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# *esp-4/Empf/3BEE/M18*

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# esp-4

Label and splice sensor compact in a single unit, optionally with M12 sensor heads.

## Highlights

- 3 Teach-in methods › to be able to configure the sensor individually for any task
- Response time < 300 µs › for use at high web and label speeds
- QuickTeach › simplified Teach-in process
- Splice detection even for thick band materials
- Variants with very compact transmitters and receivers in the M12 threaded sleeve

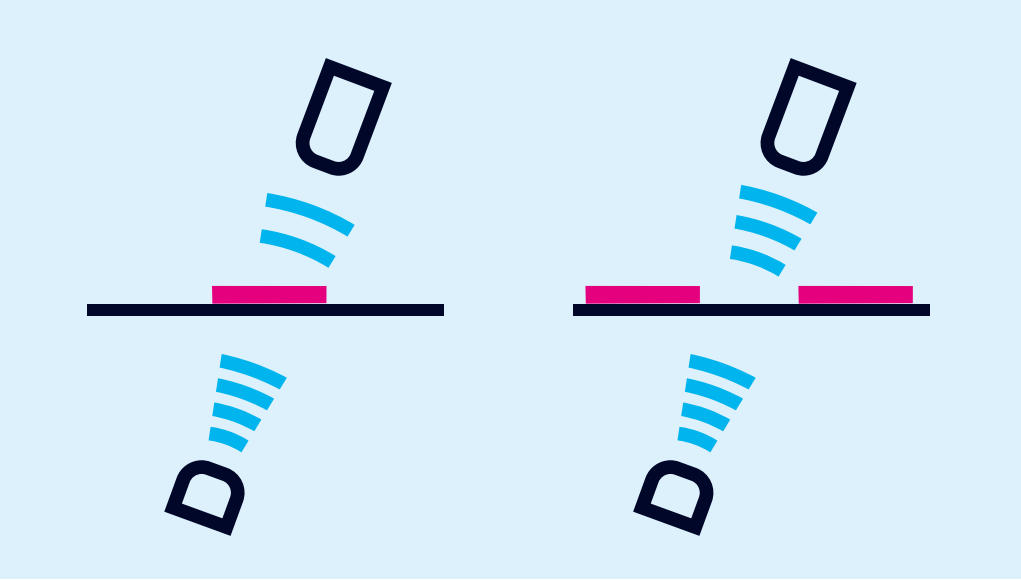
## Basics

- Label and splice sensor in a single unit
- 2 switching outputs › for label/splice detection and web break monitoring
- LinkControl › as optional assistance for installation and commissioning

# Label and splice sensor in one appliance

With a rapid pulse sequence, an ultrasonic transmitter beams upwards against the backing material. The effect of the sound pulses inducing the backing material to vibrate is for a markedly weakened sonic wave to be emitted on the opposite side.

The receiver receives this sonic wave and analyses it. The backing material signal level is different to that of the label or splice. And this difference in signal is analysed by the esp-4. The difference between backing material and a label or between sheeting and splice can be very slight indeed. In order to differentiate, the esp-4 sensor has to learn the signal level for the backing material or sheeting.



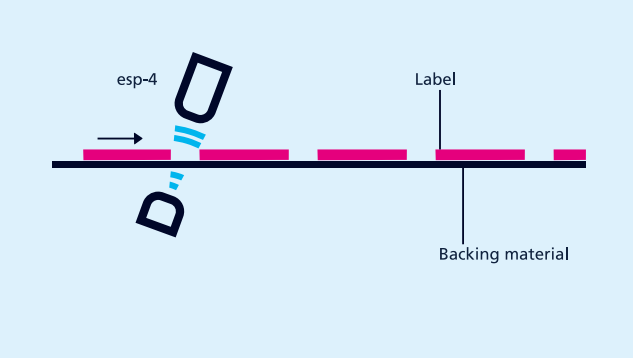
*Backing material with label provides an attenuated signal level*

The esp-4 sensors can be used as a label and splice sensor. The 3 Teach-in methods and QuickTeach allow the esp-4 sensor to be optimally set for each and every assignment.

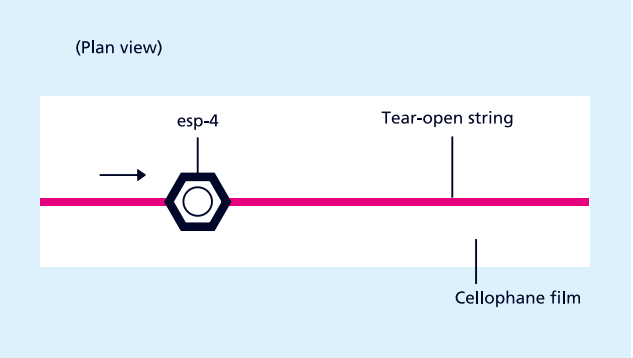
## A) Dynamic Teach-in of backing material and label

During Teach-in, the backing material with the labels is led at a constant speed through the esp-4 sensor. The esp-4 sensor automatically learns signal levels for the labels and for the gaps between them.

This Teach-in method is also suitable for Teach-in of a tear-open string on a cellophane film. Here, during Teach-in, the tear-open string on the cellophane film is moved a number of times through the sensor. This enables the esp-4 to gauge the changing between cellophane film and tear-open string.




*esp-4 as a label sensor*



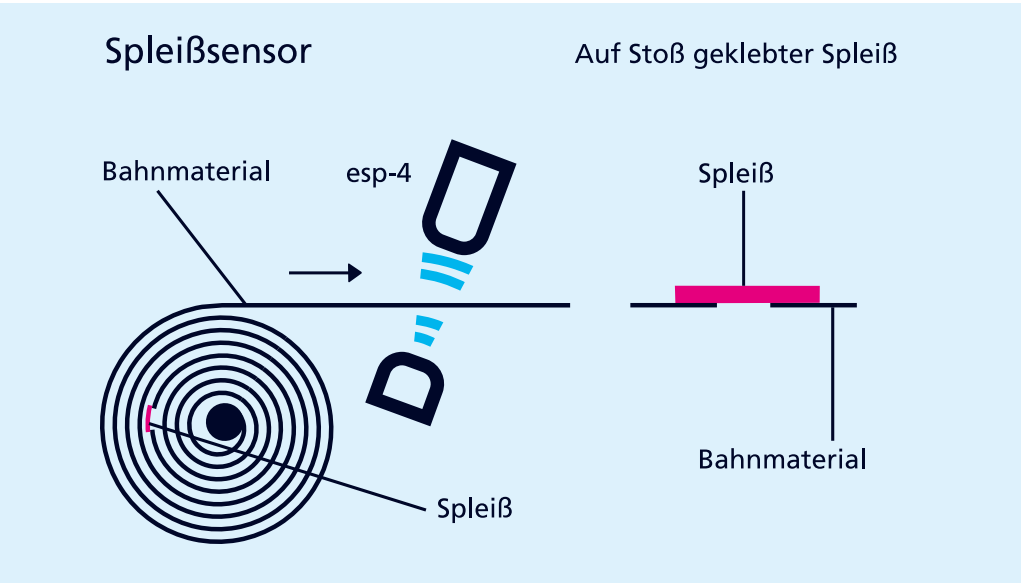

*esp-4 as a thread sensor*

### *B) Separate Teach-in for backing material and labels*

The signal level difference for the backing material and labels might be very slight. In order to still scan labels with very little difference in signals, Teach-in for the signal levels is done separately: Teach-in is first done for the backing material and then for the label on it. The switching threshold then lies between these two signal levels.

### *C) Teach-in only for sheeting*

Sheeting is usually processed from the roll. Then the splice to be detected for setting the esp-4 is somewhere inaccessible in this roll. A separate Teach-in method is available here in which the Teach-in only applies to the sheeting. The esp-4 detects the splice from this difference in sound level and sets its output.




*esp-4 as a splice sensor*

### *QuickTeach*

The esp-4 learns the material as long as signal level is applied to C1.

### *With LinkControl*

the esp-4 can optionally be parameterised. Measured values can also be shown grafically.

### *Two housing designs with different ultrasonic frequencies*

The esp-4/3CDD/M18 E+S and esp-4/3BEE/M18 as a receiving transducer integrated directly into the evaluation electronics is typically used for the detection of splices in thick sheetings.

The esp-4/M12/3CDD/M18 E+S has an external receiving transducer. The transmitter and receiver are each housed in M12 threaded sleeves. The variant with M12 sensor heads is preferred for the detection of labels.

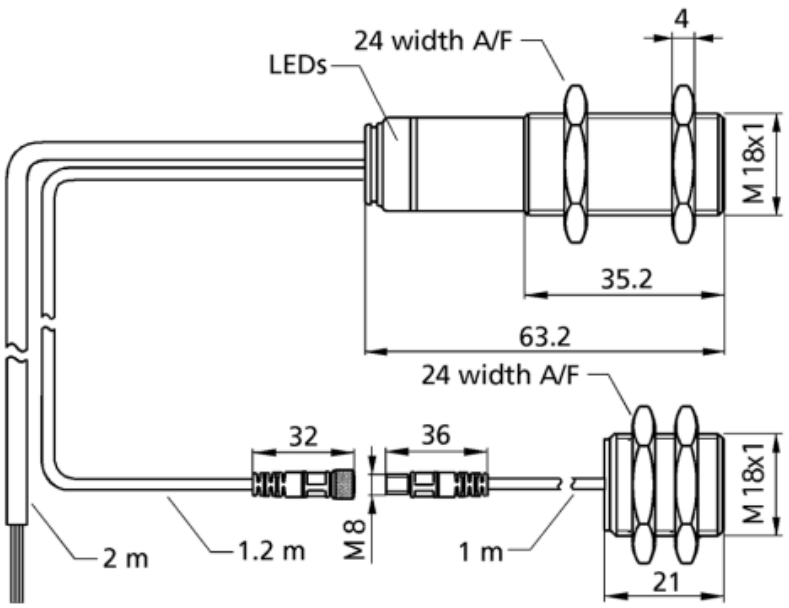

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# esp-4/Empf/3BEE/M18

## scale drawing




2 x npn

| | |
|---|---|
| design | cylindrical M18 |
| operating mode | label/splice detection |
| working range | sheeting with weights of < 20 g/m$^2$ up to >> 600 g/m$^2$, metal-laminated sheets |

## Ultrasonic-Specific

| | |
|---|---|
| means of measurement | pulse operation with amplitude evaluation |
| transducer frequency | 400 kHz |
| blind zone | 7 mm in front of transmitter and receiver |

## Electrical Data

| | |
|---|---|
| voltage ripple | ± 10 % |
| no-load current consumption | ≤ 50 mA |
| type of connection | 2 m PUR cable, 7 × 0.14 mm$^2$ |

## Outputs

| | |
|---|---|
| output 1 | switching output<br>label/splice detected<br>npn: $I_{max}$ = 200 mA (-$U_B$+2V)<br>NOC/NCC adjustable, short-circuit-proof |
| Ausgang 2 | switching output<br>web break<br>npn: $I_{max}$ = 200 mA (-$U_B$+2V)<br>NOC/NCC adjustable, short-circuit-proof |
| response delay | < 300 µs |

## Inputs

| | |
|---|---|
| input 1 | control input |
| Eingang 2 | control input |
| Eingang 3 | control input |

## Housing

| | |
|---|---|
| material | brass sleeve, nickel-plated, plastic parts, PBT, PA |
| ultrasonic transducer | polyurethane foam, epoxy resin with glass contents |
| class of protection to EN 60529 | IP 65 |
| operating temperature | +5°C to +60°C |
| storage temperature | -40°C to +85°C |
| weight | 100 g |

## Technical Features/Characteristics

| | |
|---|---|
| controls | control input |
| scope for settings | Teach-in via control inputs<br>LCA-2 with LinkControl |
| indicators | 1 x Duo-LED; green: working / red: label/splice detected / flashing red: web break |

## pin assignment

