Remote Crane Control System

Cranes form one of the major equipments in industries of all kind – from domestic industries to naval yards to warehouses. In most of these places the productivity of the activities depends on how efficiently the crane is managed. More over these cranes being used for 24 hours a day, even a short down time greatly affects the operations of the plant. In general these are some of the problems that usage of a crane poses:

1) Availability of skilled labour to operate the crane
2) Restricted number of hours an operator can work on a crane – Due to safety regulations an operator is generally not allowed to work for more than around 6-8 hours on huge cranes due to the fact that the operator needs to work at a height of around 25-30 metres. Due to this nearly three to four operators are required to work in shift to run the crane 24 hours a day.
3) Safety hazards due to bad visibility – On huge cranes where the operator sits on the crane to operate it, his vision gets blocked because of the height at which he works. Due to this not only does his efficiency drop but also there is a high risk of the crane causing harm to human life as well as property due to improper operation.
4) Safety hazards due to long hanging cables – On smaller cranes the operations are controlled by a "Pendant" that hangs down all the way from the crane. Due to this there is a hazard of this cable getting entangled with other equipment and causing loss to human life and/or property.

To solve the above and many more such problems, Sunlux Technologies Ltd. presents a unique, hi-tech and a very efficient method of crane control – The Remote Crane Control System. This system is based on Radio Remote control of the crane and has the following components:

1) A **microprocessor based remote pendant** with Liquid Crystal Display (LCD) and necessary buttons to operate the crane. This pendant also has software embedded into it to communicate with the crane controller. This unit is fully operated on battery and is compact and portable enough for the user to operate it with his hand. This unit receives the necessary commands from the user to operate the crane and transmits the same to the crane controller. The LCD display keeps the user informed about the commands being issued and other diagnostic messages.
2) The **Crane Controller** – This is a fully embedded microcomputer running a real-time operating system which receives the commands transmitted by the hand-held pendant and controls the crane accordingly. This unit has the necessary inputs and outputs to activate the motors of the crane in the requested speed and direction. Besides communicating with the pendant, the controller also runs the necessary logic to implement interlocks. Thus it prevents the operation of the crane when a user gives some erroneous command. The real-time operating system used enables the controller to react to the commands sent by the pendant in real-time.

3) A third optional component which greatly enhances the power of this product is the **"Antisway Control"**. A lot of time is lost by crane operators in trying to bring the load connected to the crane to a standstill i.e. to make the crane stop **'swaying'**. The sway occurring in the load also prevents the operator to run the crane at its maximum speed. Sunlux is in the process of developing an add-on product to the Remote Crane Control System with which the embedded real-time controller operates the crane in a manner as to cancel the sway of the load. It also enables the operator to run the crane at its maximum rated speed. This module will be available for customers by the end of December 2001.

The diagram below shows the architecture of the Remote Crane Control System.
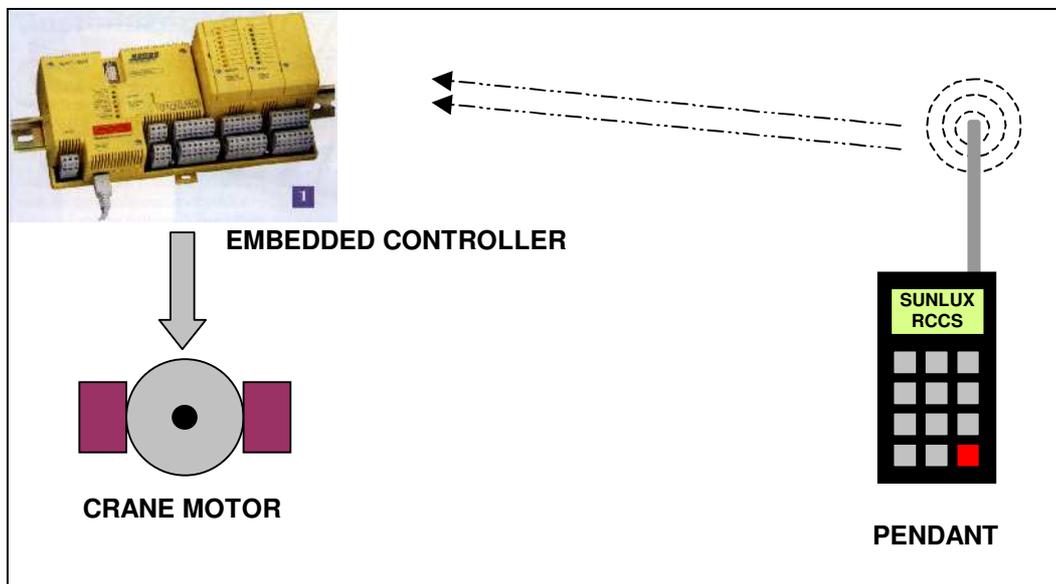
Salient Features:
1) Based on real-time control system
2) Wireless operation of the crane
3) Can be installed on new as well as existing cranes
4) Enables efficient use of cranes without losing time
5) Enables safe operation of cranes
6) "Antisway" optional component available for sway free operation
7) Runs on a real-time operating system
8) User friendly operation with display on pendant
9) Software interlock handle human errors in operation
10) High scalability due to modular design
11) Many installations already running successfully