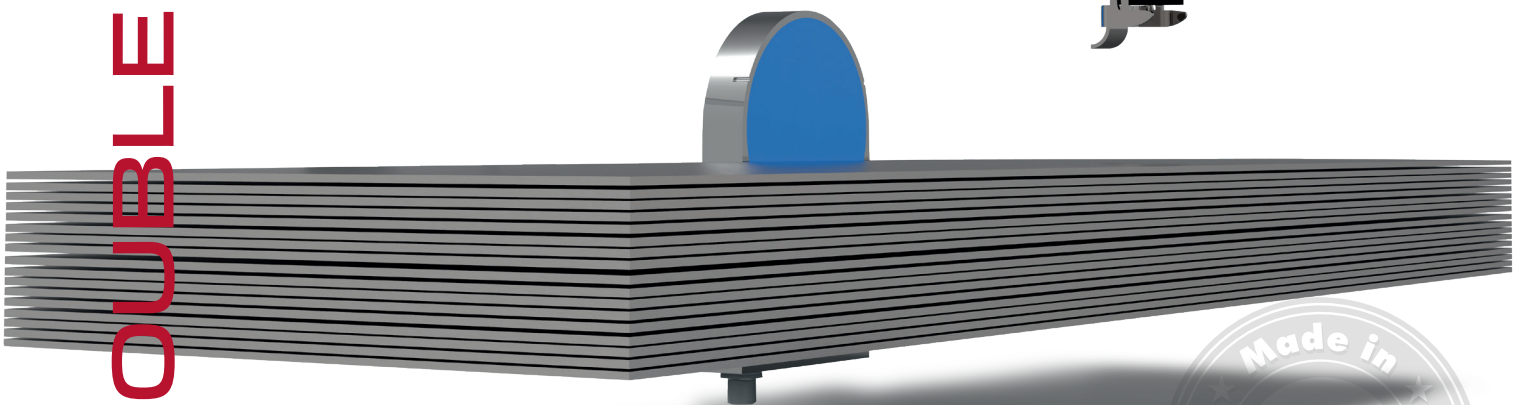




## EAGLE EYE AA

### DOUBLE SHEET AND JOINT DETECTION

- Universal inductive sensor principle for the detection of layers, butt joints and edges in metallic semi-finished products
- Contact free and independent from optical properties, for all metals
- Applicable for start and stop operation
- Analog output 4...20 mA or 2...10 V, for connection to the PLC
- Available in different sizes and designed for different fields of applications



# EAGLE EYE AA

With the eddy current sensor AA-type, Roland Electronic has succeeded to develop an amazing sensor. The sensor, consisting of several coupled bobbins, reminds in the figurative sense the vision of the giant Argus (Eagle) in Greek mythology. If something comes into the inductive „field of view“, then it will not lose the sight of it.

When processing sheets, strips and other semi-finished metallic products, such as stacked sheets or individual segments of coil packages, a secure and reliable detection of sheets, of coil segments or butt joints becomes necessary.

## Application

The Eagle Eye AA is capable to detect especially structural material boundaries in metals. These might be for example air gaps between butt joints or stacked sheets. Even metallic transitions with different types of metals are detected reliably.

In the detection of ferromagnetic materials the sensor indicates a very significant signal which is affected only by the number of material boundaries. Applications solvable only with complex systems become so far possible with this sensor type.

The analog sensor signal output can be processed rapidly with a performant PLC. The universal control unit XA100-S may be used for a simple and quick integration in an existing system. The control unit provides switching signals for norm-, under- and over size limits.

## Function

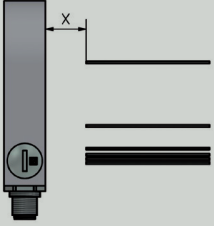
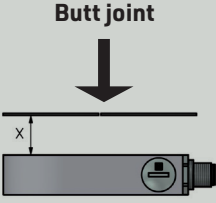
To proceed a correct measurement, it is a basic condition to adjust the sensor perpendicular to the material transition. When destacking sheets from a cart, the sensor is targeted to the lateral side of the cart (Fig.1). When detecting butt joints, the sensor must be positioned parallel to the material (Fig.2).

The edge of the blank has to pass the sensor in a constant distance  $X$ . When a material transition passes along the sensor, the signal value rises or falls above or under standard value. This signal can be monitored with a windows comparator, both in start and in stop operation.

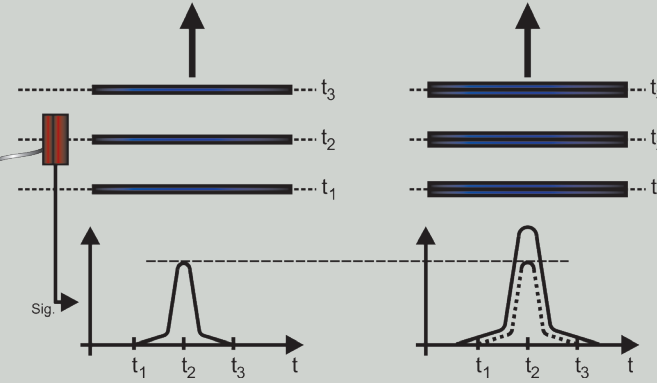
Keep in mind that the distance between the sensor and the material must remain constant. In applications that do not apply to this basic condition, Roland Electronic offers other solutions in its product program. The maximum transport velocity of the material depends on the sample rate of the system in usage. According to the application it is required that the PLC is able to sample and to process the sensor signal with 1 KHz.

If that is not possible the control unit XA100 can be used to process switching signals directly.

### Constant distance $X$ between sensor und material to detect correctly layers, butt joints and edges

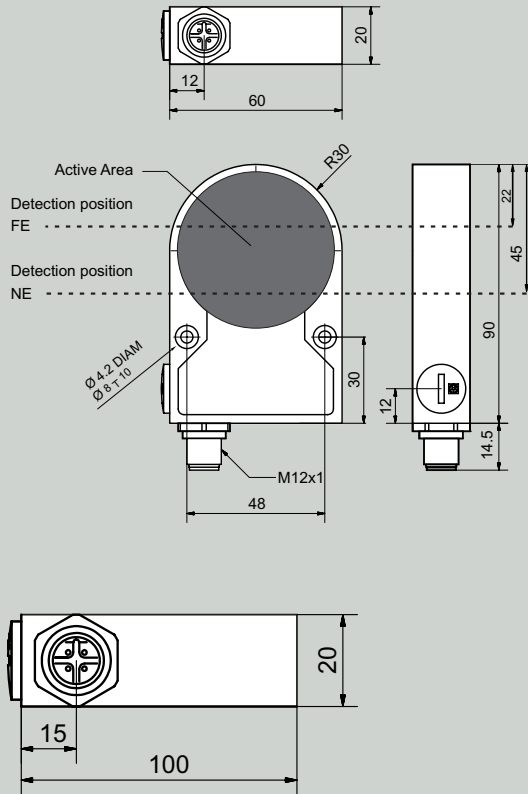
	<p>Fig.1 Adjustment of the sensor when destacking sheets from the blank cart</p>		<p>Fig.2 Parallel adjustment of the sensor in detection of butt joints</p>
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### Sensor signal in dependance on time (or position) and number of sheet layers

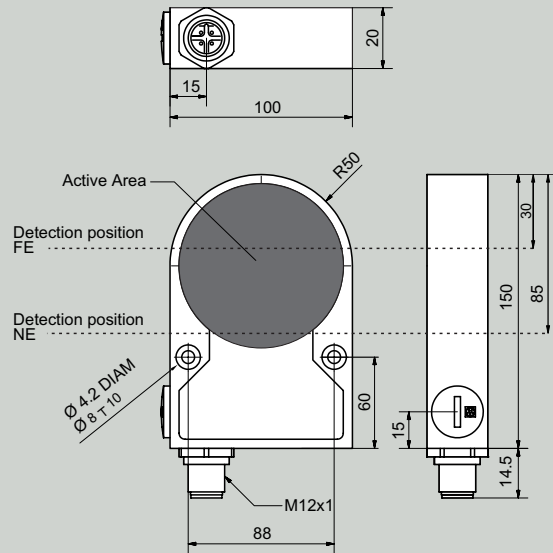
	<ul style="list-style-type: none"> <li>• <b>Static Measurement:</b> In this case the sheet is moved at a constant distance <math>X</math> always into the same position <math>t</math> in front of the sensor. In this position the sensor signals are analyzed. After this evaluation the sheet can be removed.</li> <li>• <b>Dynamic measurement:</b> For instance when destacking. In this case the the sheet passes the sensor at a constant distance <math>X</math>. The analysis and evaluation of the sensor signals have to be made during the movement.</li> <li>• The highest signal amplitude is reached in the detection position <math>t_2</math>. The positions for FE metals and NE metals are not identical. Their positions are marked in the technical drawings of the sensors.</li> </ul>
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# DOUBLE SHEET AND JOINT DETECTION

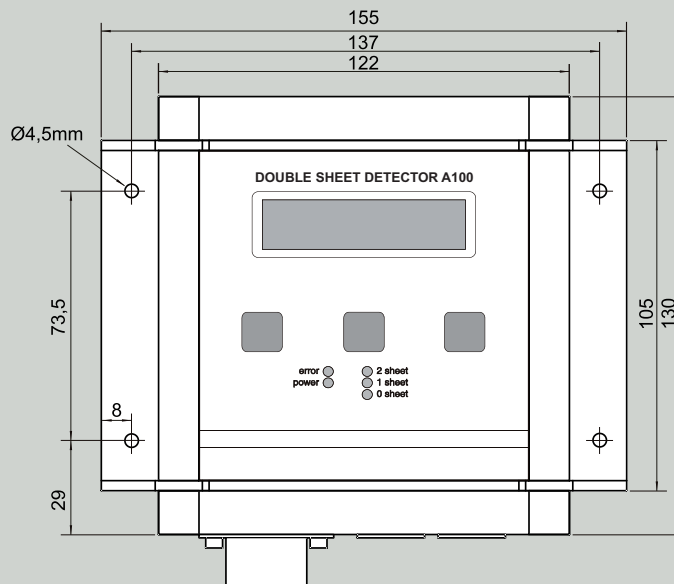
## Sensor AA90x60-xxx-S



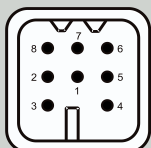
## Sensor AA150x100-902F8S



## Control unit XA100-S



## XA100-S Supply connection



### Enclosure HAN 3A, EMI-type metrical 7-pin insert on PE

Pin 1	+24V DC	Pin 5	1-Sheet
Pin 2	GND	Pin 6	0-Sheet
Pin 3	Teach-In	Pin 7	+24V DC f. I/O
Pin 4	2-Sheet	Pin 8	PE



# Technical Data

	AA90x60-453F2S	AA90x60-902F8S	AA150x100-902F8S
Ferrous material, single sheet thickness:	0.2 ... 4 mm	0.4 ... 8 mm	0.4 ... 8 mm
Distance X (Distance variation < +/- 0.5 mm):	0.5 mm	7 mm	9 mm
Stainless steel, aluminum, copper:	After application test		
Time period for the analog signal, full scale:	< 20 ms		
Supply voltage:	20 ... 28 VDC		
Supply current:	< 50 mA		
Output voltage:	0/2 ... 10 V		
Output voltage load:	100 K $\Omega$ (min. 10 K $\Omega$ )		
Output current:	0/4 ... 20 mA		
Output current load:	50 $\Omega$ (min. 0 $\Omega$ / max. 300 $\Omega$ )		
Temperature range:	+ 15°C ... +45°C (Operation) - 20°C ... + 70°C (Storage)		
Sensor weight:	250 g	250 g	500 g
Conformity:	CE		

# Order Information

Control Unit	
Part no.	Description
XA100-S	Control unit in Aluminum enclosure, supply voltage 20 ... 28 VDC

Sensors	
Part no.	Description
AA90x60-453F2S	Eagle Eye sensor with plug-in connection
AA90x60-902F8S	Eagle Eye sensor with plug-in connection
AA90x60-902F8S	Eagle Eye sensor with plug-in connection

Cables*	
Part no.	Description
SCWFM12S-GG	Sensor cable for connecting the sensor to the control unit XA100-S
CWFM12S-GG	Sensor cable for connecting the sensor to the PLC
<b>* Standard length of cable is 5 m, other lengths on request</b>	

Accessories	
Part no.	Description
S0003515	Harting connector, complete

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