



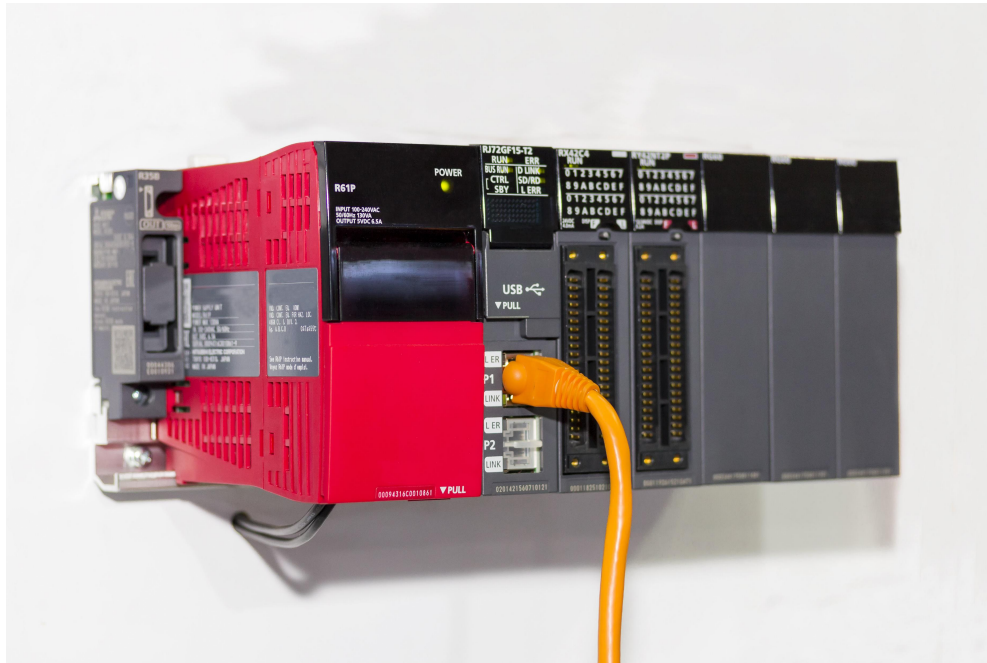
GadgEon
Engineering Smartness

IO and Aggregation Cards for IIoT

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

Interfaces:

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



Outcome

- 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

WHAT DID GADGEON DO?	PLATFORMS/ TECHNOLOGIES USED
1) Feasibility study and Documentation	<ul style="list-style-type: none"> ▪ Requirements Gathering & Analysis, competitive product study, H/W Architecture development and finalization, Firmware architecture development and finalization, Power requirement analysis via power estimation, component selection of all major components with CBOM with MOQ, LT etc
2) Hardware design	<ul style="list-style-type: none"> ▪ Card types developed – 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
5) FW 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
6) 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



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