

# Radar Sensors for Tank Level Measurement



## Improve Accuracy and Reliability of Tank Level Measurement

Access to more accurate material level data enables a better understanding of material usage, which informs efficient delivery scheduling, improves materials management, and enhances other supply chain predictions.

- Enable accurate, real-time tank level measurements of liquid or dry materials
- Monitor your tank level both locally and remotely
- Reduce labor spent manually checking material levels



# Liquid Level Measurement

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Radar sensors offer a unique benefit over other sensing technologies: when mounted externally on certain plastic tanks, they can **sense through the tank wall and measure the level, keeping the sensor separate from the material** altogether. With its immunity to dust, dirt, and steam, radar technology also provides **superior and consistent measurement in almost any environment.**

A T30R mounted on a tall tank can use its narrow beam width and long sensing range to measure chemicals or other caustic agents that could damage an internally-mounted sensor. Even if the tank wall is dusty or dirty, the T30R's high-frequency microwaves can still pass through and measure the liquid inside.



## Recommended Liquid Level Sensors



### Use the T30R for:

- Tanks up to 25 m tall
- Narrow 15° x 15° beam width is ideal for liquid level measurement
- Robust, IP69K housing of the T30RW can withstand harsh environments
- T30RW with M40 or NPT 1.5" process fittings suitable for a variety of equipment needs



### Use the K50R for:

- Cost efficient alternative to ultrasonics for liquid level measurement in short range applications



# Dry Goods Level Measurement

Levels of dry, granular materials, such as plastic pellets used in injection molding or feed used at a fish farm, are more challenging to detect than liquids. **Unlike leveling out like liquids, they form a peak as they accumulate and drain in the reverse, causing the center to empty first and leaving the edges higher.** These ever-changing angles can reflect energy away from the sensor's receiver, leading to more complicated detection.

The wide beam of the Q90R reliably detects and measures dry goods in a tank by receiving more reflected signals than a sensor with a narrow beam angle. The high excess gain allows the Q90R to detect very fine, dry materials, helping ensure enough product is left for the next injection mold or alerting an operator to add more feed.



## Recommended Dry Goods Level Sensors



### Use the Q90R for:

- Tanks up to 20 m tall
- Wide beam angle and high material sensitivity offers superior performance for dry good level measurement
- IP67 and IP69K ratings prevent ingress of dust and liquids
- Capable of detecting food processing materials, plastic pellets for injection molding and wood chips

## Banner Measurement Sensor Software



Our easy-to-use software provides quick configuration for a variety of tank level monitoring applications. This powerful, free software allows you to visualize your tank level application in real-time making configuring the sensor fast and easy.

# Radar Sensors for Tank Level Measurement



## Q90R Series

### Powerful Detection and Measurement in Nearly Any Environment

- Reliable detection of dry, granular goods in a wide range of tank level monitoring applications
- Rugged IP67 and IP69K-rated housing for operation in harsh environments
- Intuitive interface enables simple integration and streamlines troubleshooting
- Enhance equipment performance with advanced configuration and detection
- IO-Link gives access to real-time process data, and allows sensor parameter adjustments and diagnostic viewing

### Q90R Models

Beam Pattern	Detection Range	Communication	Output	Model
40° x 40°	0.1 m - 20 m	IO-Link	Dual discrete	<b>Q90R-4040-6KDQ</b>
			4-20 mA analog and selectable discrete	<b>Q90R-4040-6KIQ</b>
			0-10 V analog and selectable discrete	<b>Q90R-4040-6KUG</b>

### Q90R2 Model

Beam Pattern	Detection Range	Communication	Output	Model
120° x 40°	0.1 m - 20 m	IO-Link	Dual discrete	<b>Q90R2-12040-6KDQ</b>

Note: Beam pattern is customizable to fit the size and shape of your tank

### Accessories



**SMBAMSQ90R**

Adjustable mounting bracket



**SMBRAQ90R**

Right-angle mounting bracket



**DXMR90-4K**

IO-Link master



**PRO-KIT**

Required for PC configuration



# T30R Series

## Bridges the Gap Between Radar and Ultrasonics

- Reliable detection of liquids in a wide range of tank level monitoring applications
- IP67-rated housing is unaffected by rain, wind, snow, fog, steam, sunlight, and has an operating temperature of -40 to 65° C
- T30RW model features IP69K-rated housing for use in challenging environments
- Radar Configuration Software, IO-Link, remote teach input, and push buttons for flexible set-up and configuration
- Pulse Pro output for direct integration with Banner lights; direct process feedback that only requires power; no controller needed

### T30R Models

Beam Pattern	Detection Range	Communication	Output	Model
15° x 15°	0.15–15 m	IO-Link	Dual discrete	<b>T30R-1515-KDQ</b>
			4-20 mA analog and selectable discrete	<b>T30R-1515-KIQ</b>
			0-10 V analog and selectable discrete	<b>T30R-1515-KUQ</b>
15° x 15°	0.1–6 m	IO-Link	Dual discrete	<b>T30R-1515-CKDQ</b>
			4-20 mA analog and selectable discrete	<b>T30R-1515-CKIQ</b>
			0-10 V analog and selectable discrete	<b>T30R-1515-CKUQ</b>
15° x 15°	0.15–25 m	IO-Link	Dual discrete	<b>T30R-1515-LKDQ</b>
			4-20 mA analog and selectable discrete	<b>T30R-1515-LKID</b>
			0-10 V analog and selectable discrete	<b>T30R-1515-LKUQ</b>

### T30RW Models

Beam Pattern	Detection Range	Communication	Output	Model
15° x 15°	0.15–15 m	IO-Link	Dual discrete	<b>T30RW-1515-KDQ</b>
			4-20 mA analog and selectable discrete	<b>T30RW-1515-KIQ</b>
			0-10 V analog and selectable discrete	<b>T30RW-1515-KUQ</b>

### Accessories

<b>SMB30A</b> Right-angle bracket	<b>SMB30MM</b> Right-angle bracket with curved mounting slots	<b>SMB30FA</b> Swivel bracket with tilt and pan movement	<b>SMBT30RTM</b> Tank mounting bracket	<b>SAFT30R-PVC-G2</b> M30 to 2 in. NPT adapter	<b>DXMR90-4K</b> IO-Link master	<b>PRO-KIT</b> Required for PC configuration



# Radar Sensors for Tank Level Measurement



## K50R Series

### Reliable, Cost-Efficient Sensing for Short-Range Applications

- Superior and consistent operation in any environment
- Cost-efficient alternative to long-range ultrasonic sensors
- Simple integration and streamlined troubleshooting
- Easy set up and configuration with the Banner Measurement Sensor Software
- Bright, visible indication available in Pro models with configurable LEDs
- Base and flush mount options for versatile mounting

Beam Pattern	Housing	Range	Type	Output	Model
40° x 30°	Flush mount	50 mm–5 m	Standard	Dual discrete	<b>K50RF-4030-LDQ</b>
				4–20 mA analog and selectable discrete	<b>K50RF-4030-LIQ</b>
				0–10 V analog and selectable discrete	<b>K50RF-4030-LUQ</b>
		50 mm–5 m	Pro with Configurable LEDs	Dual discrete	<b>K50RPF-4030-LDQ</b>
40° x 30°	Base mount	50 mm–5 m	Standard	Dual discrete	<b>K50RB-4030-LDQ</b>
				4–20 mA analog and selectable discrete	<b>K50RB-4030-LIQ</b>
				0–10 V analog and selectable discrete	<b>K50RB-4030-LUQ</b>
		50 mm–5 m	Pro with Configurable LEDs	Dual discrete and selectable discrete	<b>K50RPB-4030-LDQ</b>

### Accessories



**SMB30A**

Right-angle mounting bracket



**SMBK50RA**

Right-angle mounting bracket



**SMBAMS50R**

Adjustable mounting bracket



**SMBT30RTM**

Tank mounting bracket



**PRO-KIT**

Required for PC configuration

# Monitor Tank Levels Locally and Remotely

## Easily view fill levels when and where you need to

- IO-Link simplifies communication and control across the system
- IO-Link-enabled strip lighting visually communicates real-time fill levels locally
- Banner Cloud Data Services software provides remote monitoring of fill levels

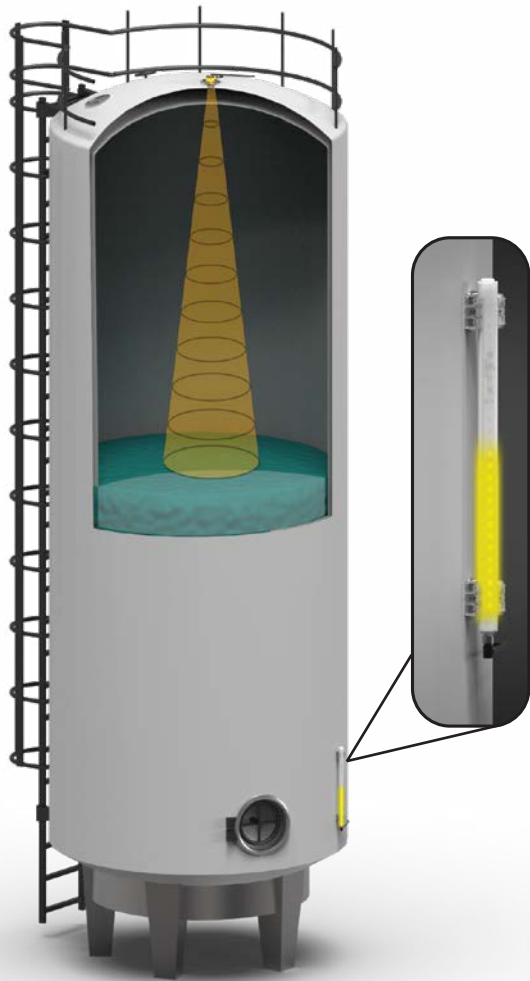


	Description (on tank)	Model
1	IO-Link radar sensor with 15° x 15° beam pattern	T30R-1515-KDQ
2	M12 double ended extension cordset	BC-M12F4-M12M4-22-xx
3	2-port IO-link Master	R45C-2K-MQ
4	Heavy duty sealed light strip	WLS27PXRGBW570DSKQ
5	M12 T splitter	CSB-M1250M1250-T
6	900 MHz Serial Data Radio	R70SR9MQ
10	18-30 V DC power supply	

	Description (remote)	Model
7	Industrial controller	DXM1200-X2R2
8	4-pin M12 D-code to RJ45 shielded ethernet cordset	STP-M12D-406
9	Banner Cloud Data Services	
10	18-30 V DC power supply	

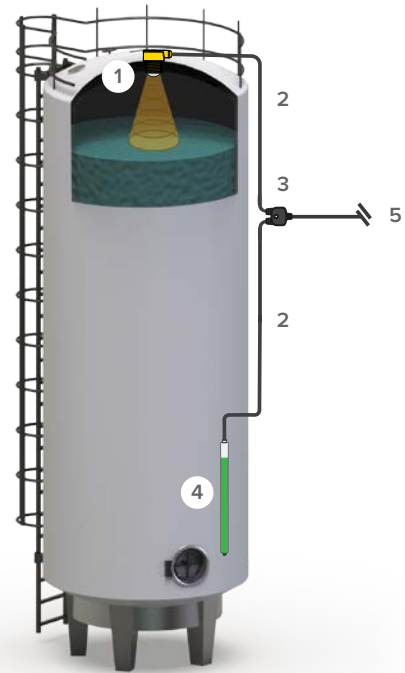
# Combine Lights with Radar Sensors to See Tank Level at a Glance

- Complete plug-and-play solution compatible with a variety of sensors and Pro lights
- No external controller required
- LED lighting visible at extended distances



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	Description (on tank)	Model
1	Radar sensor with 15° x 15° beam pattern	T30R-1515-KDQ
2	M12 double ended extension cordset	BC-M12F4-M12M4-22-xx
3	M12 splitter	CSB-M1241M1241
4	Heavy duty sealed light strip	WLS27PXRGBW850DSQ
5	18-30 V DC power supply	



**PULSE<sup>®</sup>**  
**PRO I/O**



TL50 WLS27 WLS15



## Visually Communicate Fill Level without a Controller

Pulse Pro I/O uses Pulse Frequency Modulation (PFM) to digitally represent an analog measurement value from a discrete sensor. Banner Engineering uses this technology to simplify the connection and communication between a sensor and an indicator, allowing for immediate visual feedback of a measurement without the need for a controller. Installing this combination of a Pulse Pro I/O-enabled sensor and light on a tank gives operators high-visibility, at-a-glance level indication. The unmistakable illumination streamlines factory communication by promoting faster response to status changes and reduces the risk of costly downtime when tanks run empty.



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