

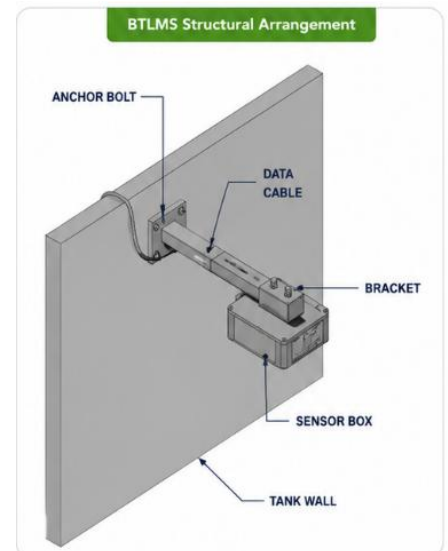


BULFRO TANK LEVEL MONITORING SYSTEM (BTLMMS)

Smart Tank Level Monitoring & IoT Solutions

The Bulfro Tank Level Monitoring System (BTLMMS) brings accurate, real-time visibility to tank and reservoir levels, enabling seamless control and management of water harvesting and storage operations. BTLMMS combines advanced non-contact sensing with the power of IoT connectivity, and is available with two sensor options — a radar level sensor with a maximum range of 40 metres, or an ultrasonic level sensor with a maximum range of 8 metres, delivering accuracy up to ± 5 mm on stable, flat liquid surfaces.

BTLMMS supports two communication protocols: direct GPRS 4G transmission from the sensor to the Bulfro Cloud, or a LoRa-enabled (indirect) configuration in which sensors communicate internally over LoRa to a receiver that relays data to the cloud over GPRS 4G. The Bulfro Cloud performs the required analytics and generates actionable alerts — including tank-full and tank-empty notifications — for efficient, conservation-focused water resource management.



WHY CHOOSE BTLMMS?

- **Reliable Performance** - Accurate, dependable tank level monitoring for effective water resource management.
- **Effortless Integration** - Integrates with existing infrastructure for immediate benefits and operational control.
- **Smart Insights** - Every unit is uniquely identified for quality assurance and easy support.
- **Secure & Scalable** - Designed with security in mind, and highly scalable to meet the evolving needs of your operation

KEY FEATURES

- **Advanced Level Sensing** - Provides precise and reliable tank level measurement.
- **Data Logging & Analytics** - Stores historical data for trend analysis and better decision-making.
- **Rugged IP-Rated Enclosure** - Built to perform reliably in harsh outdoor environments.
- **Smart Alerts & Notifications** - Receive instant alerts for low, high, or critical water levels.

COMMUNICATION ARCHITECTURE

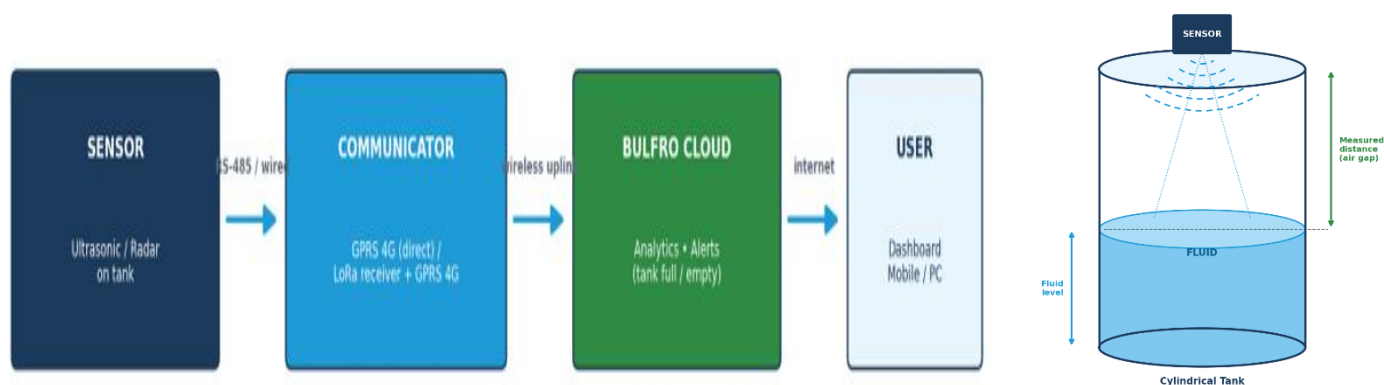
Protocol 1 — GPRS 4G (Direct)	Protocol 2 — LoRa Enabled (Indirect)
Direct communication from the sensor to the Bulfro Cloud over GPRS 4G — each unit transmits its data straight to the cloud. The simplest architecture for standalone tanks and distributed installations.	LoRa for internal communication and GPRS 4G for external: sensors transmit to a LoRa receiver, which relays consolidated data to the Bulfro Cloud — ideal for multi-tank sites and campuses.
Bulfro Cloud — analytics, usage insights & instant alerts (tank full / tank empty) on mobile or PC	

SENSOR OPTIONS

Parameter	Radar Level Sensor	Ultrasonic Level Sensor
Sensing Principle	Non-contact radar	Non-contact ultrasonic
Maximum Range	40 m	8 m
Accuracy	High accuracy; unaffected by vapour, foam & temperature	Up to ± 5 mm (stable, flat liquid surface)
Best Suited For	Deep tanks, reservoirs, large storage	Standard tanks & water harvesting systems

TECHNICAL SPECIFICATIONS

SYSTEM SPECIFICATION		ULTRASONIC SENSOR SPECIFICATIONS	
Grid operated — input	230 V AC	Operating voltage	8–12 V
Frame	Powder-coated metal, easily detachable	Standby current	≤ 5 mA
Ingress protection	IP65 (system enclosure)	Average current	≤ 8 mA
Sensor system	Non-contact (ultrasonic / radar)	Blind zone distance	30 cm
Parameter setting	Online	Ranging distance (flat object)	30–750 cm
Data update frequency	Every 15 minutes	Response time	100 ms
Database storage	Available for 2 years	Probe centre frequency	40 kHz $\pm$ 1.0 kHz
IoT communication	GPRS 4G / LoRa + GPRS 4G	Operating temperature	-15 to $+60$ °C
IoT service provider	Airtel / Vodafone	Storage temperature	-25 to $+80$ °C
		Sensing angle	100°
		Protection rate	IP67 (sensor)



KEY HIGHLIGHTS

IoT Enabled	Remote Monitoring	Data Analytics	Water Conservation	Secure Data Handling	Scalable Architecture
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