Leuze

Ultrasonic label fork

GSU 14E

We reserve the right to make changes – 2020/04/23 – 50143645

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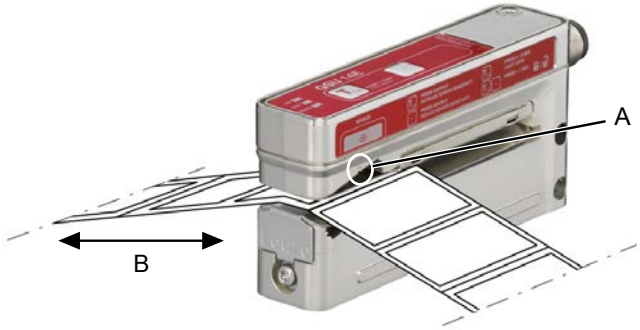
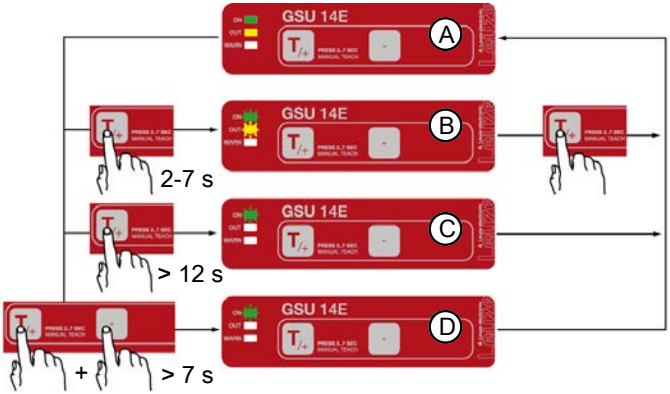
1



2



3


ON
OUT
WARN
GSU 14E
T/+
PRESS 2..7 SEC
MANUAL TEACH
-
Leuze electronic
Leuze

4


ON
OUT
WARN
GSU 14E
PRESS 2..7 SEC
MANUAL TEACH
-
Leuze electronic
Leuze
2-7 s

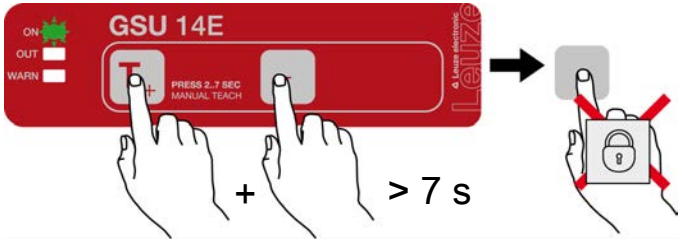
5


ON
OUT
WARN
GSU 14E
PRESS 2..7 SEC
MANUAL TEACH
-
Leuze electronic
Leuze
> 12 s

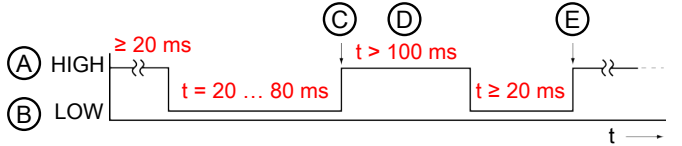
6


ON
OUT
WARN
GSU 14E
PRESS 2..7 SEC
MANUAL TEACH
+
< 2 s
ON
OUT
WARN
GSU 14E
PRESS 2..7 SEC
MANUAL TEACH
–
< 2 s

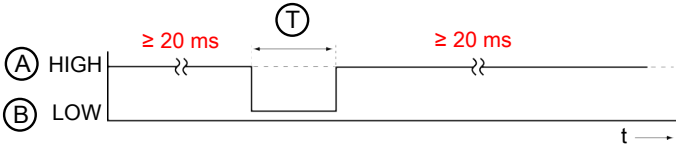
7


ON
OUT
WARN
GSU 14E
PRESS 2..7 SEC
MANUAL TEACH
+
> 7 s

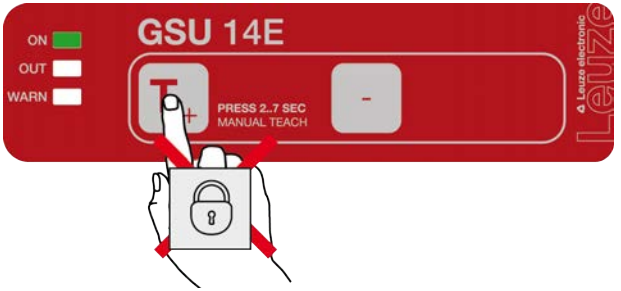
8


A HIGH
B LOW
≥ 20 ms
t = 20 … 80 ms
C
D
t > 100 ms
E
t ≥ 20 ms
t

9


≥ 20 ms
T
≥ 20 ms
A HIGH
B LOW
t

10


ON
OUT
WARN
GSU 14E
T
+
PRESS 2..7 SEC
MANUAL TEACH
-
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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.

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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 operating structure

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A	Standard function Normal operation after switch-on
B	Manual teach Can be executed as dynamic teach
C	Set switching behavior (light/dark switching)
D	Manual locking/unlocking of the buttons on the device

GSU 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.

Manual teach while the label tape is passing through (dynamic)

Preparation: Insert label tape into the sensor.

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- 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.
- Briefly press the teach button to end the manual teach. The sensor switches to the standard function.

Approx. 3 … 7 labels should be advanced through the sensor in order to achieve stable switching points. The number of labels to be transported is always based on the material combination.
If the teach event is faulty (e.g. unfavorable material combination, uneven transport, jittering during transport), the red WARN LED illuminates.

- Repeat the teach event.

If the fault cannot be rectified, e.g., via the *easyTune* function, the label material cannot be detected with the device.

NOTICE	
	During the manual teach process, a 2-point calibration is performed on the carrier and the label.

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

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- 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)

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.

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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.

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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
C	Teach is started
D	Teach duration **Note**: During the teach duration, the label tape must be transported through the sensor (see chapter "Manual teach while the label tape is passing through (dynamic)").
E	Teach is ended

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

Duration T [ms]	Function
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

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.