

The logo for GadgEon, with 'Gadg' in blue and 'Eon' in orange.

Engineering Smartness

IO AGGREGATION CARDS FOR IIOT

Version 01



IO Aggregation Cards for IIoT



Design, development and productization of IO cards for IIoT with NXP microcontroller LPC15xx/LPC17xx fitting in to DIN enclosures

Results / Outcomes

- Designed and tested eight different types of IO cards communicating over a CAN bus
- Developed the manufacturing test software and production firmware
- Integrated CANOpen using CANFestival stack
- Intelligent edge solutions accessing, aggregating, transporting and analyzing data
- Complete end to end solution including data collection nodes, edge gateway, cloud application and mobile apps



System Design and Implementation Details

SI No	Category	Description
1	Interfaces availed	<ul style="list-style-type: none"> • CAN bus for Inter card communication, Ethernet and WIFI uplink for controller Node • IO nodes with Digital IOs, Analog Ios, Thermocouple Inputs, • ZigBee and BLE radios
2	Hardware design(Schematics)	<ul style="list-style-type: none"> • Card types developed – <ul style="list-style-type: none"> ○ Digital Input, Digital output ○ Analog Voltage, Analog Current ○ PT100, J / K, Radio • Controller node with ethernet and WIFI uplink to aggregate data • Cadence allegro, PCB manufacturing/assembly with European partner • PCB designed to fit in to off the shelf DIN enclosures
3	Board bring-up and Testing	<ul style="list-style-type: none"> • Initial bring-up of the board followed by detailed Electrical interface validation(EVT) including interface validation of Analog, Digital, Temperature, IOs, CAN and Ethernet interfaces • Prepared and documented the manufacturing testing for the product
4	Firmware Application development	<ul style="list-style-type: none"> • Production firmware was developed for all the boards with FreeRTOS real time operating system • Communication between the controller board and the IO boards was over the CAN interface • Can festival (CANOpen implementation) software stack was integrated into the Core board and the node boards • Cards required drivers for various devices like ADS1118 and ADS1247, temperature sensors, digital IO • Firmware download to IO nodes over the CAN interface

THANK YOU



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