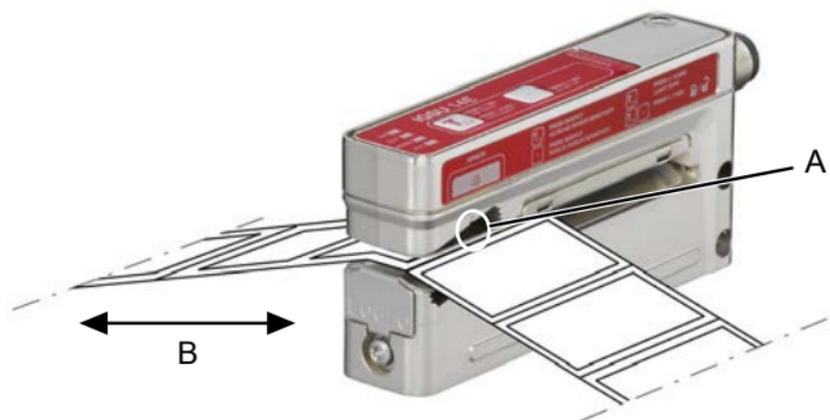
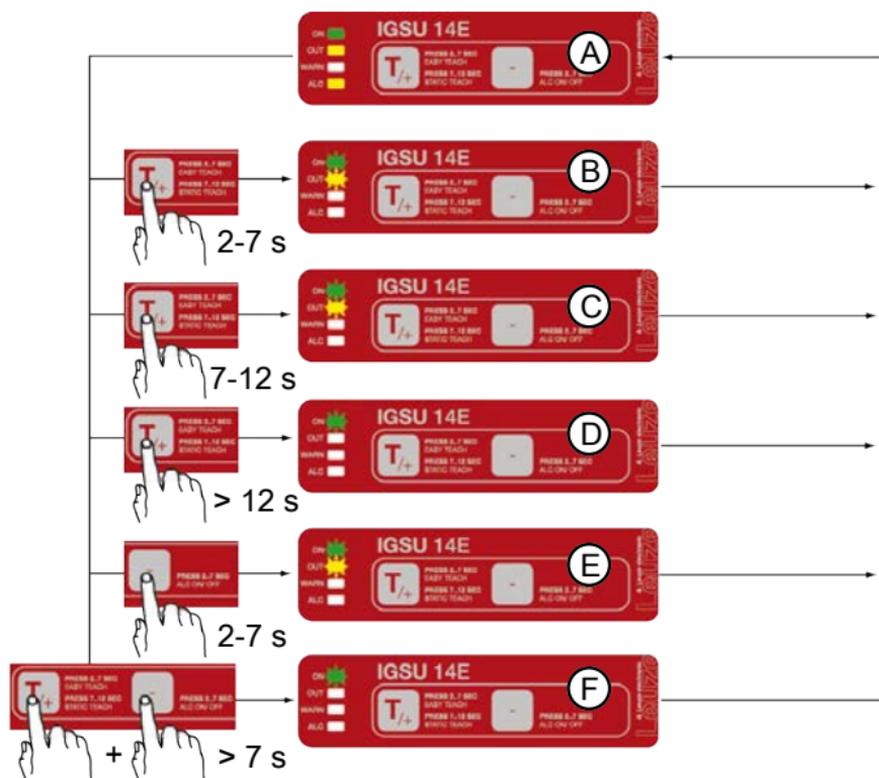


1



2



3



4



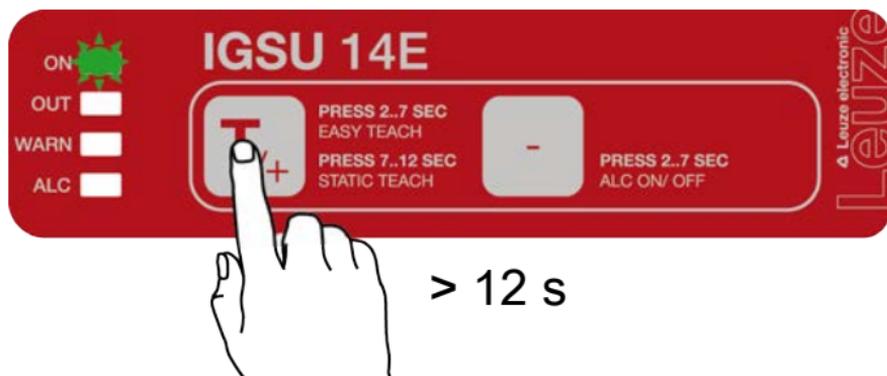
2-7 s

5

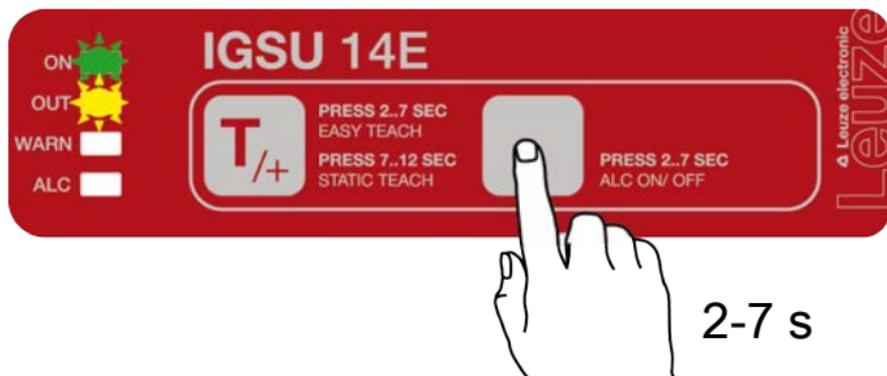


7-12 s

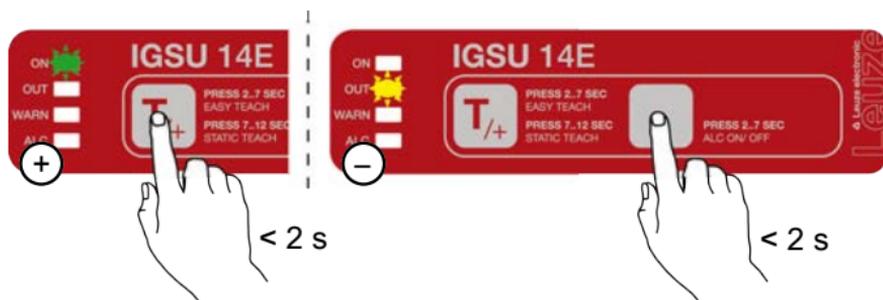
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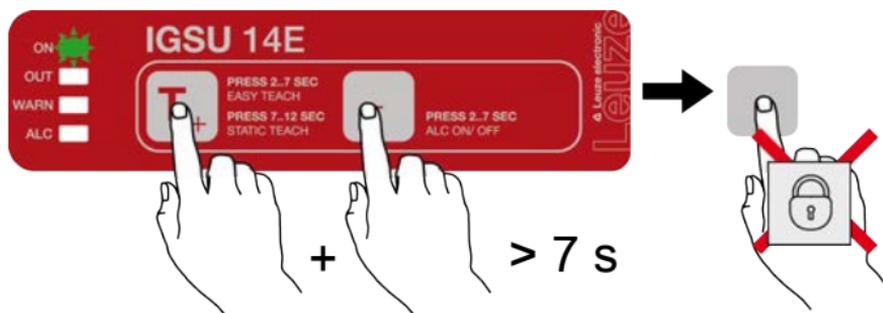
7



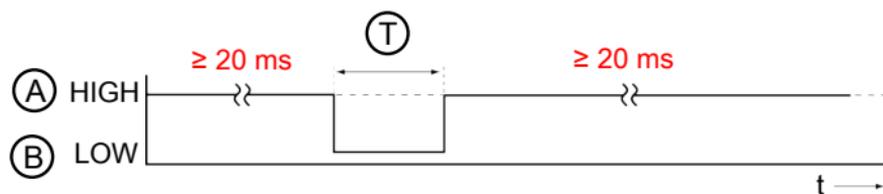
8

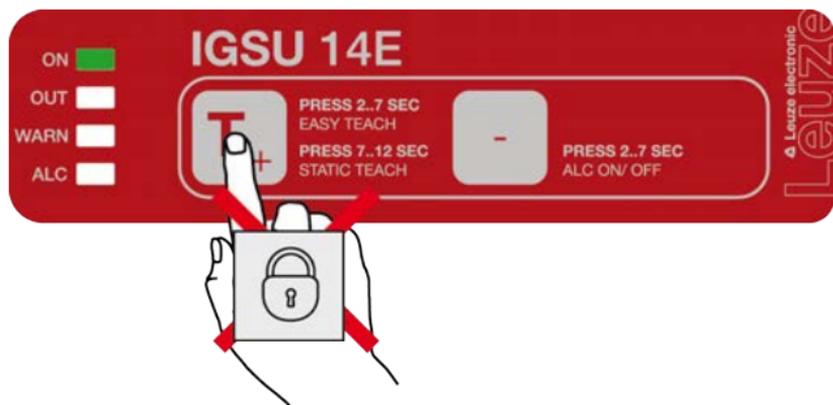


9



10





Intended use

The ultrasonic label forks are ultrasonic sensors for contactless detection of the gap between two consecutive labels on a carrier tape.

NOTICE**Observe intended use!**

This product is not a safety sensor and is not intended as personnel protection.

- ↳ Only allow competent persons to put the product into operation.
- ↳ Only use the product in accordance with its intended use.

Function and device operation

The label material used determines the achievable precision and the reliability of gap detection between labels.

- Light switching: signal in the label gap.
- Dark switching: signal on the label.

1

A	Label center position
B	Label run

- ↳ To achieve a high switching accuracy, place the label tape on the lower fork with slight tension.
- ↳ Align the label tape with the "Label center position" marking.

Overview of the operating structure via the teach and minus buttons**2**

A	Standard function Normal operation after switch-on
B	easy Teach (while the label tape is passing through) (2-point calibration on carrier and label)
C	Static teach (on the label carrier without transport) (1-point calibration on carrier)
D	Set switching behavior (light/dark switching)
E	Deactivate/activate the <i>ALC</i> (Auto Level Control) function (automatic optimization of the switching threshold)
F	Manual locking/unlocking of the buttons on the device

IGSU 14E standard functions

During operation the sensor is always in this function.

The sensor detects label gaps with high precision and speed.

This is indicated by the yellow OUT LED and the switching output.

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ON LED green	Constantly ON when operating voltage is applied.
OUT LED yellow	Indicates the switching signal. LED is ON if the sensor detects label gaps. The display is independent of the output setting.
WARN LED continuous red light	OFF: error-free operation. ON: teaching error caused by unfavorable label material ON: <i>ALC</i> (Auto Level Control) function is faulty.
ALC LED yellow	<i>ALC</i> (Auto Level Control) function is active.

easy Teach while the label tape is passing through (dynamic)

During the *easy Teach* process, a two-point calibration is performed on the carrier and the label.

NOTICE



With respect to detection reliability, the *easy Teach* process is generally to be preferred over the static teach process.

Preparation: Insert label tape into the sensor.

4

- ↪ Press the teach button until the green ON LED and the yellow OUT LED flash synchronously.
- ↪ Release the teach button.
- ↪ Allow the label tape to advance through the sensor at a maximum speed of 50 m/min.
 - ⇒ The sensor indicates the belt transport by a more rapid synchronous flashing of the green ON LED and yellow OUT LED.
- If sufficient teach values are determined, the sensor automatically terminates the teach event and goes into standard mode. The transport of the label tape can be stopped immediately.
- The number of labels to be transported is always based on the material combination. From experience, approximately 2-10 labels should be advanced through the sensor.
- If the teach event is faulty (e.g., unfavorable material combination, uneven transport, jittering during transport), the red WARN LED illuminates and the warning output (if present for the sensor model) is activated. If the fault cannot be rectified, e.g., via the *easyTune* function, the label material cannot be detected with the device.

Static teach on the label carrier without transport

With the static teach process, a one-point calibration is performed on the blank carrier. This process is especially advantageous because no labels are lost while teaching.

Preparation: depending on the label size, pull off one or more labels from the carrier and insert the blank area into the sensor.

5

- ↪ Press the teach button until the green ON LED and the yellow OUT LED flash alternately.
- ↪ Release the teach button.

Adjusting the switching behavior of the switching output (light/dark switching)

6

- ↪ Press the teach button until only the green ON LED flashes.
- ↪ Release the teach button.
The green ON LED flashes for another 2 seconds and the yellow OUT LED indicates the changed switching behavior for 2 seconds:
 - Yellow OUT LED ON: switching output, light switching (signal in the label gap)
 - Yellow OUT LED OFF: switching output, dark switching (signal on the label)

ALC (Auto Level Control) function

With the *ALC* function, the sensor automatically corrects the switching threshold in such a way that the maximum function reserve is always available during operation.

NOTICE



The *ALC* function is active by default and is indicated by illumination of the yellow *ALC* LED.

In each teach event, the current signal values in the sensor are digitally determined. This results in the optimum switching threshold being calculated for maximum function reserve.

All values are saved and are non-volatile, retaining their validity as long as the dynamic parameters of the system remain unchanged and the material is not changed.

Signal changes can result each time the roll is changed, even with labels that are apparently the same.

- This is caused, for example, by material variations which affect the acoustic impedance of the ultrasonic system (material thickness, homogeneity, etc.).
- In addition, changes to the dynamic system parameters (tape tension, middle position of the labels, jitter, etc.) could have a negative effect on the function reserve of the sensor.

With the *ALC* function, the sensor automatically corrects the switching threshold in such a way that the maximum function reserve is always available during operation - the sensor works absolutely reliably and free of errors.

The teach event only needs to be repeated if the sensor does not switch following a change of material.

NOTICE



When changing to another type of label, a new adjustment must generally be carried out by teaching it.

Activate or deactivate *ALC* function

The *ALC* function can be manually deactivated and activated.

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- ↳ Press the minus button (-) until the green ON LED and the yellow OUT LED flash synchronously.
- ↳ Release the minus button (-).

NOTICE



The manual deactivation/activation of the *ALC* function is stored in non-volatile memory in the sensor.

easyTune – Manual fine tuning of the switching threshold

With homogeneous label material, the signal in the gap between two labels is much larger compared to the signal on the label.

For the taught switching threshold, there is a high function reserve in both the gap as well as on the label, and the sensor functions reliably.

To achieve a better function reserve, it can be advantageous to change the taught switching threshold, especially for inhomogeneous label material.

The sensitivity of the sensor and, thus, the switching threshold can be adjusted with the *easyTune* function, which is in principle comparable to a potentiometer.

NOTICE



Use of the *easyTune* function temporarily deactivates the *ALC* function!

The *ALC* function is reactivated after teaching again.

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The sensitivity of the sensor can be adjusted by pressing the teach button (+) or the minus button (-).

Increase sensitivity:

- ↳ Briefly press the teach button (+).
 - ⇒ A single flash of the green ON LED confirms button actuation.

Reduce sensitivity:

- ↳ Briefly press the minus button (-).
 - ⇒ A single flash of the yellow OUT LED confirms button actuation.

Recommended settings

Observation	Measure	Action
After teaching, the yellow LED and the switching output flicker if the label is moved through the sensor: The function reserve on the label is too low.	Reduce sensitivity of the sensor (upward shift of the switching threshold)	Repeatedly press the minus button (-) briefly until the sensor detects the moving label stably and without interruption.
In rare cases, a highly inhomogeneous carrier tape can affect the functional reliability. The yellow LED and the switching output flicker if the blank carrier tape is moved through the sensor without labels: The function reserve on the carrier is too low.	Increase sensitivity of the sensor (downward shift of the switching threshold)	Repeatedly press the teach button (+) briefly until the sensor detects the moving carrier tape without labels stably and without flickering.

Manual locking/unlocking of the buttons on the device

To protect against erroneous operation, the locking of the buttons is intended to prevent a button on the device from accidentally being pressed. Accidental button actuation could unintentionally trigger the *easyTune* function or the teaching of the device and thereby deactivate the *ALC* function.

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- ↪ Press the teach button (+) and the minus button (-) simultaneously until the green ON LED flashes at approx. six times per second.
- ↪ Release the teach button (+) and the minus button (-).
- ⇒ The buttons are now locked and can no longer be operated.
- ⇒ The buttons are unlocked using the same button combination.

NOTICE



Manual locking of the buttons on the device is stored in volatile memory.

Sensor adjustment via teach input (pin 5)

Teach-in

To teach, a teach signal is applied to the teach input (pin 5). The duration of the teach signal (low level on the teach input) determines the teach-in function.

NOTICE



Before a low level is applied for teaching-in functions, a high level must be applied for at least 20 ms.

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A	Buttons locked
B	Buttons can be operated
T	Duration of the teach signal

Duration T [ms]	Function
20 ... 80	<i>easy Teach</i> while the label tape is passing through
120 ... 180	Static teach
220 ... 280	Configure the switching behavior of the switching output: light switching
320 ... 380	Configure the switching behavior of the switching output: dark switching
420 ... 480	easyTune (-): reduce sensitivity
520 ... 580	easyTune (+): increase sensitivity
620 ... 680	Activate the <i>ALC</i> function
720 ... 780	Deactivate the <i>ALC</i> function

Locking the buttons via the teach input

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Manual locking of the buttons on the device is only suitable for protecting against tampering to a limited extent since locking can be canceled using the corresponding button combination. For this reason, it is also possible to lock the buttons via the teach input (pin 5).

- A **static high signal** (≥ 20 ms) on the teach input locks the buttons on the device so that no manual operation is possible. The buttons can then no longer be unlocked using the described button combination.
- If the teach input is not connected or if there is a static low signal, the buttons are unlocked and can be operated freely.

NOTICE



The buttons can also be locked/unlocked via IO-Link.