

The Delta SM-3000 Sorting Module

Overview

The SM-3000 Sorting Module determines the color and length of objects at resolutions as small as 1/32 of an inch at product speeds up to 500 feet per minute.

The SM-3000 has two operating modes: Batch and Continuous. Batch mode is typically used for quality control testing of consistent size groups of objects. In Batch mode, objects are classified and totaled based on preprogrammed categories. Objects are usually not diverted in Batch mode.

In Continuous mode, reports consist of histograms of length and/or color based on configurable time periods. In Continuous mode, the SM-3000's eight high-speed discrete outputs can be used to activate diverters which separate product according to color or length.

Key Features

- Measures length of objects moving as fast as 500 ft/min with a 1/32 inch resolution
- Measures color of objects in up to three different areas of the light spectrum
- Automatically adjusts to changing ambient light
- 100,000-hour life LED lighting system
- One-sided viewing permits easy top-only mounting arrangement
- High speed discrete outputs can be used to activate diverters to separate product
- Remote computer interface ties the SM-3000 to a plant's process control system

Object Detection

The SM-3000 analyzes light from high intensity LEDs (Light Emitting Diodes). Up to three colors can be used from a selection which includes blue, green, yellow, red, and 880nm and 940nm NIR (near-infrared) wavelengths.

Objects can be viewed either on a belt or in mid-air as they trajectory off the end of a belt. Using adaptive techniques, the SM-3000 analyzes the difference between background and object light levels. An adjustable threshold on the NIR amplitude is typically used to detect presence of

objects. Additional thresholds are used on the ratios of other colors to sort by color.

Scanning Range

-- Up to 1.5" vertical and horizontal

Scanning Area

-- Down to 1/32" by up to 1.5"

Stand Off Distance

-- 4.5" to 6.0"

Light Source

-- 450nm (blue) to 940nm (near-infrared)

Response Time

-- 220us

Object Size

-- Objects should have a uniform surface area equivalent to a 1/4" diameter object

Object and Background Color

-- To successfully detect objects, the background (area scanned when object is not under the sensor) reflected light should be less than one-third of the normal object light. If you have any questions concerning the detectability of your object(s), Delta will gladly examine your samples to help determine the best configuration for your application.

Information Access

Data Collection Modes

-- Continuous or Batch modes

Portable Terminal

-- A 4x20 LCD hand held terminal provides local access to data used by operators and maintenance personnel. The terminal can be located up to 50 feet from the sensing location. Displays can be modified to your application.

Remote Computer Operation

-- Both Kermit and Modbus serial protocols provide access to the database. Each can be configured to work over RS-232 or RS-422 data lines. This link allows you to set parameters and get results from a remote computer.

Optional Windows Interface

-- This option can display management information on a PC. Specific Windows-based displays can be developed or a DLL Windows driver can be provided to support your needs.

Miscellaneous Information

General I/O

-- Up to eight optically-isolated inputs or outputs

Encoder Interface

-- Optically isolated, 5kHz maximum frequency

Power Requirements

-- 120VAC @ 0.5A

Ambient Operating Temperature

-- 0-45 degrees C

SM-3000 Enclosure

-- 12" x 10" x 6" NEMA 4X fiberglass

Portable Terminal Enclosure

-- NEMA 12 (optional NEMA 4X available)

Ordering Information

Pricing for a single unit starts at under \$10,000. Please contact Delta for details.

License agreements provide Delta with the exclusive rights to use the SM-3000's sensing technology in all applications outside of frozen potato processing. Should you have any questions, please contact a Delta representative.