Proximity Detection and Distance Measurement for Manufacturing Conveyor Systems

The Challenge

Conveyor systems are used extensively in vehicle manufacturing and other industries to move large parts and assemblies through a variety of steps on production lines. Various system formats exist, primarily overhead monorail conveyors, floor conveyors, and automatic guided vehicles / carts (AGV/AGC).

Regardless of the conveyor technology that is used, operators share common needs. Guidance systems are required to ensure proper circulation and placement. Moreover, safeguard systems must be in place to provide protection and prevention against accidents, thus ensuring the safety of workers and preventing damage to expensive, mission-critical machinery. Any incident on a single production line can have a significant impact in terms of induced costs and manufacturing delays.

A monorail conveyor manufacturer was experiencing performance and reliability issues with the current detectors used in its systems. The company turned to LeddarTech for a compact sensor that could be quickly integrated into existing systems to ensure that products moving through the production line on the conveyors remained at a safe distance from each other.

In these overhead monorail conveyors (also known as suspended or overhead conveyors), each individual conveyor is equipped with its own motor drive and controller so that it can move independently. In such systems, the distance between transported items must be monitored constantly in real time and maintained above certain minimum values to avoid any safety risks and potential damage.

In this context, an efficient detection and ranging solution was required to perform consistently in harsh, dusty environments as well as withstand the movements, shocks and vibrations induced by the conveyor system itself.

LeddarTech's Solution

For this particular application, the LeddarOne Sensing Module is particularly effective as it is small enough (2") to be easily incorporated into an individual conveyor train. The advanced optics in the LeddarOne—with its focused, yet conic beam—allow it to precisely detect objects and measure distances in the 0 to 65 ft. range. Moreover, its low price point makes it an excellent option, considering that multiple modules are required for this application.

The LeddarOne single-element sensor module:

- Provides excellent detection range
- Takes accurate and repeatable distance measurements in real time
- Performs well in harsh environments, as its LED diffused light source makes it immune to ambient conditions
- Offers best overall performance for the price, compared with other detection technologies

The Outcome

The customer integrated the LeddarOne into their large monorail conveyor controllers, fitting a sensing module in each conveyor train section. The LeddarOne was installed pointing forward (in the direction of the motion) and interfaced with the controllers to accurately detect/measure how far the next conveyor is and how fast it is going, thus ensuring no collisions and keeping product and equipment damage to a strict minimum.

Product References

- LeddarOne Sensing Module