SIRRAH - precision sensors for harsh conditions

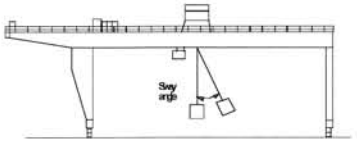
Within the transport sector time usually equals money. Using the SIRRAH from ARCK ELECTRONIQUE S.A. has made it possible to shrink the average transfer time for container handling in ports by 10%. Two major steps were taken at ARCK to modify the earlier manual procedure of positioning of containers into a semi automatic precision operation. The first was to use a SiTek PSD to meet the sensitivity, precision and speed requirements. The second step was to integrate all necessary parts, sensors, electronics, infrared transmitters, etc into a rugged heavy-duty, high-reliability construction intended for such harsh environments as harbours.

Product description

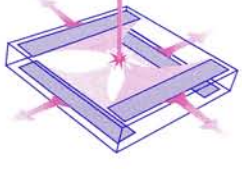
SIRRAH is a sensor that measures the angular positions of a mobile infrared transmitter. The position co-ordinates are given as a deviation from the sensor's optical axis. SIRRAH is waterproof and insensitive to ambient stray light and intended for outdoor use on container bridge cranes or overhead travelling cranes in applications like sway measurement and load positioning. An active beacon is used as BMA for the tracking of the gripping tool or spreader. The beacons mark the points to be tracked and function independently of the SIRRAH sensor. Using a pulse-modulated near-infrared light permits the beacons to function over a large distance.

Main applications

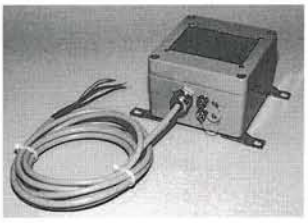
Load position control - sway measurement and skew control of cranes.



A SIRRAH sensor mounted on the bridge of a crane trolley detects the x and y position of a beacon located on the hook of the spreader. Any movement (sway) of the load is contained in the sensor's output signal. Thanks to the fast response of the detector it is possible to use the signal as feedback in a sway readjustment loop.
It is also possible to simultaneously measure the position of more than one beacon. This allows for the calculation of - and compensation for - the rotation or twist of the load or calculating the distance to the load. The number of beacons used increases the accuracy of the measurements.

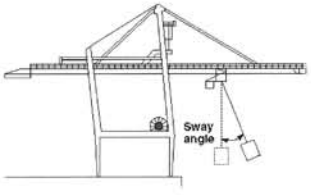


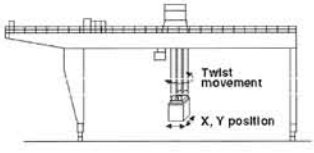
The whole sensor is integrated into a box together with the infrared receiver and the electronics for processing the measured x and y positions of the beacons. A calculator or a PLC can be linked with the sensor through a serial interface.



Other applications

SIRRAH can be used for measuring and controlling any moving vehicle i.e. civil engineering power plant, tunnel drillers, moving robots, etc. In these applications the sensor can be mounted on the moving vehicle directed at beacons at fixed locations in the surroundings. If three or more beacons are used it is possible to calculate the x and y position as well as tilt. In some applications involving a vehicle moving along a straight path this scheme may be reversed. The beacons can be mounted on the top of the vehicle and the sensor can work from a fixed position in the surroundings.





Main technical characteristics

Numerical resolution :	1/1000 degree on two axes
Better linearity :	1/100 degree on two axes
Working range :	up to 60 meters
Angle of view :	+/- 6° or +/- 9° (other upon request)
Measurement rate :	200 Hz
Robustness :	for outside use in harsh environment
Interfaces :	RS 422 directly connected to computer

Manufacturer

ARCK ELECTRONIQUE SA, TOULOUSE FRANCE
The company specialises in optical sensors for industrial uses. Its field of activity mainly relates to position and trajectory metering with different types of products to measure angle position as well as distances. SIRRAH products are now in operation from Los Angeles (USA) to Singapore (Singapore), Bremen (Germany) and Durban (Rep. of South Africa).