

BRIGHTERBINS

ToF Fill-Level Sensor — Technical Datasheet

by SmartEnds

Document Control

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Product Name	BrighterBins ToF (Time-of-Flight) Fill-Level Sensor
Manufacturer	SmartEnds BV
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1. Product Identification & Overview



The BrighterBins ToF (Time-of-Flight) Fill-Level Sensor is a wireless sensor that monitors fill levels in waste bins using a laser-based time-of-flight sensor for improved accuracy across varied waste types. Its adjustable transducer fits approximately 90% of bins, and the movable transducer tunnel allows flexible mounting in various orientations. The sensor connects over LoRaWAN, NB-IoT, or LTE-M and is designed for several years of operation on a single non-rechargeable battery.

1.1 Key Features

- Laser-based ToF sensor: range 4–400 cm, typical accuracy $\pm 3\%$
- Field of view 27° , reducible to 15°
- Depth-map capability: can generate 3D depth maps of bins/containers
- Fire alarm and temperature-sensor protection
- Bin pickup and tampering reporting
- Configurable fill-level transmit threshold and reporting as raw distance or % fill level
- Concatenated raw distance points in 1 transmission to save battery life
- External antenna in case of low connectivity regions
- Measures varied waste types (e.g., residual, PMD, glass, cardboard)
- Device life over 5 years; sleep current $35 \mu\text{A}$
- Device firmware upgrade (DFU) over BLE

2. Technical Specifications

Values below are presented in SI (metric) units.

Parameter	Value
Sensor type	ToF (Time-of-Flight, laser-based)
Sensing range	4 – 400 cm
Accuracy	Typically, $\pm 3\%$
Field of view	27° (reducible to 15°)
Operating temperature	–20 °C to +60 °C
Weight	400 g
Dimensions (L×W×H)	130 × 70 × 53 mm
Casing material	ABS
Battery	14.5 Ah (non-rechargeable)
Ingress protection	IP68
Impact resistance	IK10
Device life	> 5 years (at 4 TX/day, usage-dependent)
Sleep current	35 μ A

2.1 Connectivity

Network	Supported Bands
LoRaWAN	863–930 MHz
NB-IoT	Cat NB2: B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B28/B66/B70/B85
LTE-M	Cat M1: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66 Cat NB1/NB2: B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B28/B66
Transmission protocol	UDP/MQTT (NB-IoT and LTE-M)

3. Materials & Construction

- Housing: ABS, IP68-rated
- Impact resistance: IK10
- Mounting: adjustable transducer angles (30°/60°/90°); installed via screws or rivets (Velcro tape for lab/test mounting only)

4. Regulatory Compliance & Certifications

Topic	Requirement / Reference
Conformity marking	CE mark
Enclosure rating standard	IP68
Impact protection (IK rating)	IK10

5. Ordering Information

- Part number / SKU: BBLETV2I
- Network variant ordering codes (LoRaWAN / NB-IoT / LTE-M): BBLETV2I / BBNGTV2I / BBMGTV2I
- Accessories: Rivets or screws, nuts and washers for mounting
- Packaging & shipping weight: 500g

6. Warranty & Support

- Warranty period: 1 year
- Technical / integration support: support@smartends.com
- Headquarters: SmartEnds, Vlasgaardstraat 52, 9000 Ghent, Belgium