



HART IP GATEWAY

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Version 01





HART IP Gateway



HART IP gateway provides a simple way for your regular wired dual speed and standard HART devices (9600/1200 or 1200 bps) to be connected to an IOT / DCS device over Ethernet/WiFi. It consists of a HART multiplexer (basic device) and HART protocol converter(add-on).

Solution Description

- 6L 1.6mm PCB design with mechanical constraints
- Modular & Small form-factor design – 99*80mm
- Interfaces – Ethernet, Wi-Fi, HART, LEDs
- Requirement analysis, Schematics & Layout design, Customisation of off the shelf Mechanical design, Firmware development
- Critical placement & routing to accommodate 4 HART modems, HART multiplexer in small form factor.
- One PCB design with two different assemblies for two products.
- Initial bring-up of the board followed by detailed Electrical interface validation(EVT)
- Easy configuration of Multiplexer using Web server

Outcome and Benefits Delivered

- Designed a system with high reliability, modularity and performance
- The system is undergoing field trials and a formal product certification process will follow



Hart IP Gateway - System Description

- 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., Customization of off-the-shelf mechanical enclosure

Hardware design(Schematics), Cadence OrCAD Capture CIS

- Critical placement & routing to accommodate 4 HART modems, HART multiplexer in small form factor
- Isolated designs for HART devices
- Part selection to minimal footprint as possible to accumulate all components for two products in required PCB dimensions
- One PCB design with two different assemblies for two products.

PCB design(Layout)

- Modular & Small form-factor design – 99*80mm, 6 layer 1.6mm thick PCB
- Complexity in routing all the interfaces for two products in tightly packed PCB
- Isolation plane cutting for HART devices

Fab and Assembly/BOM

- DFM and DFA reviews
- Low cost CBOM's with low cost alternatives identified for high cost parts, lifetime check for critical components in design including NAND and NOR flashes
- Manufacturing support with alternates identified for components going to EOL/obsolesce



Hart IP Gateway - System Description

FW development

- Operating System - RTOS
- Development of Bootloader and HART-IP Gateway application
- Web interface available for device configuration
- Implemented firmware upgrading logic for the TiVA processor
- Implemented stack-able architecture to interface upto 16 HART devices (One gateway and upto 3 add on boards)

Bring-up and Testing

- Initial bring-up of the board followed by detailed Electrical interface validation(EVT) including interface validation for the various interfaces

Mechanical and 3-D design

- Prepared the 3-D model of the board
- Customization of off-the shelf mechanical enclosure to fit for the two products

THANK YOU



For More Details, Let's Connect



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