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# Industrial Internet of Things Monitoring Solution for Advanced Predictive Maintenance Applications

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## Abstract

Internet of Things (IoT) solutions in industrial environments can lead nowadays to the development of innovative and efficient systems aiming at increasing operational efficiency in a new generation of smart factories. In this direction the article presents in detail an advanced Industrial IoT (IIoT) solution, the *NGS-PlantOne* system, specially designed to enable a pervasive monitoring of industrial machinery through battery-powered IoT sensing devices, thus allowing the development of advanced predictive maintenance applications in the considered scenario. To the end of evaluating the performance of the developed IIoT system in a real environment, the *NGS-PlantOne* solution has been first installed and then set in operation in a real electricity power plant. The deployed testbed, based on 33 IoT sensing devices performing advanced temperature and vibration monitoring tasks, has been kept in operation for two months while evaluating transmission delays and system operating life through power consumption measures. Performance results show as the developed IIoT solution benefits from all the advantages provided by the adopted IoT protocols, guaranteeing that each node is reachable through simple IP-based techniques with an acceptable delay, and showing an estimated average life of 1 year in case of each IoT smart device is configured to send collected and elaborated data every 30 minutes.

*Keywords:* Industrial Internet-of-Things, Smart Plants, Industrial monitoring.

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## 1. Introduction

In the last several years the continuous advancements in the electronic field, as well as the development of new high performance and cost effective wireless

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