

# 10XAS-Series Sensors

for edge/centerline position & length and width measurement

## Overview

SCAN-A-LINE™ 10XAS-Series Auto-Sync Sensors from Harris Instrument Corporation provide highly reliable and accurate position and width measurement for strip guiding and width control systems. The 10XAS-Series sensor is a non-contact, electro-optical sensor designed primarily for the edge position detection of strip materials.

Because of its versatility and reliability, the 10XAS-Series is one of the most **cost effective** edge position & width measurement sensor systems on the market today.

The new B-type aluminum standard enclosure provides excellent dust and moisture protection for most environments. The optional ULTRA-TOUGH™ enclosure is designed for harsh environments found in steel mills and other



Model 10XAS-10E-B Emitter—Standard Enclosure

## Options & Configurations

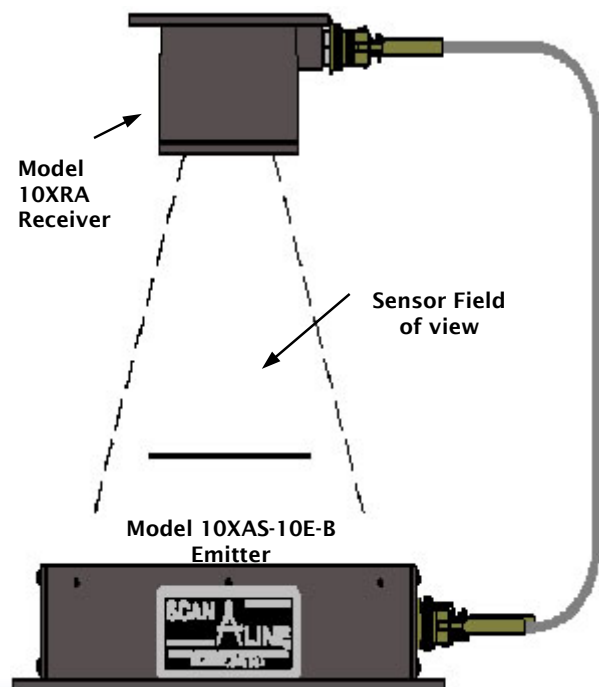
|                                               |                                                                                                                                                                   |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Standard Configuration</b>                 | Provides highly efficient edge detection for edge guiding, centerline guiding and dimensional measurement.                                                        |
| <b>Clear Materials Option</b><br>(CLR Option) | Allows for the edge detection of clear, translucent or loosely woven materials. Requires On-Line Balance Option.                                                  |
| <b>ULTRA-TOUGH™ Option</b><br>(UT Option)     | Provides excellent crash protection with thick cast aluminum housings and borosilicate viewing windows along with sealed connectors and stainless-steel hardware. |
| <b>Infrared LED's Option</b><br>(IR Option)   | Permits the 10XAS-Series sensor to operate with light sensitive materials. Also provides for operation in very hazy or smoky conditions.                          |

## Features

- Available in six sizes: 10" [254mm], 20" [508mm], 30" [762mm], 40" [1016mm], 50" [1270mm] and 60" [1524mm] for single or dual sensor systems.
- Compatible w/ most SCAN-A-LINE™ processing units including: GPU, PCPU, TCPU, DCPU and MPPU.
- Standard Anodized Aluminum Housing with Lexan® bezel viewing window, neoprene gaskets and stainless steel hardware.

## Measurement Variation Criteria\*

- Linearity:  $\pm 0.024"$  [ $\pm 0.61\text{mm}$ ] at 2-sigma.
- Repeatability:  $\pm 0.005"$  [ $\pm 0.127\text{mm}$ ].
- Stability: Better than  $\pm 0.005"$  [ $\pm 0.127\text{mm}$ ].
- Reproducibility:  $\pm 0.010"$  [ $\pm 0.254\text{mm}$ ].
- Accuracy:  $\pm 0.005"$  [ $0.127\text{mm}$ ].



\* Specifications based on Model 10XAS-10E-B sensor at 20" [508mm] emitter-to-receiver separation and 2" [51mm] stable product passline with material thickness of 0.0625" [1.59mm] and all environment conditions optimal for sensor operation with Model MPPU processing unit. Actual results may vary depending upon conditions.

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### Description

The 10XAS-Series systems consists of an emitter, receiver and cabling to connect the receiver with the emitter and the emitter to the processing unit (emitter-to-receiver cable is 15' [4.57m] and the emitter-to-processing unit is 20' [6.1m]; with a maximum of 50' [15.4m] for both cables). The receiver contains a low-noise preamplifier, a silicon photocell and a cylindrical lens. Light Emitting Diode (LED) arrays are used in SCAN-A-LINE™ emitters as the light sources. A single SCAN-A-LINE™ 10XAS-Series sensor can be used for edge guiding, center guiding or for width measurement. The 10XAS sensors can also be used in pairs for centerguiding and/or width measurement. A single sensor is also capable of measuring the width of one to four strips. SCAN-A-LINE™ 10XAS-Series sensors work well in many dirty environments by automatically adjusting for dirt and dust on the emitter lens. Reliable edge position detection can still be made with a 90% attenuation of sensor optical signals, providing the attenuation is uniform over the lens area. Fault circuitry provides an alarm if the sensor becomes too dirty and the incorrect number of edges is sensed.

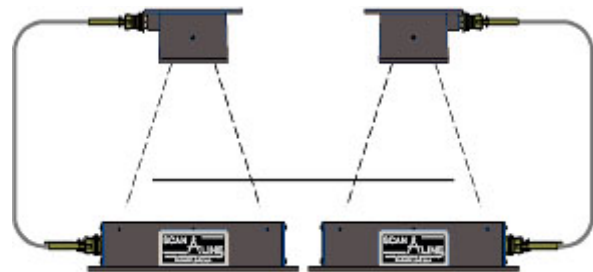
Each 10XAS-Series emitter and receiver pair operate as a complete position sensing sub-system. When supplied with  $\pm 12\text{VDC}$  power, the emitter will provide a SYNC pulse, marking the beginning of a scan cycle. Because the scan speed is constant, the position of lighted LED in time, with respect to the SYNC pulse, can be directly translated into position information. Digital processing circuitry is used to count clock pulses of a predictable frequency and translate the position information into measurement units. A simple counter can also be used to determine if the proper number of edges has been sensed and a fault relay is energized if there are too few or too many edges.

Because the light from each of the LEDs is emitted in the form of an expanding cone rather than a beam, it is possible to detect the attenuation of a particular diode by an object long before it completely blocks the light. By using sample-and-average techniques, the position of the object with respect to the array can be determined to a resolution many times better than the spacing between the LED diodes. The resolution of the system is related to and limited by the diode-to-diode uniformity and the signal-to-noise ratios of the photocell amplifiers.

| Sensor Size                      | Minimum Separation | Optimal Separation | Maximum Separation |
|----------------------------------|--------------------|--------------------|--------------------|
| 10XAS-10E                        | 15"<br>[381mm]     | 20"<br>[508mm]     | 72"<br>[1829mm]    |
| 10XAS-20E                        | 30"<br>[762mm]     | 40"<br>[1016mm]    | 72"<br>[1829mm]    |
| 10XAS-30E                        | 45"<br>[1143mm]    | 60"<br>[1524mm]    | 72"<br>[1829mm]    |
| 10XAS-40E                        | 60"<br>[1524mm]    | 72"<br>[1829mm]    | 72"<br>[1829mm]    |
| 10XAS-50E-B<br>(std. encl. only) | 60"<br>[1524mm]    | 72"<br>[1829mm]    | 72"<br>[1829mm]    |
| 10XAS-60E-B<br>(std. encl. only) | 72"<br>[1829mm]    | 72"<br>[1829mm]    | 72"<br>[1829mm]    |



Model 10XAS-10E-UT Emitter—Ultra-Tough Enclosure



Model 10XAS-10E-B Dual-Sensor System



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