

# 10XHD-Series Sensors

## for hole detection & loop control

### Overview

The SCAN-A-LINE™ Hole Detection 10XHD-Series sensor from Harris Instrument Corporation provides highly reliable and accurate hole detection and loop position control.

The 10XHD-Series is a non-contact, electro-optical sensor designed specifically for the detection of weld marker holes in strip materials, though it is capable of many various hole detection applications. Because of its versatility and reliability, the 10XHD-Series sensor is one of the most reliable and cost effective hole detection sensors on the market today.

Another application for the 10XHD-Series sensor is the accumulator loop control system, where the 10XHD-Series sensor detects strip position in an accumulator (or looping) pit.

10XAHD-Series sensors are compatible with the SCAN-A-LINE™ HDPU Hole Detection Processing Unit and the LCPU Loop Control Processing Unit. Because of its versatility and reliability, the 10XHD-Series sensor is one of the most flexible & cost effective hole detection and loop position sensor systems on the market today.



Optional Ultra-Tough enclosure

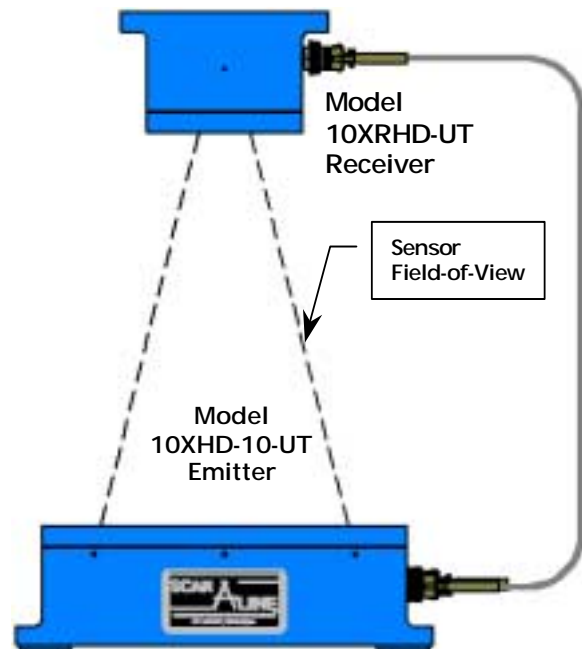
### Options

**ULTRA-TOUGH™ Option (UT Option)** Provides excellent crash protection with thick cast aluminum housings and borosilicate viewing windows along with sealed connectors and gaskets (Model 10XHD-UT).

**Long-Range Receiver (LRR Option)** The sensor is fitted with special lenses for operational emitter-to-receiver separation up to 40' [12.2m]. Only used with the Loop Control Processing Unit – Model LCPU for the control of accumulator loop control pits.

### Features

- Available in four sizes: 10 inch [254mm], 20 inch [508mm], 30 inch [762mm] and 40 inch [1016mm].
- Compatible with HDPU Hole Detection Processing Unit and the LCPU Loop Control Processing Unit
- Standard Type 'B' anodized aluminum housing with Lexan® window, neoprene gaskets and stainless steel hardware.
- Available in type 'UT' Ultra-Tough enclosure for rugged industrial environments.
- LED light source is virtually maintenance free.
- Hole detector operates in several modes including: any hole, edge and hole & edge and two holes
- System fault and fail safe contacts
- System is highly tolerate of dirt, smoke, steam, etc.
- Multiple Mode Hole Detection: any hole, edge & 1 hole, edge & 2 holes



Single Sensor Hole Detection Sensor System

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### Description

The 10XHD-Series sensor system consists of an emitter, receiver and all applicable cabling to connect the receiver with the emitter and the emitter with the processing unit. The receiver-to-emitter cable is two pieces with in-line connector a total of fifteen feet [4.39m] for weld hole applications and thirty-five feet for loop control applications. The standard emitter-to-processing unit cable is twenty feet long [6.1m] with a maximum of fifty feet [15.4m].

The SCAN-A-LINE™ 10XHD-Series emitters contain a scanned array of high-intensity Infrared (IR) Light Emitting Diodes (LEDs), 100 per ten inch [254mm] length. Each 10 LED module lights sequentially with a scan rate of 0.5ms per ten inches [254mm].

The receiver contains a low-noise preamplifier, IR filtered light detectors and a cylindrical lens. The receiver light detectors are silicon photocells. All of the light focused by the receiver lens onto the photocell generates an electrical current. The light coming from the 10XHD-Series emitter is visible-light filtered and pulses at 20KHz, so the current generated in the 10XHD-Series receiver also pulses at 20KHz. This assists in preventing ambient light from interfering with the 10XHD-Series receiver.

When the 10XHD-Series receiver is positioned to "see" all of the diodes in the emitter, the absence of light at the instant in time when a diode is being lit indicates that an object is blocking the light path at that diode. When light is detected, the photocell produces an electrical current proportional to the infrared energy falling on its surface. The resulting current is delivered to the input of a balanced low noise pre-amplifier that is tuned to pass only the 20kHz signals generated by the emitter LED arrays.

Because the 10XHD-Series is producing and looking for light modulated at approximately 20kHz, it is unlikely that typical low level ambient light sources will be a problem. It is best to avoid placing a direct high-intensity light or reflected, modulated light source in the receiver view path. A bright light source (such as strobe lights or reciprocating warning lights) can overload the receiver photocell and prevent it from detecting the emitter light. Proper hole detection requires a product passline of two inches [51mm] to four inches [102mm]. Reliable hole detection's can still be made with a 90% attenuation of optical signals, providing the attenuation is uniform over the lens area.

#### Hole Detection Systems:

The size and number of sensors required ( 10", 20", 30" or 40") for a particular application is determined by several factors including: hole size, line speed, position of the hole in the strip and whether the hole position varies. Some systems may require multiple sensors. Contact Harris Instrument or your local representative for assistance with sensor system selection.

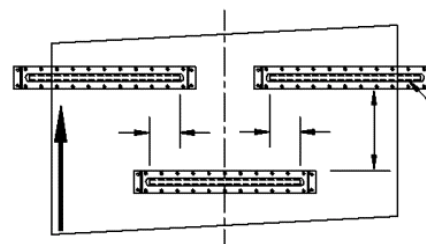
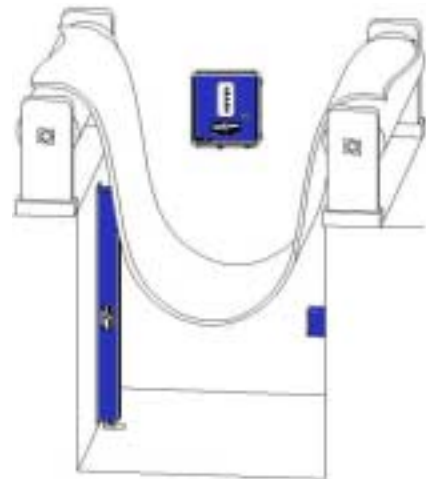
### Hole Detector Data

Emitter Length	Scan time	Minimum receiver ht.	Approx. Max. Line Speed for 1" hole
10"	0.5 ms	15"	8000 fpm
20"	1.0 ms	20"	4000 fpm
30"	1.5 ms	45"	2500 fpm
40"	2.0 ms	60"	2000 fpm



Standard type 'B' enclosure

Loop  
Control  
System



Multiple sensors for wide strip & variable hole locations



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