



GadgEon

Engineering Smartness

IO MODULE TO MONITOR AND CONTROL FACTORY EQUIPMENT



IO module to monitor and control factory equipment



One of the main challenges in the factory digitization is collecting different types of data from existing, aged and heterogeneous machines in the factory floor. GadgEon's flagship product provides a way out to this.

Results / Outcomes

- Reliable, Simple, Industrial standard IO module with rigid casing to operate in rugged environment
- Rich in external interfaces - Analog input, Digital Input & Output, Relay output
- HTTP Web server interface
- Optical isolation for Analog & Digital inputs



System Description

Technology used :

PoE, TCP/IP, Web Server, Modbus TCP server, Modbus RTU Server

Interfaces available:

802.3af PoE, 10/100 Ethernet, RS-485, 1kV Isolated 8 Ch 24V Digital input, 4 Ch 24V Digital Output, 4 Ch 230V/2A Relay Output, 1kV Isolated 4 Ch 0-10V Analog Input.

Feasibility study and Documentation

- Requirements Gathering & Analysis, competitive product study,
- H/W Architecture development and finalization
- Component selection of all components and BOM management.

Hardware design(Schematics)

- Part selection to minimise noise interferences to inputs and output.
- Isolation of analog, digital input and output sections.
- Design done in view of passing certifications with proper EMC guidelines.
- Protection from ESD
- Tool: Cadence OrCAD Capture CIS

PCB design(Layout)

- Complex 4-layer PCB design of form-factor of 146x79mm.
- Intra and Inter Length matching and spacing for all critical interfaces.
- Critical placement & routing analog input and digital output to ensure optimum performance.
- PCB trace width to drive AC voltages and large current.



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Fab and Assembly House co-ordination

- DFM and DFA
- Preparing low cost CBOM's with low cost alternates identified for high cost parts.
- Life time check for components in BOM.

Bring-up and Testing

- Initial bring-up of the board followed by detailed Electrical interface verification and validation(EVT).
- Testing the firmware and web server application.
- Deployed in Delpheon platform
- Thermal testing

Firmware

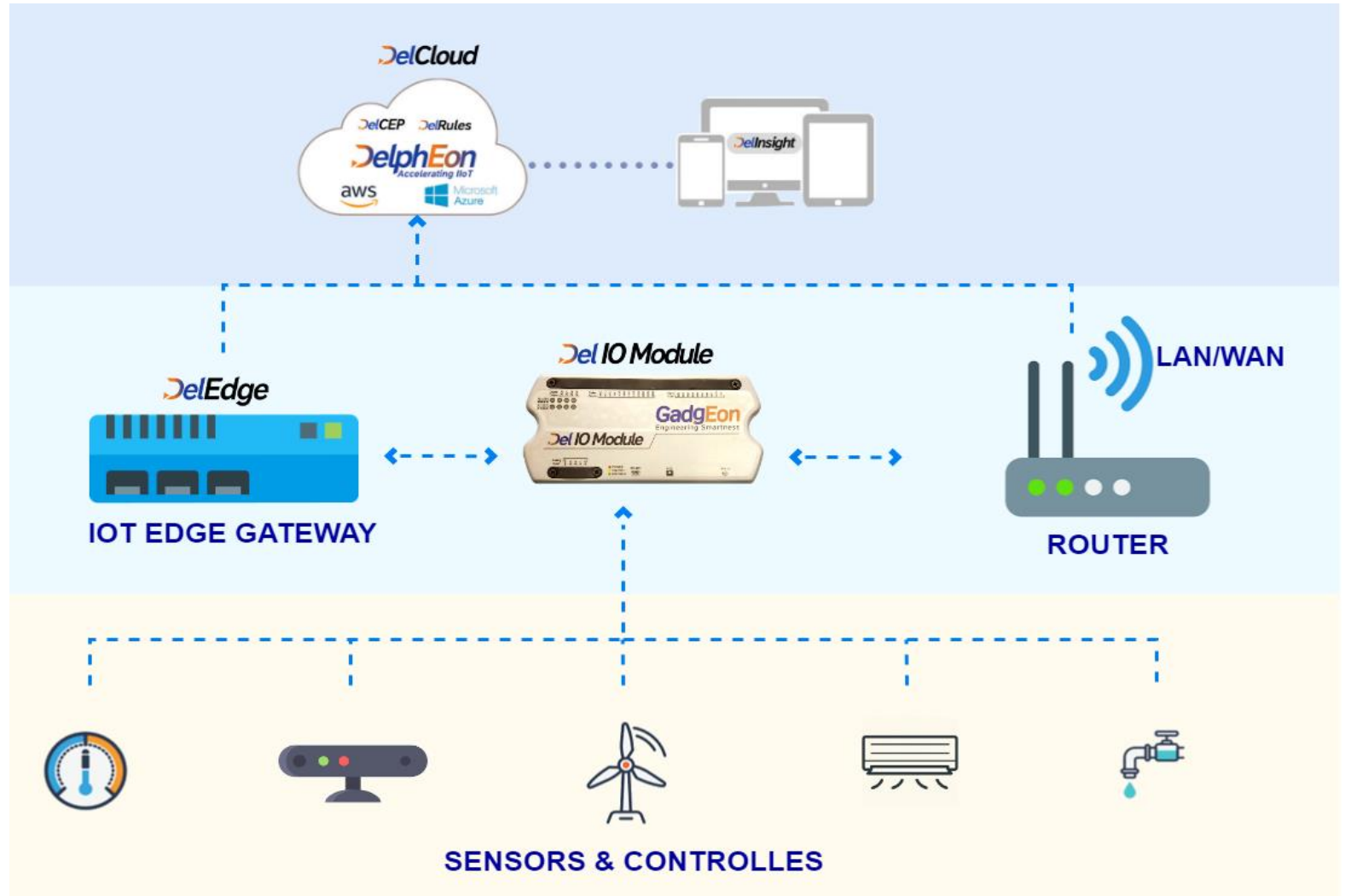
- Web server with configuration, IO status and firmware upgrade
- Modbus with multiple connection support.
- Modbus TCP/RTU slave/master support.



De-Io – System Context Diagram

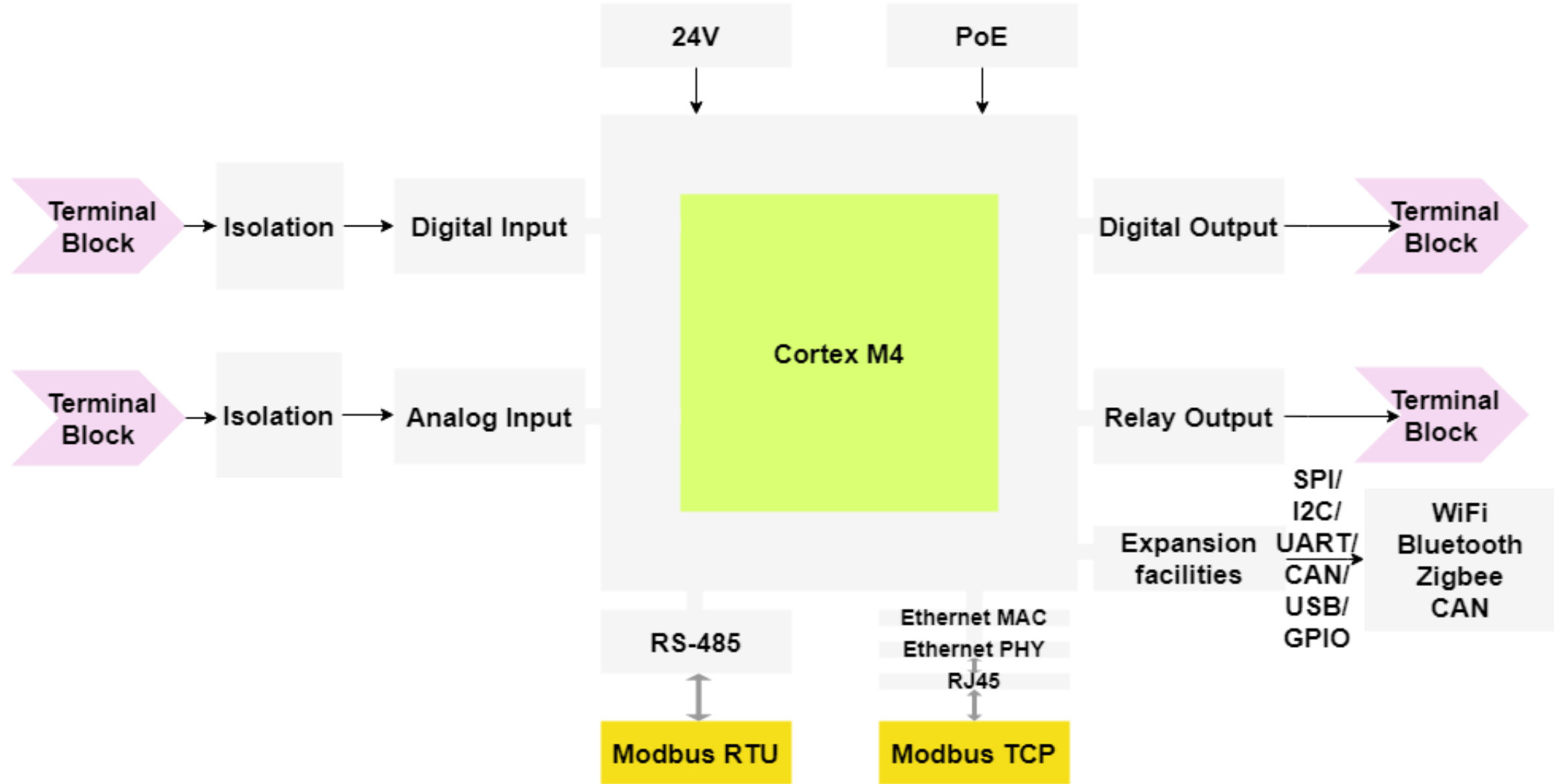
Mechanical enclosure & 3-D design

- Rigid Plastic enclosure with proper vents
- L*B*W = 170*90*50mm





De-I/O System Architecture



THANK YOU



For More Details, Let's Connect



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