



Remtron Technical Note

Safe-T-Range™ - Controlled Range System

With the advent of lower-cost wireless control systems for material handling equipment, end users are becoming increasingly aware of the potential for cranes to be operated from unsafe distances. Today, most wireless remote control manufacturers are offering their equipment on high frequency, unlicensed bands that don't require the complicated licensing procedures of the past. With higher frequencies comes the ability to operate a crane from a distance of 300 to 1000 feet, which has caused some companies to search for a solution to this safety concern. An increasing number of companies' industrial safety departments are requiring range-limited controls for the safe operation of their cranes, machinery, and other material handling equipment. New solutions have been developed that offer different ways of controlling the distance at which the operator can operate the crane. The following are a few of the techniques now available:

Infrared Control – Infrared control is commonly used in household consumer items such as remote-controlled TVs, VCRs, and stereo equipment. With infrared control, in order to maintain control, the operator must keep in constant contact with the crane by physically pointing the transmitter at one or more infrared eyes on the crane. While this is effective, infrared control still has long-range capabilities, and the requirement to continuously point the transmitter at the crane is often seen as a safety concern in itself. Infrared control is also susceptible to plant dust and bright light such as sunshine, which can interrupt signals and cause crane movement to be stopped intermittently.

Infrared Start/RF (Radio Frequency) Control – Controlling the range is also popular in Europe, where a technique called Infrared Start/RF (Radio Frequency) Control is used. This technology uses an infrared transmitter and receiver to start the crane main line contactor. Once the crane is started, long-range radio frequency is then used to control the crane motions. While this is believed to be a better way of controlling a crane, limitations still exist. Specifically, the tendency is for the operator to start the crane in close proximity to it but then operate it at a much farther distance, which defeats the purpose of keeping the operator close to the crane at all times. The shortcomings of infrared are again an issue with this type of system.

RF Range Control – The industry has shown that radio frequency control is the preferred means of controlling a crane and other material handling devices. RF is able to transmit “around corners” and is free from the issues of dirt or other airborne particles. However, with the very low power of today's unlicensed transmitters and the very high frequencies that are being used comes a very long-range signal that is difficult to control. But with today's microprocessor technology, manufacturers are able to manage these RF signals to the end benefit of the operator and their safety.

Remtron offers an RF-controlled range system called Safe-T-Range™ that is not affected by modern automation devices like Variable Frequency Drives (VFDs) or electronic discharge machines commonly used in manufacturing processes. The system can be custom-adjusted to the end user's range requirements, usually in the 30 to 100 ft. range. The Remtron receiver monitors the power of the signal received from the transmitter to determine the distance between the operator and the equipment. The receiver may be programmed to allow an operator to leave his “safety circle” only for a short time period before he must return to the safety zone. An indicator light or horn tells the operator he is out of range and must return to his “safety circle” of operation. If he does not return, the crane is brought to a safe stop. The end user can decide which functions he wants to range control. For example, an operator may need controlled range on the Hoist and Trolley but need a long range on his bridge motion for calling the crane from the end of a long bay. Of course, all safety functions may remain enabled even if all other functions of the crane are range-inhibited.