

INTELLIGENT BOLT LOOSENING AND TILTING MONITORING SYSTEM

01 Introduction

In key industrial fields such as wind power, rail transit, mining, energy, and steel structures, bolts are the core connecting components that carry loads, transmit power, and ensure structural safety. During long-term operation, factors such as continuous vibration,

alternating loads, temperature changes, corrosion aging, and geological settlement of equipment can easily lead to hidden dangers such as bolt pre tightening force attenuation, loosening, and fatigue fracture. The traditional method of relying on manual inspection and regular tightening has problems such as inaccurate detection, high missed detection rate, and inability to provide real-time warning. Mild cases can cause equipment downtime, loss of output, and a sharp increase in operation and maintenance costs, while severe cases can lead to major safety accidents, posing a serious threat to production safety and asset efficiency. Realizing online monitoring, intelligent warning, and predictive maintenance of key bolts has become an urgent need for industrial safety and efficient operation.



02 Product Scene Display

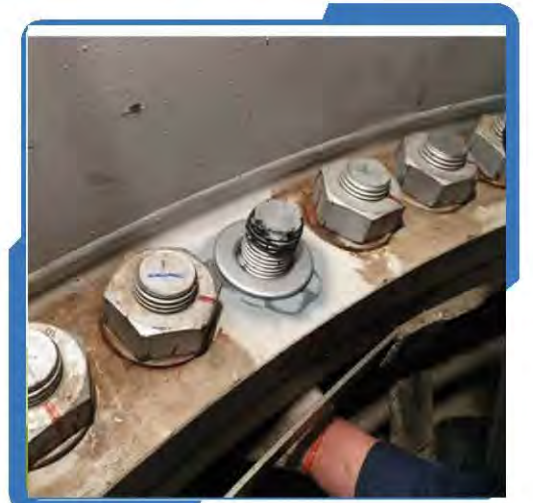
Urban rail transit

The bolts of railway tracks (such as rail joint bolts and sleeper bolts) are subjected to high-frequency vibration and impact loads caused by train traffic for a long time, with dense point restriction high missed detection rates.



Wind power

The periodic vibration generated by blade rotation and the shaking of the tower under strong winds are the main causes of bolt loosening.



Industry equipment

The continuous vibration generated by the high-speed operation of the equipment can cause the bolts to gradually loosen. Mild cases can affect product processing accuracy, while severe cases can cause equipment shutdown and result in significant economic losses.



Energy equipment

Key bolts are prone to loosening and failure due to long-term exposure to strong vibration, high pressure, and strong corrosion conditions. Failure to provide early warning can result in production stoppage and loss of efficiency, or serious accidents such as leaks and explosions.



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tower

Bolts on wind turbine towers tend to loosen under the combined influence of wind loads, ice accretion, and temperature changes. Since the loosening points are densely distributed and hidden from view, it is very difficult for manual inspections to catch all of them, resulting in an unacceptably high missed detection rate.

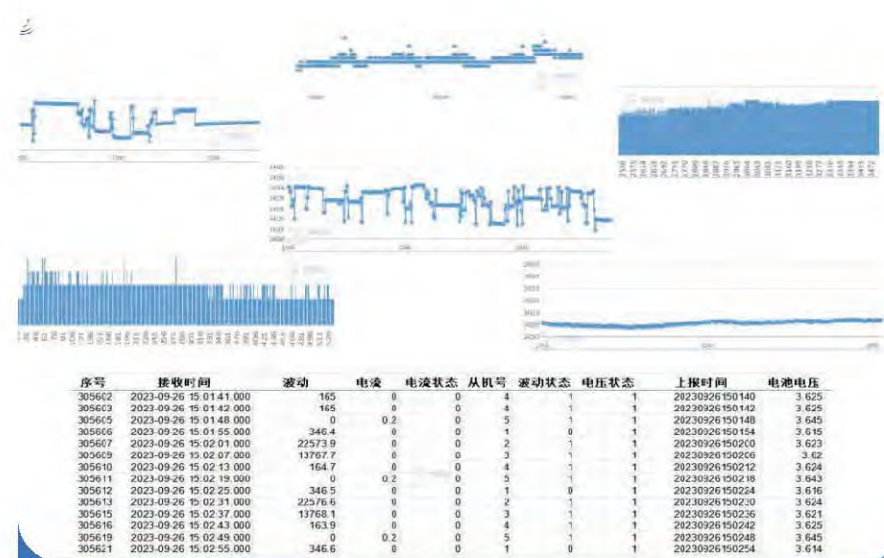


Mining

The equipment is subjected to 24-hour heavy load and strong vibration, and the environment is complex. It is difficult to detect manually, which directly affects production. The danger factor of underground operations is high, and the risk of personnel inspection is high.



03 System Advantages



Graded alarm

Visual terminal



Synchronize cloud platform



Waterproof and dustproof