicle

- Rear vehicle lights
- Rear Wiper
- Water Pump
- Trunk lock



**HARDWARE iFM :**

- ◇ Power Supply : 12 VDC
- ◇ CANBUS com \_ up to 1MBs
- ◇ Up to 30 Digital outputs
- ◇ Up to 10 Digital inputs

**SOFTWARE iFM :**

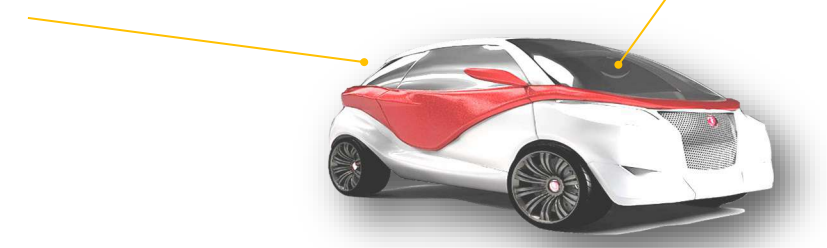
- ◇ Application management.

**HARDWARE iRM :**

- ◇ Power Supply : 12 VDC
- ◇ CANBUS com \_ up to 1MBs
- ◇ Up to 10 Digital outputs
- ◇ Up to 10 Digital inputs

**SOFTWARE iRM :**

- ◇ Application management.





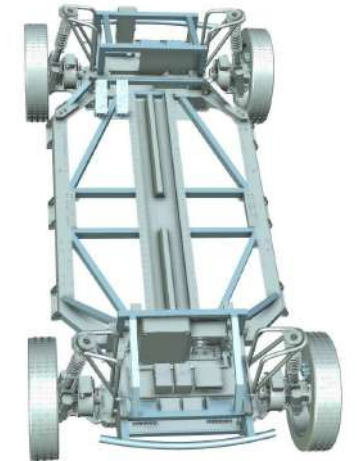
**iOne**

**PLATFORM CONFIGURATION TABLE**



**iOne 4.0 Model**

<b>iOne 4.0 Configuration _ Standard</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	<b>P5</b>	<b>P6</b>	<b>P7</b>	<b>P8</b>
<b>iChassis :</b> <ul style="list-style-type: none"> <li>WheelBase 2660 mm</li> <li>Braking System</li> </ul>	1	1			1	1		
<b>iChassis :</b> <ul style="list-style-type: none"> <li>WheelBase 1800 mm</li> <li>Braking System</li> </ul>			1	1			1	1
<b>iRobotWheel :</b> <ul style="list-style-type: none"> <li>Electric Traction Motor <b>3,75KW + iTMC</b></li> <li>Electric Steering System + <b>iSMC</b></li> <li>Disc Brake</li> <li>Shock Absorber</li> </ul>	2 Front 2 Rear	2 Front	2 Front	2 Front				
<b>iRobotWheel :</b> <ul style="list-style-type: none"> <li>Electric Traction Motor <b>7,5 KW + iTMC</b></li> <li>Electric Steering System + <b>iSMC</b></li> <li>Disc Brake</li> <li>Shock Absorber</li> </ul>					2 Front 2 Rear	2 Front	2 Front	2 Front
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<b>iRobotWheel :</b> <ul style="list-style-type: none"> <li>Disc Brake</li> <li>Shock Absorber</li> </ul>				2 Rear				2 Rear





# iOne PLATFORM CONFIGURATION TABLE



## iOne 4.0 Model

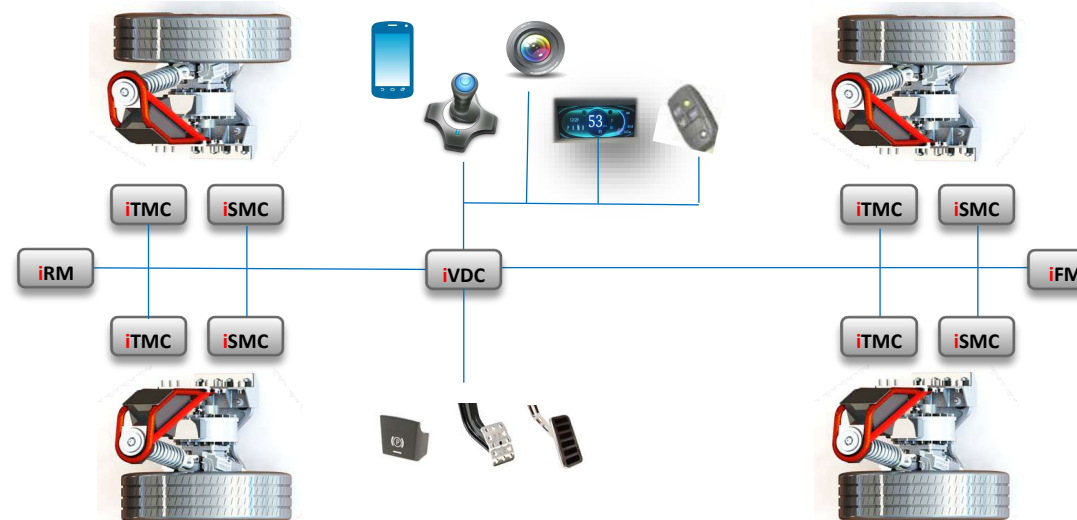
iOne 4.0 Configuration _ Standard	P1	P2	P3	P4	P5	P6	P7	P8
iVDC : Vehicle Safety Functions ECU	1	1	1	1	1	1	1	1
iDashboard : Instrumentation and control Display	1	1	1	1	1	1	1	1
iJoystick : Driving unit	1	1	1	1	1	1	1	1



iOne 4.0 Configuration _ Optional	P1	P2	P3	P4	P5	P6	P7	P8
iFM : Vehicle front devices control								
iRM : Vehicle front devices control								
iKeyLess : Smart Keyless Entry and Start System								
iADAsys : Advanced Driving Assistance								
iMaintenance : iCloud data base , traceability and monitoring								
Batteries : Various capacities and technologies based in the application								



### STANDARD & CUSTOM SOLUTIONS





CLIMATE COMMITMENT

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MOBILITY

# iOne

## Robotic Vehicular Platform



### Masermic

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