



# **ENGEN Consulting & Business Solutions**

Accelerate your product development & manufacturing with us

# About Us

Engen is a product development consulting company.

Together with its group companies offers services & solutions to OEMs and Tier 1 companies as their extended team to increase productivity & optimize their people cost

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**Product**

Embedded & Application Software Development

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**Development**

Mechatronics Product Development

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**Services**

Proto to Production Support Services

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**EMBEDDED  
DEVELOPMENT  
CAPABILITIES**

# Embedded Systems

## ❑ Power Electronics:

DC to DC driver, AC to DC Driver, DC H Bridge Driver, BLDC Driver up to 250W, Stepper Driver, LED Drivers, SMPS, MPPT, Dimmable TRIAC Driver and Servo Drive Control, UV Driver, High Voltage Power supply, 3 Ø Preventer, Solenoid Valve controller, APFC, DC-DC PWM drivers, Stepper and servo driver.

## ❑ Embedded Domain:

GSM/GPS based Asset tracking Devices, SCADA via CAN for Machine parameter Monitoring and control System, Smart AC power saver, Energy Tracking Meter, Emergency lamp Charger and Battery charger, Servo Stabilizer Power monitoring system with Front end Database.

## ❑ Automotive Domain:

OBD II- USB to CAN FD, K-Line, LIN, vehicle, LCD and TFT Cluster for Electrical Vehicle, Electrical vehicle Parameter IOT monitoring, Battery Management system for Bi-Cycle, BLDC drivers.

## ❑ Textile:

Electronics Shuttle /Rapier Jacquards and Finger selectors, IGBT Breaker, Variable 3 Phase Motor Controller, Hand Loom Driver, Handloom Jacquards, Warp and Weft controller, Dobby, Name Writer, Stepper & BLDC Controller for spinning and Cone winding, Multi color Design Mixing for weaving application.

# Embedded Systems

## ❑ Industrial:

PLC Driver Data logging and Analysis via Ethernet and RS485, CAN communication base IOT web server Monitoring and Control System , Compressor control System, Spindle controller, Propeller Controller, CMRL LED control Ethernet Controller, Encoders, Angle sensor, HMI Ethernet.

## ❑ IOT:

Long Range Wireless Communication ( 1Km) and GPRS based Cloud data down/up stream ,Wi-Fi IoT devices, GPS based Audio Announcement System, ( Accident Location alert for Tanker Vehicle).

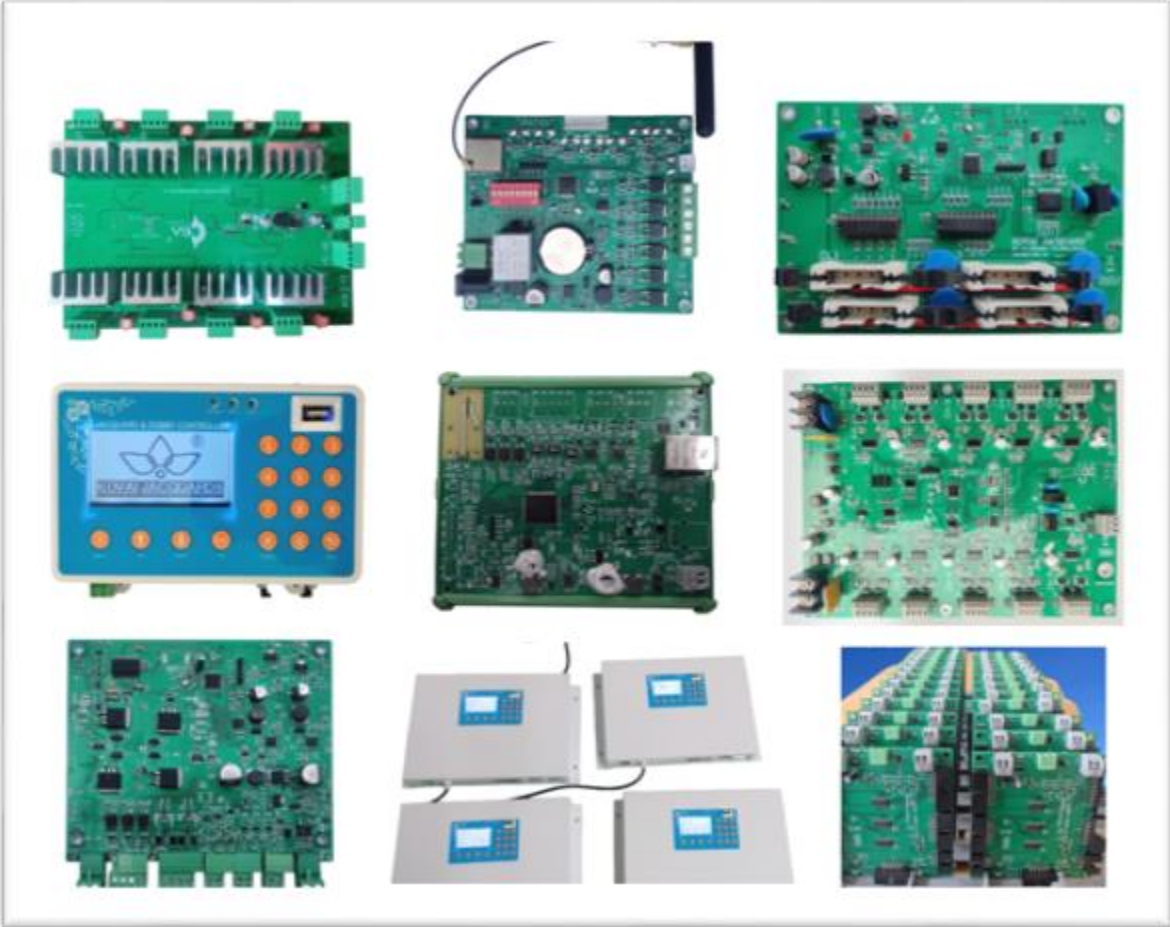
## ❑ Interfaced Devices and Sensors:

Weighing bridge ,24Bit ADC /DAC, APP sensor, PH Sensor, Conductivity, RTD, LCD Segment Driver , Transmitter, Thermistor, Thermopile, Air Mass sensor, Fuel level sensor, Gear Position sensor, Pressure sensor and MEMS.

## ❑ Web Application:

Python based Web Hosting and Machine parameter monitoring ( Offline and Online), SQL database Management offline, Python frontend tools for different application, Productivity and efficiency tracking.

# Embedded Systems



# Value added Services - European Client

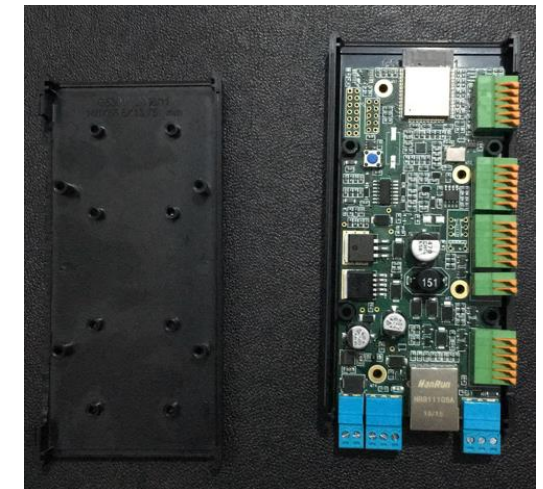
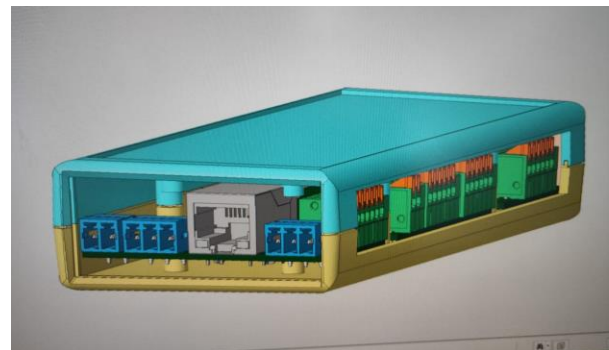
## From design support, Prototype to Production

- *All subsystem development  
Mechanical, Hardware & Firmware  
,coordination with Certification Body*
- *PCBA - Partner supply*
- *Industrial Product - IoT Device*
- *Wifi & Bluetooth Modules*
- *Scope of delivery*
  - DFM
  - Tooling
  - Prototype builds
  - Sourcing of non mechanical parts
  - Assembly
  - Testing
  - Packing and Shipment

	①	Name			
			39		Device Settings
			40		Flush Configuration
1		System Architecture	28		Statistics
2		Update System requirement(Current version 7.0)	28		Diagnostics
3		DFMEA	28		Information
4		EE	28		Integration Testing
5		Testing of V1.5	28		MVP2 Protobuild ( ? Sets)
6	✓	Board level Testing & bring-up	28		Vojtech Review supported by External expert
7	✓	Functional Testing as per the test document dated 02Dec2019	25		PCB Component Procurement
8	✓	Testing for Mosfet to be "off" during power on with Specified.	11		Initiate Production vendor quotes & Finalization
9		To do the Spice Analysis of the circuit	25		PCB Manufacturing
10	✓	Limited compliance test ( Optional - Tests 14 to 20 in test plan)	20		Assembly of prototypes
11	✓	List of changes	31		System level testing
12	✓	Development version(MVP2) V1.6	31		Ship to Customer
13		Schematic Change & review	14		MVP2 Testing ( ? Sets)
14		Gerber	21		Test Plan development
15		V2.0 Release for manufacturing	21		Type testing acc. to relevant standards – attachment (ACO T...
16		Manufacturing feedback for improvements	21		Design document update
17		ME	28		Vojtech Review supported by External expert
18		Mechanical Box - Any update required??	28		Exhibition deliverables
19		Sealed box design may be a requirement as variant	28		China Marine Exhibition
20		Firmware	5/		Lursen test sample & Functional Mobile App
21	✓	Testing Support	5/	✓	Firmware release
22	✓	Firmware for Lursen sample	5/	✓	Functional Mobile app
23	✓	Firmware required for HW1 testing	9/	✓	Sea Japan, Tokyo 11-13/3
24	✓	Firmware for RS485 and Ethernet testing	9/		APM, Singapore 18-20/3
25		MVP2	9/		Testing by ACO Counterpart
26		Firmware specs and architecture (incl GATT stack plus Modbus	9/		Operational testing in ACO Marine building (1-2 toilets, 1st H...
27		Setup static code analysis per MISRA C guidelines	9/		Operational testing in Black Steel Production in ACO Industri...
28		ETHERNET Driver	16/		MVP3
29		MODBUS - RS485	6/		HW Rev 3 update and release
30		MODBUS - ETHERNET	15/		Firmware update and release
31		BLE - Other services	25/		Mobile App update and release
32	✓	ADC - Application	9/		Manufacturing and populating of 3rd HW revision from the Pr...
33		Application details - Remaining	6/		System testing
34		NVM read writes	6/		Shipment to ACO Counterpart locations
35		Support /Integration Testing	27/		MVP4 (T: 5/2020 – 7/2020 )
36		Firmware Rel 2.0	3/		EOL tester spec development
37		Mobile App	28		
38	✓	Functional app for Lursen	28		

	①	Name	
77		EOL order release - Design & review	25
78		EOL (End-of-Line) testing implementation	25
79		Production Readiness	25
80		Pilot build	1C
81		Approval for Production	1/

Project Plan & the Process Adopted



# *Value added Services - Box Build - Medical Equipment Client*

- *Assembly of parts produced inhouse and sourced.*
- *PCBA - Partner supply*
- *Medical equipment*
- *Wired and wireless module*
- *Scope of delivery*
  - DFM
  - Tooling
  - Prototype builds
  - Sourcing of non mechanical parts
  - Assembly
  - Testing
  - Packing and Shipment



# Value added Services - Box Build - Meter Manufacturer

- *Assembly of parts produced inhouse and sourced.*
- *PCBA - Partner supply*
- *Industrial equipment*
- *Scope of delivery*
  - Enclosure Design ,Tooling
  - Prototype builds
  - Sourcing of non mechanical parts
  - Assembly
  - Testing
  - Packing and Shipment



# *Value added Services - Box Build - Healthcare Product Company*

- *Assembly of parts produced inhouse and sourced.*
- *PCBA - Partner supply*
- *Healthcare Product*
- *Scope of delivery*
  - Tooling
  - Prototype builds
  - Sourcing of non mechanical parts
  - Assembly
  - Testing
  - Packing and Shipment



# *Value added Services – Box Build – Textile Manufacturer*

- *Assembly of parts produced inhouse and sourced.*
- *PCBA – Partner supply*
- *Textile Machine Controller*
- *GSM Module & Inbuilt Flash Memory*
- *Scope of delivery*
  - Tooling
  - Prototype builds
  - Sourcing of non mechanical parts
  - Assembly
  - Testing
  - Packing and Shipment



# PCBA Partner Capabilities

PCB Sourcing

Pick & Place

Industry

- Automotive
- Textile
- Industrial



# THANK YOU

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