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MiCRANE

Ideas For Crane

Digital
Spreader System

Brief Introduction:

Spreader, with the highest utilize classification, it's function to a container crane is as important as the hands to a human being. Its reliability directly affects a terminal's productivity. Spreader is also one of the devices with the most complicated structure at a container terminal and its working environment is also the toughest (heavy shocking and frequent operation). Statistics shows that more than half of the faults of a terminal originate from the spreader. Therefore, the healthy state of a spreader is closely related to a terminal's operational efficiency.

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Equipment
Touch Control

MiCRANE digital spreader system is a spreader management tool we have developed based on the experiences of a couple of outstanding container terminals and spreader manufacturers. It provides detailed guidance to spreader status monitoring, maintenance, repair and troubleshooting on a point-to-point basis. It has been proofed that the tool will substantially reduce the fault rate of container terminal spreaders.

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Spreader Status Monitor:

The crane has to stopped In case of a spreader fault happens during crane operation. In particular, the fault of a STS spreader will delay the container vessel schedule and the storage yard schedule. As such, quick trouble shooting is particularly important in case of spreader fault. MiCRANE digital spreader system can display the real-time status on the PC or cell phone via the MiCRANE IoT. The users can even check the PLC program, also refer to the historic fault record and learn the troubleshooting methods. These features are highly effective for quick troubleshooting of a spreader. Everything is controlled in the user's palm.
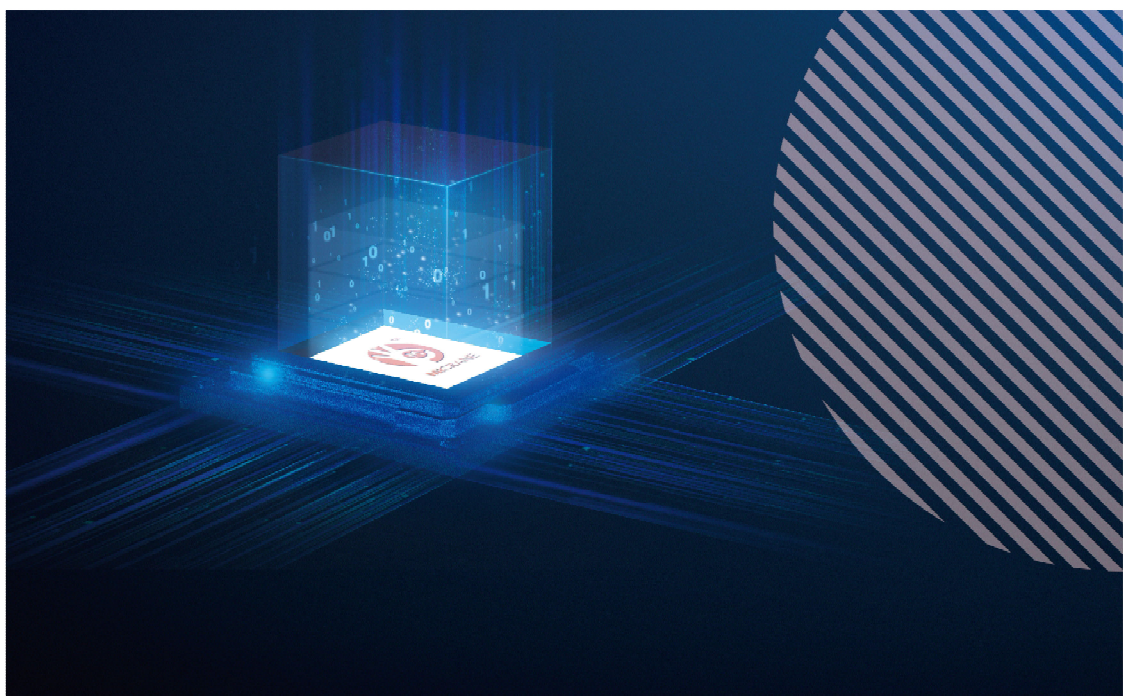
● MiCRANE Cloud Box:

MiCRANE cloud box is a bridge between spreader and user. With a special design, the cloud box is integrated with GPS, 4G/5G communication and PLC communication. It is quakeproof and waterproof and adaptable to the tough working environment of a spreader. It has a communication frequency of once per second to ensure the user can see the changes in spreader status.

● Real-time Status:

MiSTATUS displays the real-time operating status of a spreader on the user's PC or cell phone so that limit switch status, command and execution status are readily available. These status are directly and vividly displayed in both texts and graphs. MiSTATUS also enables replay, by inputting the time to check the historic operating status.

● Remote Monitoring PLC Program:

Via MiCRANE cloud box, the user can remotely monitor the spreader's PLC program via a PC terminal, thus ensuring the troubleshooting of the spreader.
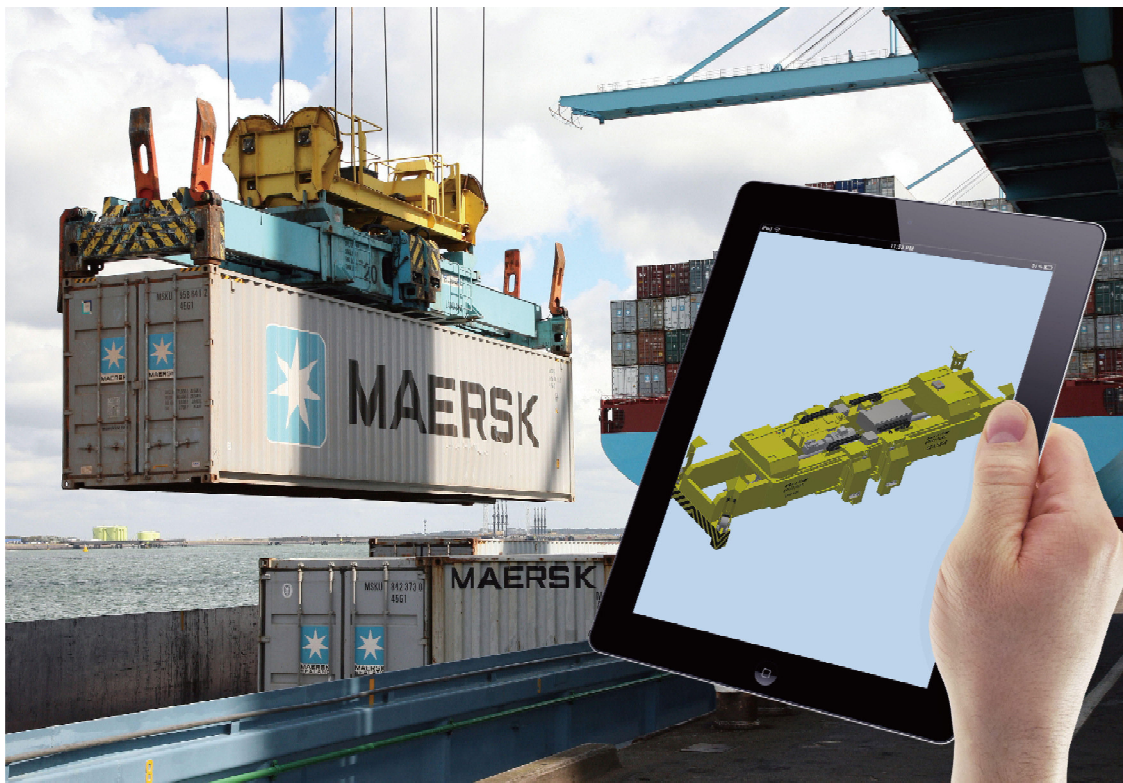
● Fault Management:

In case of any spreader fault, a message will be sent to MiCRANE right away so that the users can immediately settle the trouble. MiCRANE further makes a statistic analysis of the historic fault message so that the user can refer to historic troubleshooting methods and experiences during troubleshooting.

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Component and Maintenance Management:

Component and maintenance management are two core parts of MiCRANE spreader digital manual, which are expected to assist the engineers to keep the spreader in the best condition at any time. Detailed component information is readily available through MiCRANE visualization interface, and the proper maintenance plan is easily implemented through digitalized management schedule.

Cloud Components:

The component information of the MiCRANE digital spreader system has been established by professional engineers. Its detailed content, visualization and 3D navigation realize the goal of "WYSIWYG (what you see is what you get)". Drawing, manual, photo, brand, model and other information are readily available. Rule-based naming and numbering systems and cross-verification of various types of information make it possible to share components within the same group and even nationwide, thus realizing the so-called "cloud component". The cloud component system lays a solid base for the fast acquisition of components and sharing of resources.

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Residual Life Prediction:

Upon initial use, the system sets the life cycle and relevant factors of each component. MiCRANE can forecast the residual life of each component according to the spreader's operating data acquired from the cloud box. When the residual life falls below the prescribed level, it will give out a pre-warning and notify the user to prepare necessary spare parts to avoid stop of operation due to sudden failure of the component.

Alarming Maintenance:

The maintenance schedule is bundled to the corresponding object, which will be actuated by relevant preset factors on time, MiCRANE digital spreader system will perform closed-loop monitoring of the plan and confirm it upon completion of the plan, then the system will start the next cycle of maintenance. Meanwhile, the system will evaluate the timeliness of the plan execution by scoring, this score could help the engineer optimize his working plan (to complete the delayed plan first), This is what we call "Alarming Maintenance".

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● **Point-to-point Maintenance Guide:**

MiCRANE provides a specific maintenance guide for each part that need maintenance, specifying in detail the safety precautions, time interval, technical method, scope of work and quality requirements. The guide is bundled to its specific object, and readily accessible by simply clicking any where any time.

Health Management:

Score the health state of the spreader in all aspects (scoring is one of the most important features of MiCRANE), MiCRANE adopts mathematic methods for health management. A statistical analysis of the score allows analysis and forecast of the component's health trend. The components with a poor health state may also be screened out through filtration, which help users locate the poor condition component and fix it, this is the MiCRANE way to keep each component in a healthy state.