



Block diagram of the IoT enabled Solar Energy Harvesting System

1 DESIGN AND DEVELOPMENT OF SOLAR TRACKERS

Hardware Design and consulting

- Consulting services for selection and design of the hardware platform and peripheral components
- Design of Communication Interfaces (Analog and Digital I/O ports) for :
 - Serial Communication: UART, RS232, RS485
 - Wireless Communication: ZigBee, BLE, 6LoWPAN and more
 - Wired Communication: Ethernet

Application Software & Back-Tracking Algorithm Development:

- Support for Design and development of the complete Solar Tracking Application software and RTOS
- Development and Integration of Solar tracking and Back-Tracking Algorithm
- Development of communication interface between Solar Trackers, Field-deployed IoT Gateway and Drive Control. This interface is designed based on TCP/IP, MODBUS, and Wireless protocols.

2 MOTOR DRIVE AND CONTROL SYSTEM

- Hardware Design & Consulting services
 - Consulting services for evaluation and selection of hardware components including Microcontroller, H-Bridge (MOSFETs), Gate Driver IC, Torque & Angle Sensors
 - Design and development of hardware for Brush DC and Brushless DC motors (BLDC)
- Development of Application Software & Motor Control Algorithm such as Pulse Width Modulator (PWM), Speed Regulation, Field-oriented Control (FOC) and more.

3 FIELD GATEWAY

- Hardware Design & Consulting services :
 - Requirement gathering and system analysis workshops with our IoT Consultants
 - Consulting services for evaluation and selection of microcontroller , high-performance processors & other hardware components
 - Architecture design and BOM cost optimization
 - Schematics and PCB designing
 - Prototype development and validation support
 - Support for Design for Manufacturability(DFM) and Design for Assembly (DFA)
 - Support for design & development of Interfaces for serial, wired or wireless communication along with :
 - Optional module for 4G/WiFi communication
 - Module for cloud communication, as per your business requirement
- Software Design & Development :
 - Support for Porting of the Linux based Operating System (OS)
 - Support for Local data storage and management
 - Integration with wireless/wired communication protocols based on TCP/IP, MODBUS, MQTT(for cloud communication) along with optional module for 4G communication
 - Application Software development on Linux Platform

4 CONTROL ROOM GATEWAY + HMI

- Hardware and Software development services for Control Room Gateway Device
- Development of operator and process centric HMI application with custom controls
- Support for standardized network protocols like OPC to enable communication with on-field devices

- Design and Development of Cloud-Based SCADA Solutions. Following are some of the features of the solution:
 - Built-in user-management framework
 - Zone/Site level management of plant operations for improved visibility
 - Advanced analytics & Report generation of field data
 - Data back-up management to ensure business continuity
- Design and development of IoT Cloud application including:
 - Cloud Web App and Mobile App Development
 - Cloud Database Design & Development
 - Support for IoT Data Analytics and Reporting capabilities
 - Development support for interfaces for cloud-device communication

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