10XBR-Series Sensors

Passline Independent Sensor Systems

Overview

- **Passline-Independent Width Measurement**
- **Passline-Independent Position Control (Guiding)**

The **SCAN-A-LINE™ 10XBR-Series Binocular-Receiver Sensor** from Harris Instrument Corporation provides highly reliable and accurate edge position detection and width measurement for process lines with varying product passlines (wavy edges) or large thickness changes. An extension of the 10XAS-Series, the **10XBR-Series** are non-contact, electro-optical sensors designed primarily for the edge position and width measurement applications. The 10XBR-Series uses two receivers to triangulate the position of the edge at varying passline heights.

The **10XBR-Series** sensor is compatible with the SCAN-A-LINE™ **PIC Based Measurement Processing Unit - Model MPX** and **Digital Control Processing Unit – Model DCPU** with up to two sensors per processing unit. Because of its versatility and reliability, the **10XBR-Series** sensor is one of the most flexible edge position detection and width measurement systems on the market today.

Available with:

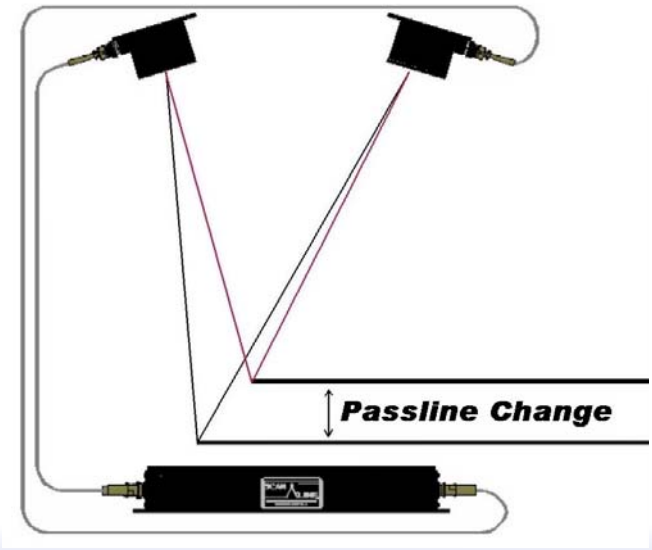
Standard Enclosure	Provides a highly efficient edge detection system in a dust proof housing designed for relatively dry environments.
ULTRA-TOUGH™ Option (UT Option)	Provides excellent crash protection with thick cast aluminum housings and borosilicate viewing windows with sealed connectors and gaskets (Model 10XBR-UT).
Infrared LED's	Permits the 10XBR-Series sensor to operate with visible light sensitive materials. Also provides for operation in very hazy or smoky conditions.

Features

- **Available in four sizes: 10" [254mm], 20" [508mm], 30" [762mm], 40" [1016mm] in Single or Dual Sensor operation**
- **Requires a PIC Based Measurement Processing Unit - Model MPX or Digital Control Processing Unit – Model DCPU**
- **Anodized Aluminum Housing with Lexan® bezel viewing window, neoprene gaskets and self-sealing, stainless steel hardware.**
- **Passline variation of up to 1' [305mm] standard for Passline-Independent Dimensional Measurement or Position Control**

*Measurement Variation Criteria**

- **Linearity: 0.024" [0.609mm] at 2-sigma with stable passline. (0. 032" [0.812mm] with variable passline)**
- **Repeatability: ±0.005" [±0.127mm]**
- **Stability: Better than ±0.005" [±0.127mm]**
- **Reproducibility: ±0.010" [±0.254mm]**



**Specifications based on a Model 10XBR-10 sensor at 20" [508mm] emitter-to-receiver separation and a 2" [51mm] to 14" [356mm] variable passline.*

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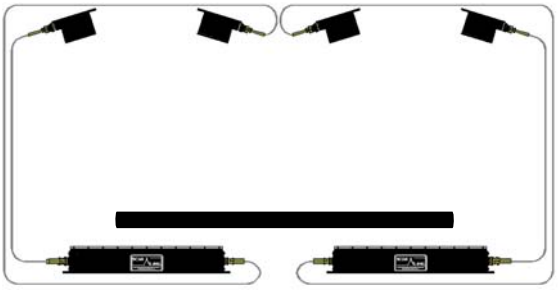
Description

The **10XBR-Series** sensor consists of an emitter, two receivers and all applicable cabling to connect the receivers with the emitter and the with the processing unit (emitter-to-receiver cables are 15' [4.39m] each and the emitter-to-processing unit cable is 20' [6.1m] with a maximum of 50' [15.4m] for both cables). The receivers contain a low-noise preamplifier, a silicon photocell and a cylindrical lens each. AlGaAs Light Emitting Diode (LED) arrays are used in SCAN-A-LINE™ emitters as the light sources. In addition to the LED counters, decoders and drivers, the emitter driver board contains a tuned amplifier for the video signals from the receivers. The 10" [254mm] long Model 10XBR-10 emitter uses a set of ten array sections. Each section is 1" [25.4mm] in length and is composed of ten LEDs spaced 0.1"[2.54mm] apart.

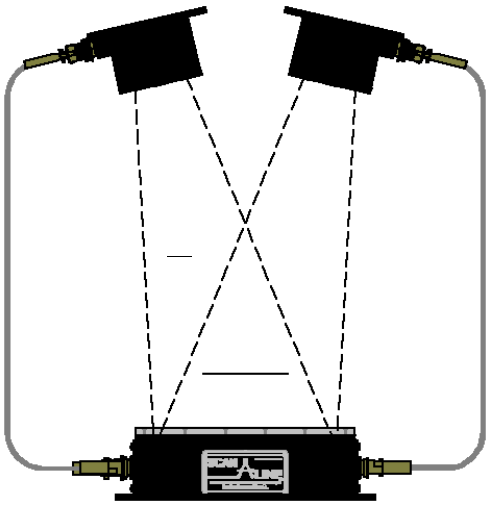
The SCAN-A-LINE™ **10XBR-Series** sensor can be used individually (single-sensor systems) as centerline position sensors and dimensional measuring sensors. They can also be used in pairs to measure material dimensional size, as well as provide centerline position. Materials larger than the combined lengths of the modules can be accommodated by adding the separation between the emitters to the portion of each emitter covered. Reliable edge position detection's can still be made with a 90% attenuation of optical signals, providing the attenuation is uniform over the lens area.

Each **10XBR-Series** emitter and binocular receivers operate as a complete position sensing sub-system. When supplied with ±12VDC 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 in the emitter counts the clock pulses of a predictable frequency and translates the binocular views into a sensor video signal. A simple counter is also being used to determine if the proper number of edges have been sensed. In a single edge application (typically a dual-sensor system, as each sensor only detects one edge), the lack of an edge transition or the presence of more than one edge indicates a FAULT event.

The patented binocular view of the strip material by the **10XBR-Series** sensor creates a geometric relationship of the position of the strip material edges, which used by **PIC Based Measurement Processing Unit - Model MPX or Digital Control Processing Unit – Model DCPU** to calculate the height of the strip material. The height of the strip is then processed with the edge position signals to provide, in English or Metric, the width of the material independent of material product passline or material thickness.



Model 10XBR-20 Dual-Sensor System



Model 10XBR-10E-B Emitter

Sensor Size	Minimum Separation	Recommended Separation	Maximum Separation
10XBR-10	15" [381mm]	20" [508mm]	72" [1829mm]
1OXBR-20	30"	40" [1016mm]	72" [1829mm]
10XBR-30	45" [1143mm]	60" [1524mm]	72" [1829mm]
10XBR-40	60" [1524mm]	72" [1829mm]	72" [1829mm]

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