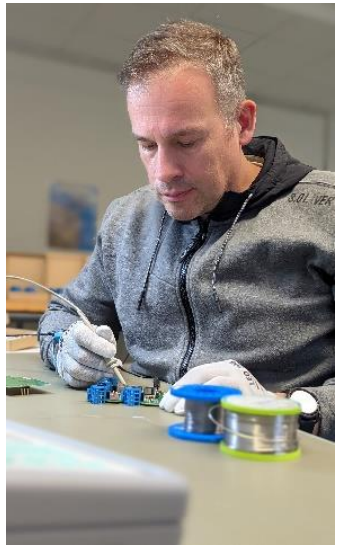




Product Presentation

LevelCheck LC 510

mütec
Your safe choice

Agenda

1. Applications of a microwave barrier
2. How does it work?
3. What is unique about it?
4. Benefits
5. Available options
6. Technical data
7. Tipps for Installation
8. References

Typical applications of a microwave barrier

- A microwave barrier can be used to
  - **monitor the fill level** of silos, bunkers, crushers or heaps (point level detection),
  - **detect material jam or overflow on** conveyor belts or at transfer stations,
  - **position or count objects** or **hedge** dangerous areas.

Typical applications of a microwave barrier

A microwave barrier is the best choice

- if measurement needs to be **contact-free**, e.g. through safety window or pipe walls,
- if the environment is **dirty** or **dusty**,
- if the the product tends to **build-up** on measurement equipment,
- if supervision shall be from or over a **distance of several meters,**
- if the measurement needs to be **100% reliable.**

Typical applications of a microwave barrier

- **Typical industries** for the LC 510 microwave barrier:
  - Animal feed
  - Building materials
  - Cement industry
  - Ceramics
  - Chemical industry
  - Detergent industry
  - Food industry
  - Glass production
  - Metal production
    Minerals and Mining
  - Pharmaceuticals
  - Pigment production
  - Power plants
  - Pulp and paper
  - Recycling industry
  - Synthetic materials
  - Textiles
  - Waste incineration
  - Etc.

Typical applications of a microwave barrier

- **Typical applications** for the LC 510 microwave barrier:
  - Animal feed production: prevent overfilling of animal feed containers
  - Animal feed production: monitor min / max level in the hopper
  - Cement industry: min / max control of dosage of fluff into the bunker
  - Cement industry: position silo trucks at correct place at loading station
  - Coal power plants: prevent backup or overfilling with coal of belt transfer stations
  - Coal power plants: prevent overfilling of silos with lime milk (gas desulfurization)
  - Ethanol plants: ensure minimum filling level of buffer silos with grain flour
  - Glass production: ensure continuous supply to furnace by monitoring feed pipe
  - Gravel and sand pits: monitor conveyor belt and automate stockpiling levels
  - Gravel and sand pits: monitor filling level of rock crushers
  - Mining: position the dumper truck correctly before the hopper
  - Pet feed production: supervise conveyor with finished meat pellets
  - Pulp and paper: prevent jamming of pulp bales on conveyor before the pulper
  - Waste incineration: monitor minimum level in incinerator feed chute

References (FS / LC 510)

BIO-MÜHLE SEIT 1969
Bauck HOF

CORODUR
DAS ORIGINAL FÜLLDRAHT GMBH

HEIDELBERGCEMENT

Hüttenwerke
Krupp Mannesmann

KAMPF

J. MÜLLER

KÜNKELWAGNER®
WEITER DENKEN.

NISBAU

Nordzucker

Novelis

ORIGINAL-PALLMANN
PALLMANN
MAHLWERKE

सेल SAIL

Schwörer Haus® KG

trimet

thyssenkrupp

UNA-HAKRA

Microwave barriers – How do they work?

- The measurement principle of the LevelCheck LC 510:
  - Microwave barrier - works **similar to a photoelectric barrier**
  - An **emitter** sends out a **low-power, non-invasive microwave beam**
  - The beam is **received by an opposite device**, which can be placed **up to 25 meter away**
  - **Any object between emitter and receiver** weakens the microwave signal and **is detected**
  - If a set value is reached, a **relay is switched**
  - The **switching point** can be adjusted by adapting **amplification, filter, hysteresis** and **delay**

Microwave barriers – what are the general benefits?

- General benefits of microwave barriers:
  - **Very flexible**, can be used with any kind of solid, mineral-reach liquid or other objects
  - **Very reliable and precise measurement**, is not affected by material buildup, nor by dust
  - **Contact-free,** does not interfere with the process
  - Works perfectly **from a distance** (up to 25m between emitter and receiver)
  - Measures **through plastic, glass and all non-conductive materials**, sensor can be decoupled from the process
  - **Wear- and maintenance-free,** long lifetime**,** also with abrasive or aggressive material

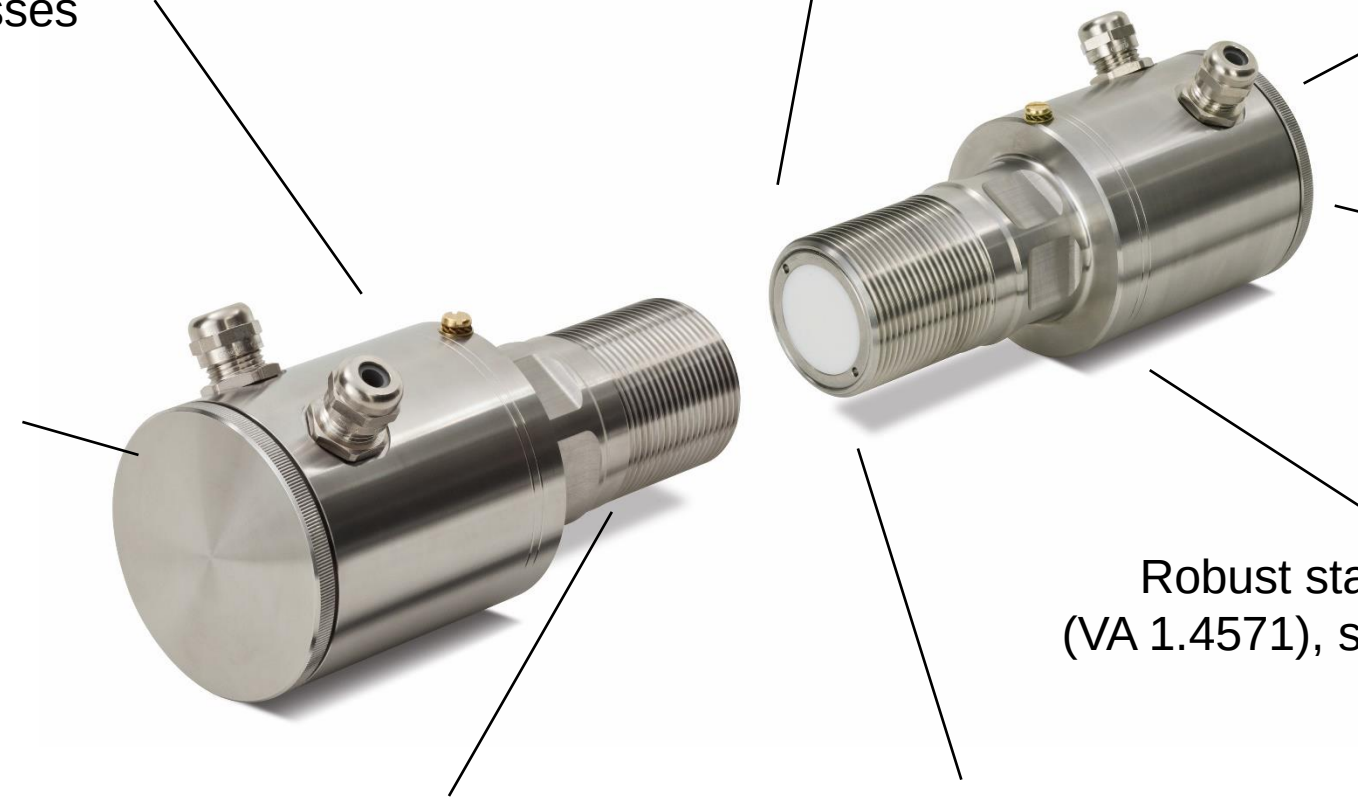
LevelCheck LC 510

LevelCheck LC 510 – What is unique about it?

Compact design, only D75 x 146 mm, can be easily retrofitted into existing processes

External G 1½” thread for easy installation

Switching signal and error signal at two relay outputs



Well-protected design, insulation for IP65

Integrated control electronic, no separate transmitter

Robust stainless steel construction (VA 1.4571), suitable for most applications

7 different socket types for any application (steel, V2A, V4A with different lengths and angles)

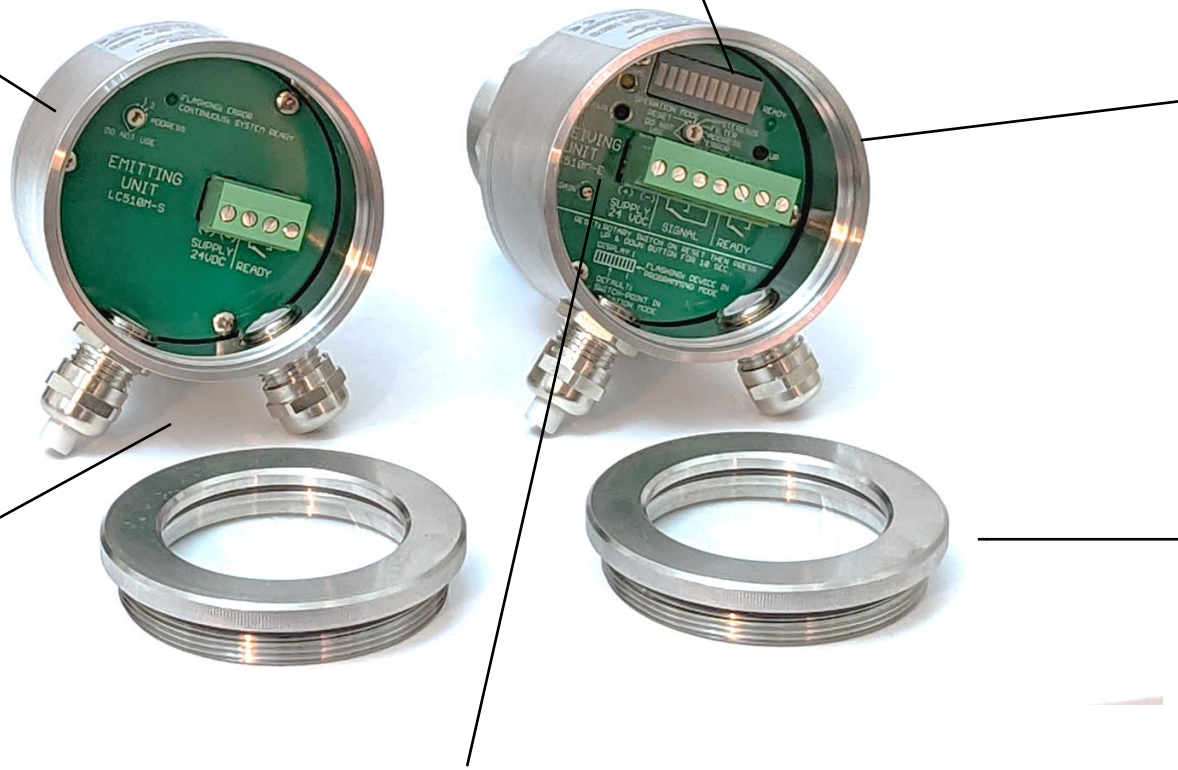
Teflon or optional ceramic surface to withstand abrasive materials and for high pressure applications

LevelCheck LC 510 – What is unique about it?

The measurement is visualized at the device using an easy-to-read LED bar

Active self-monitoring for increased reliability (e.g. cable brake of supply line), alarm signal is available on additional relay

For process temperatures of -20°C to +85°C and pressure up to 6/12 or optionally 30/60 bar (permanently/ temporarily)



Emitter and receiver are coupled by selecting common address and identical polarizing angle. No electrical connection needed.

Metal cover or glass window in front of LED bar and switches *

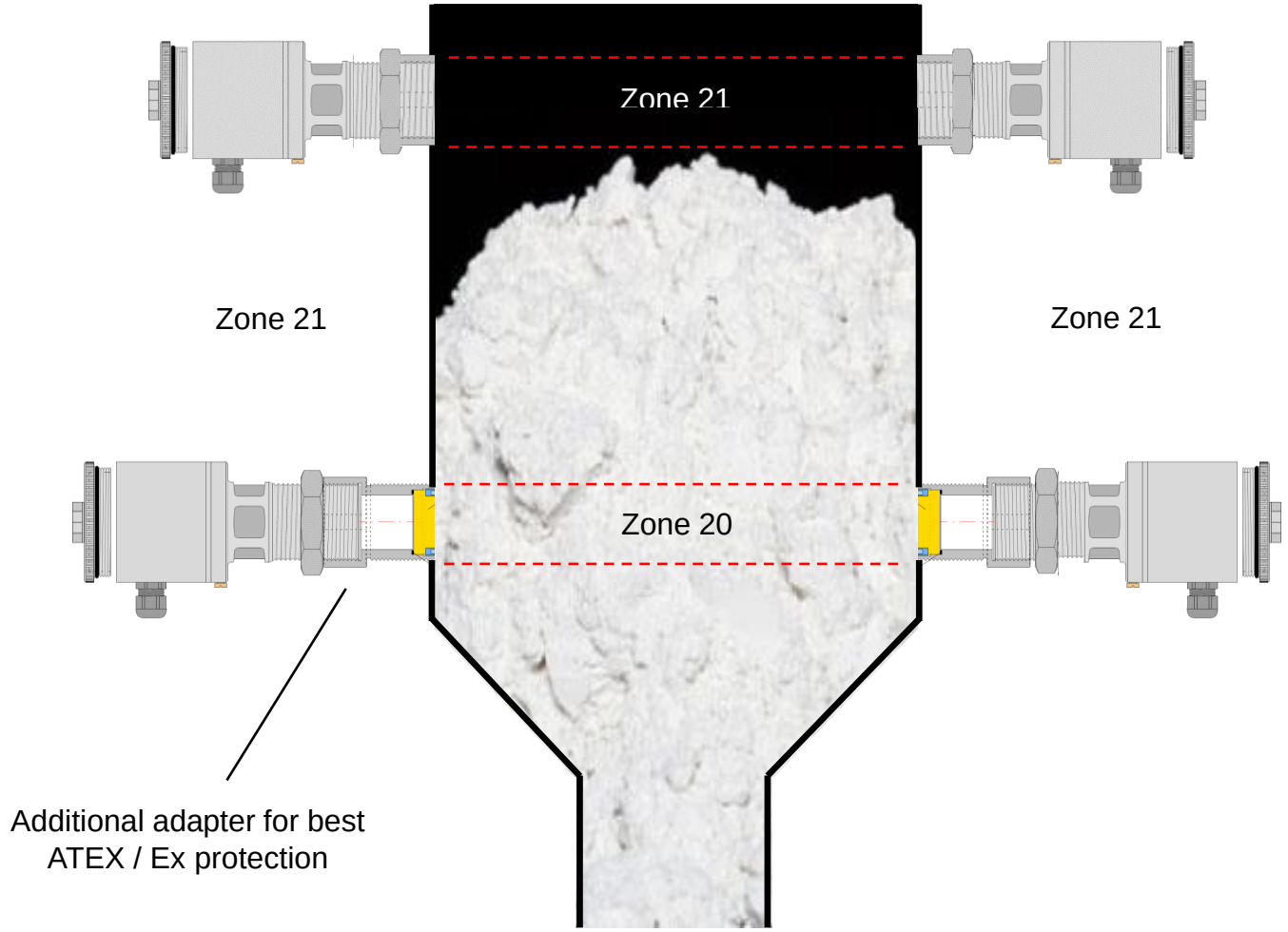
Highly flexible with adjustable amplification, filter (0-16s), hysteresis (0- +/-40%), delay (0-16s)

** Glass window only for Non-ATEX version*

LevelCheck LC 510 – What is unique about it?

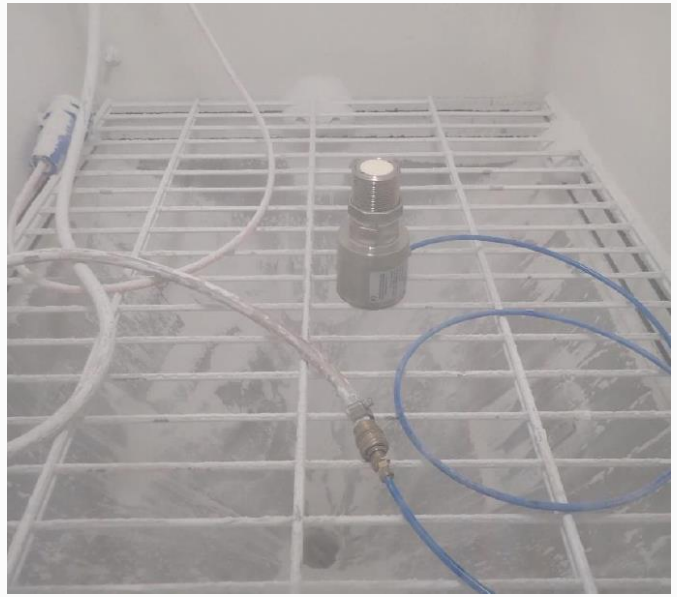
Two options for use in ATEX / Ex-Zone available. The LC 510 offers the **best Ex protection in the market**:

- ATEX Zone 21 or
- ATEX Zone 20 / 21 (with additional adapter and socket)



LevelCheck LC 510 – What is unique about it?

Most robust system in the market –
it was built and tested for extreme environments



Dust test of LC 510

Waterjet test

Overpressure test

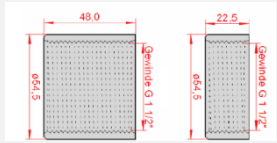
Tested until 100bar

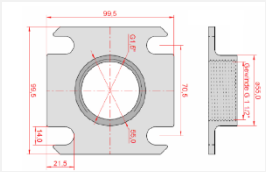
Benefits of LevelCheck LC 510

- Very **sensitive**, works **up to 25 meter distance**
- Is **not affected by dirt, dust or steam**
- **Robust design,** well protected for years of operation in a harsh environments
- **100% operational safety** due to **active self-monitoring** and second relay output
- **Highest pressure level** (up to 30/60 bar) possible - for operation in extreme environments
- Best-in-class **Ex / ATEX protection** (up to zone 20)
- **Stepless adjustment**, with variable settings for amplification, filter, hysteresis and delay
- **Compact and easy to install** and retrofit into existing installations**,** supported by multiple welding flanges and mounting plates

Options available for LevelCheck LC 510

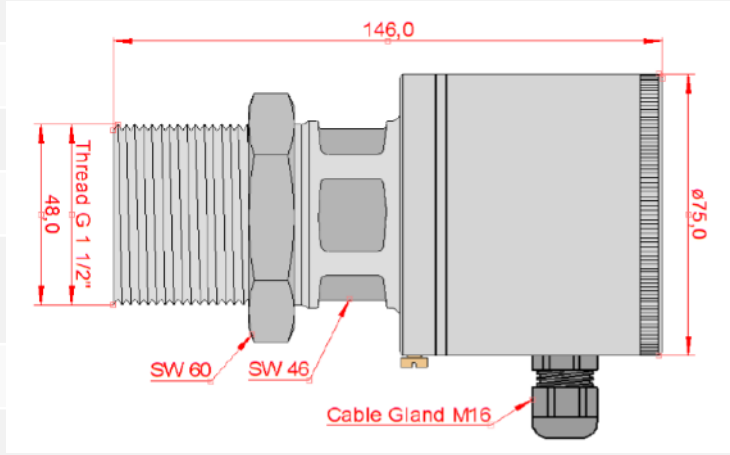
LevelCheck LC 510	
Sensor material	Teflon / PTFE (standard) Ceramic (140004)
Cover plate	Stainless steel without window (standard) Stainless steel with glas window (optional for Non ATEX version)
Pressure	0 - 6 bar permanently, 12 bar temporarily 0 - 30 bar permanently, 60 bar temporarily (140018)
Ex / ATEX	Non ATEX (standard) Ex / ATEX for zone 21 (V14037) Ex / ATEX for zone 20/21 (V14037) and special adapter AD 510 (V14038) necessary
Installation	Welded socket type 1 (180000): 22.5mm long ; material: steel Welded socket type 2 (140019): 22.5mm long ; material: V4A stainless steel Welded socket type 3 (140013): 48.0mm long ; material: steel Welded socket type 4 (140023): 48.0mm long ; material: V4A stainless steel Mounting plate with socket type 7 (V14031): socket to 99.5mm * 99.5mm mounting plate; material: V2A stainless steel Type 1-4 for installation into steel silo flush with wall. Type 7 for installation in a plastic silo.





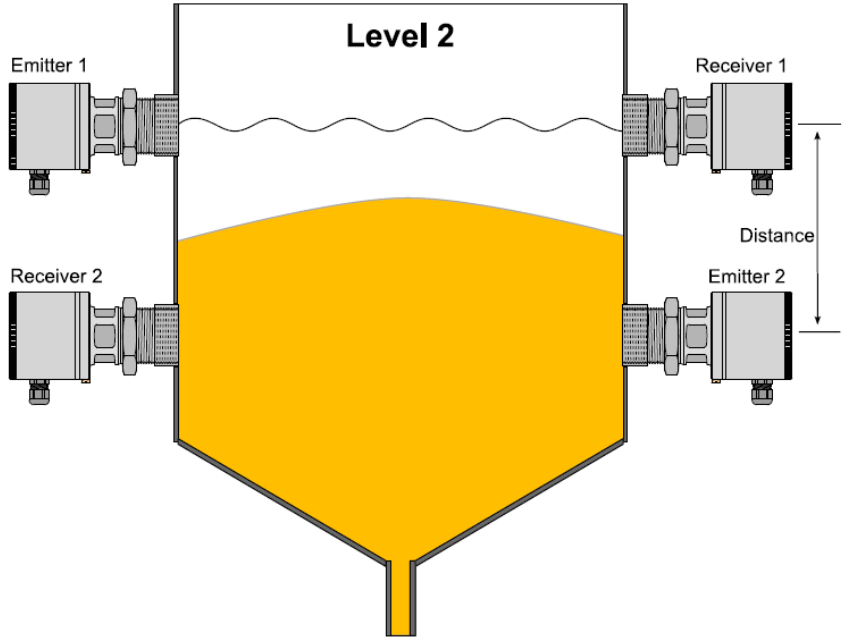
Technical Data LevelCheck LC 510

LevelCheck LC 510	
Supply voltage	24 VDC (18 VDC – 30 VDC); max. 80 mA
Output	1x changeover signal contact; 1x normally open monitoring / „ready“ contact
Switching voltage, power, current	30 V AC/DC; min. 10 µA & max. (2A); 30 VA or 30 W
Cable inlets & connection	2x M16; cable glands, plugable screw terminals
Cable length	No cable supplied
Connection	G 1 ½“ external thread to screw into a socket and to be fixed with a nut
Housing material	Stainless steel (V1.4307)
Sensor surface	Teflon (PTFE), ceramic as option
Transmission frequency and power	24.125 GHz (24.00 GHz - 24.25 GHz); 10 dBm
Dimension & weight	D75 x 146mm; 1,3 kg
Ambient temperature	-20°C to +60°C (non-condensing)
Process temperature	-20°C to +85°C
Pressure	0 - 6 bar (30 bar as option) permanently 0 - 12 bar (60 bar as option) temporarily
Protection class	IP 65
Ex-area / ATEX zone	Zone 21 or Zone 20/21 as option
Measuring range	15 cm to 25 m
Adjustment	Manual adjustment of amplification, filter (0-16s), hysteresis (0- +/-40%) and delay (100ms - 50s)



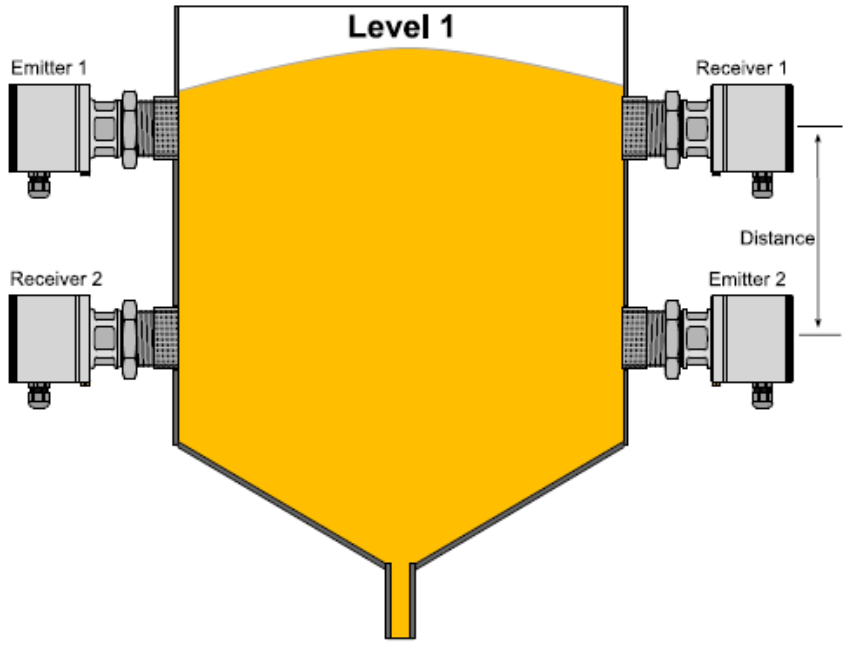
Tipps for installation

- Sensors are mounted on an optical axis
- Maximum distance of 25 meter
- The filling flow (into the silo) should to be far away from the measurement / optical axis
- If the wall is of non-microwave-permeable material, e.g. steel, a hole is required, otherwise the sensors are installed from outside measuring through the wall
- Installed flush with the interior wall (e.g. in a silo)
- To decouple adjacent pairs, one sensor pair is turned by at least 30°, better 45° to change its polarization and reduce any distraction by reflected microwaves. A pair is always turned in the same direction.

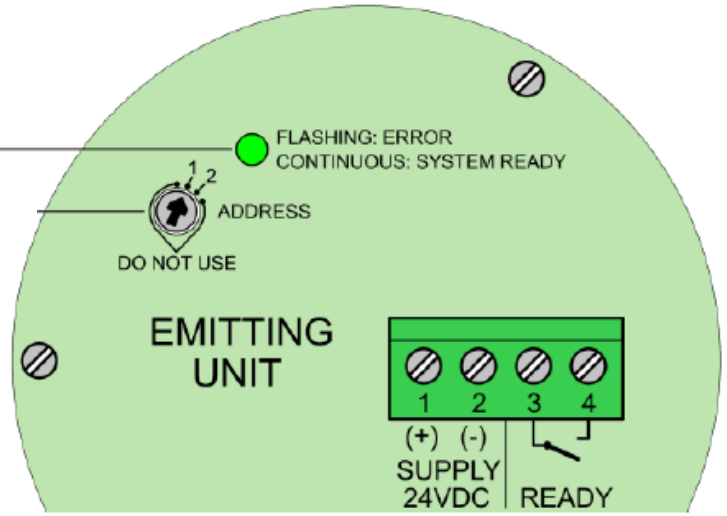


Tipps for installation

- Two sensor pairs should be placed at least 0,25 times of the monitored distance apart
- The housing of all sensors must be earthed
- To prevent water from entering the cable gland, these should be pointing downwards
- Use of shielded cables is recommended
- Cascade the “Ready” contacts, and position the emitter first to give it a higher priority

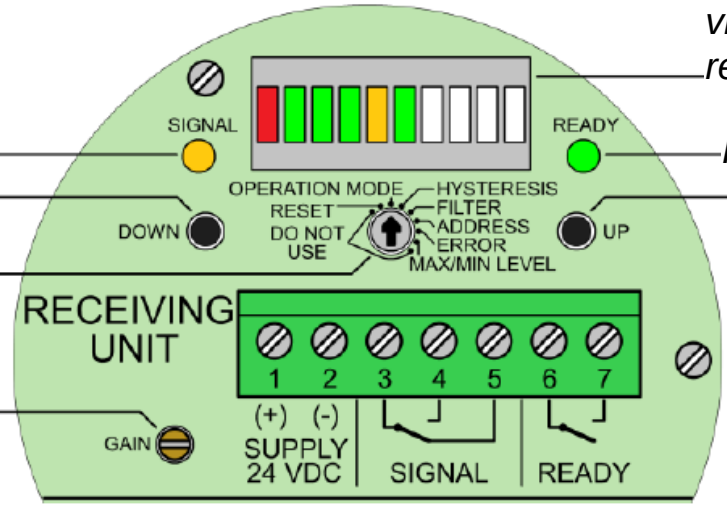


Tipps for installation – Possible adjustments



Ready / Error LED

Select between two adresses for emitter & receiver



Bargraph to visualize sensor reading etc.

Microwave signal received

Ready / Error LED

Button „DOWN“

Button „UP“

Selection switch to change adress, hysteriss, filter, maximum level or to reset

Level adjuster

References

- Una Hakra - Hanseatische Kraftfutter-gesellschaft mbH, Germany
- Produces all sorts of feed for pigs
- Microwave barrier LC 510 was installed on a hopper to ensure correct filling level with raw materials
- Dosing is switched off if the desired level is reached
- Heavily dust-laden ambient air does not distract the microwave barrier
- Ensures continuous supply with raw material while preventing an overfilling

Microwave barrier with LC 510 for level monitoring of fattening feed in the hopper





Thanks a lot!

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www.linkedin.com/company/muetec