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CASE STUDY

A customized, interoperable, and scalable industry-standard data acquisition system for Wireless Automation

An exploratory analysis of a product use case by System Level Solutions

SLS
System Level Solutions

www.slscorp.com

Smart Simplified Engineering

CLIENT PROFILE

The client organization is an Enterprise and Analytics solution provider working in fields of Industrial IoT, Wireless Automation, Enterprise SCADA and, MES and KPI based solutions. Keeping pace with the latest advancements in technology, they leverage IoT, Big Data, and Cloud-based Interface for powering their technology ecosystem and bringing about rapid modernization to avoid obsolescence.

Through years, they have catered solutions in fields of Asset Integrity, Energy Dashboard, Real-Time Manufacturing Dashboards, and Refinery Business Intelligence, etc. The company is spearheaded by a team of technocrats with over 25 years of experience in Industrial Automation and Embedded Automation Domain.

PROBLEM STATEMENT

INTRODUCTION

Wireless Automation has brought a revolution in the industry by harvesting a culture of remote analysis and control. The health of the heavy-duty machinery and factors like temperature, humidity, proximity, and occupancy play a significant role in the operational efficiency of the entire system.

Though wireless automation has disrupted age-long traditional ways of manufacturing, it faces challenges relating to the set-up of highly responsive and durable wireless sensors, and the establishment of a cloud-based secure communication network for remote analysis and control. The production of such hi-tech hardware and software becomes a great challenge for businesses catering solutions in the field of wireless automation.

CHALLENGE

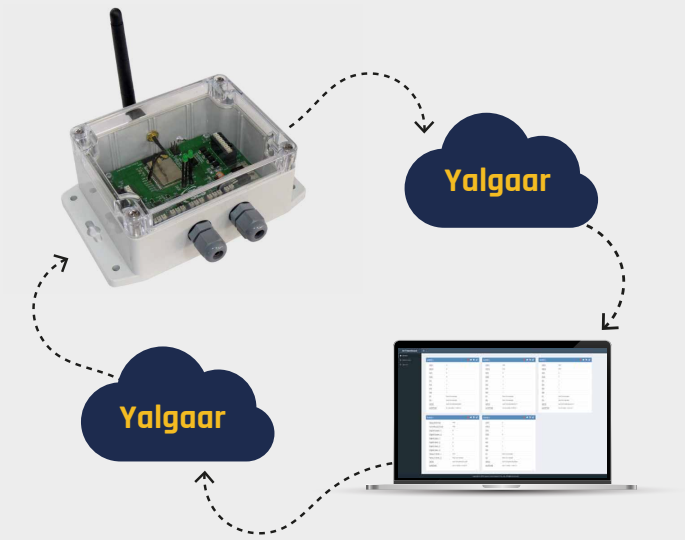
The client is a solution provider in the field of wireless automation, among other things. Their existing solution was not designed to be retrofit as it required different sensors for varied use cases of wireless automation in industries. The nature of their solution was ever-changing, because of which they faced the following major challenges:-

- Requirement of different sensors for retrofit environment
- Time constraint for R&D of sensors as per retrofit environment
- Avoiding wiring in hardware upgradation
- Risk of batch and production failure on field
- Real-time alerts of field sensors

Another challenge faced by the client was reading different sensor data on periodic requests over Analog Input channels having flexibility from 4-20mA and 0-10V, and transmitting this data on a cloud server using Wi-Fi, round the clock.

OUR SOLUTION

SLS gathered in-depth information about the client's existing infrastructure to propose relevant solutions. The biggest challenge was the shortage of time to manufacture and implement a customized solution that fulfilled all the gaps faced by the client.



NebuLink Controller NLC1242 and Web Dashboard

CHALLENGES FACED BECAUSE OF TIME-SENSITIVITY

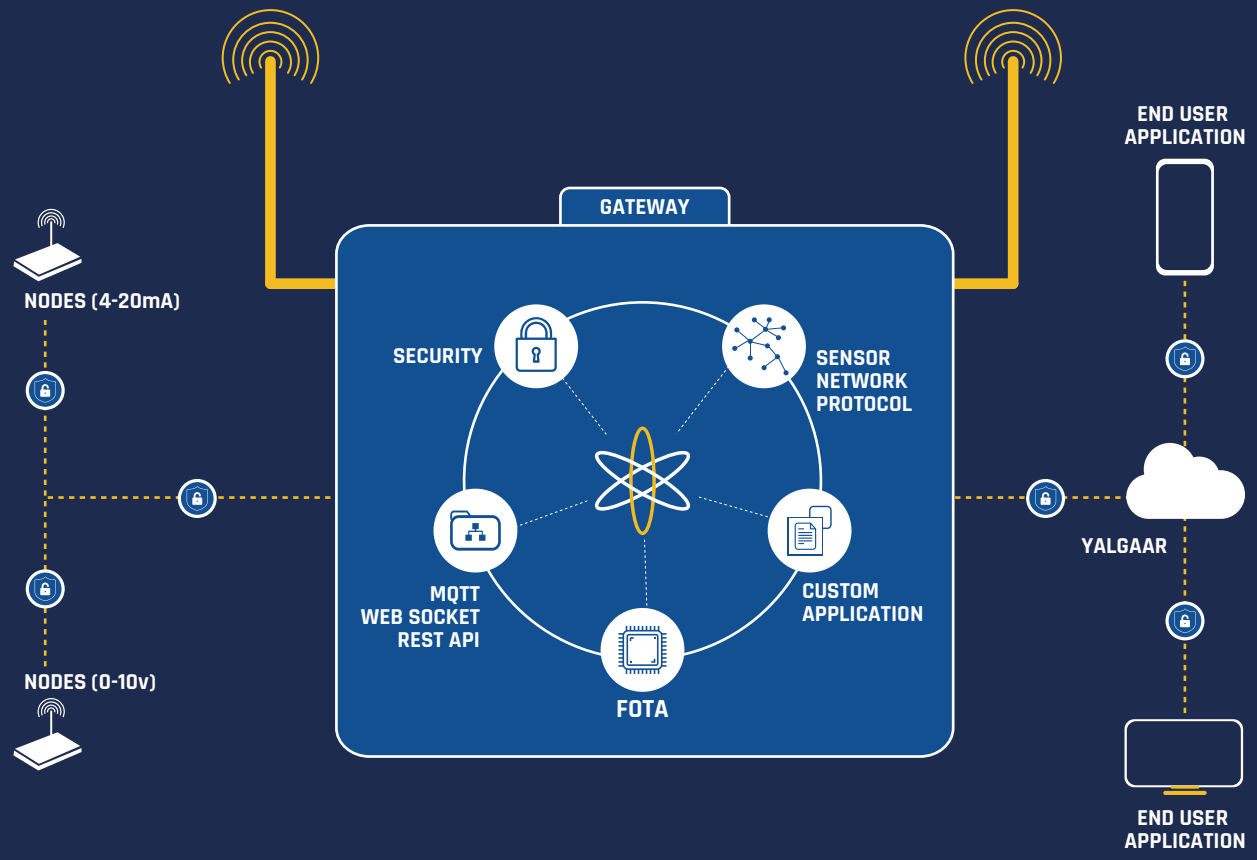
- Manufacturing of hardware and software which is tested for Quality Control (QC) with IP65 enclosures
- Delivery of a cloud portal hosted on the client's server with FOTA mechanism to automatically update the firmware through Over-The-Air feature
- Secure wireless connectivity in harsh industrial environment
- Real-time update on sensor activity
- Flexible sensor integration for 4-20mA and 0-10V
- In-built I/O Protection

SLS manufactured and delivered an industry-standard data acquisition system with inbuilt sensors and the capability to transfer information wirelessly to the cloud and connected dashboard. The IP65 enclosure hardware was QC tested and could measure all the parameters of temperature, humidity, occupancy, and proximity very accurately.

To further supplement the solution, SLS proposed to integrate it's Yalgaar framework to establish real-time pub/sub messaging capabilities and presence notification feature for fetching live online and offline device status. The solution also accompanied offline data storage capability with a 2MB flash.

The solution is a combination of hardware and software which is low-cost, low-maintenance, and allows seamless integration into the client's existing solution. It is easy to use, compact, and a complete package for industrial use cases.

ARCHITECTURE DIAGRAM



TECHNICAL SPECIFICATION

PRODUCT : Customized NebuLink Controller

- **End-user cloud application Supported:** Yalgaar SDK

- **ELECTRICAL SPECIFICATION**
  Power Supply: 16 - 28 VDC @ 4A
  Operating Temp: - 40 to 85 °C

- **GENERAL**
  LEDs: 2 x Status LED, 1 x Power LED

- **I/O INTERFACE**
  Analog Input: 2 Channels, 12-bit 0-10V, 4-20mA
  Digital Input: Isolated 4 Channels, 24VDC
  Digital Relay Output: Isolated 2 Channels, 24VDC
  1 Wire Digital Input: 2 Channels, 3.3VDC

- **COMMUNICATION INTERFACE**
  Wi-Fi: 802.11 b/g/n AP/STA mode

 | **Email:** info@slscorp.com