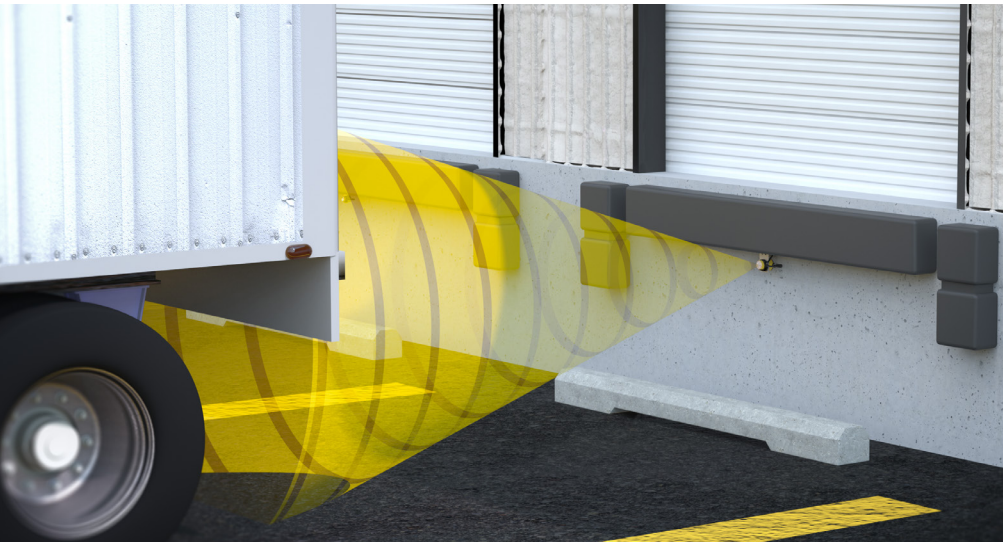
Radar Sensor Solutions



Radar Sensing

The ultimate outdoor sensing solution

Benefits of Radar Sensing

Resistant to wind, rain, snow, fog, and sunlight

Long sensing range

No moving parts, durable, less downtime

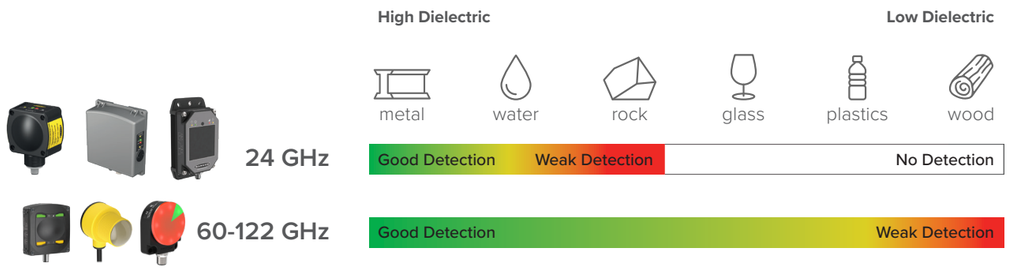
Operates with a wide temperature range to function in extreme environments

Highly resistant to interference or crosstalk

Detects moving and stationary objects

Operating Frequency

Different radar frequencies affect not only the range of the sensor but also what materials it can detect. 24 GHz radar has a long range and ignores ambient weather like heavy rain or snow. However, its detection is limited to stronger radar targets. 122 GHz radar provides greatly increased accuracy and can see a much wider range of materials compared to 24 GHz. 60 GHz conveniently falls between 24 GHz and 122 GHz in terms of performance. It has remarkable resistance to ambient weather and can detect a similar range of materials to 122 GHz with a better accuracy than 24 GHz.



Metal, water, and other high-dielectric materials provide a stronger return signal than plastic, wood, or other organic materials.

Beam Pattern Considerations

Radar sensors are available in narrow and wide beam patterns. Narrow beam patterns avoid false detection of objects outside of the region of interest and allow for a more precise measurement. Wide beam patterns provide coverage of larger areas and provide more reliable detection of irregular surfaces and targets presented at steep angles.

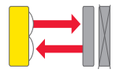
Narrow Beam Applications

- Drive-thru
- Overhead crane
- Tank level
- Gantry crane
- Loading docks

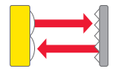
Wide Beam Applications

- Mobile equipment collision avoidance
- Vehicle detection: trains, cars, boats

Adjustable-Field (Diffuse) and Retroreflective Radar Sensors



An adjustable-field radar sensor can detect vehicles and other objects by sensing the reflection of the radio waves bouncing off the object.



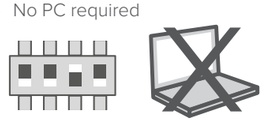
A retroreflective radar sensor uses a taught reference condition like a wall, floor, or special retroreflective target. The sensor detects objects between it and the reference target by looking for disruptions in the signal coming back from the reference target.

Retroreflective sensing has the most reliable detection with no dead zone. The output will turn on even if the object being sensed does not reflect the signal back to the sensor, as long as it blocks or disrupts the signal from the reference target.

Configuration

DIP Switch Configuration

- Easy to set up
- No PC required



Banner Measurement Sensor Software

- Clear visual of the entire sensor view for setup and troubleshooting
- Tamper-proof

Remote Teach

- Remotely configure sensor
- No manual interaction required

IO-Link

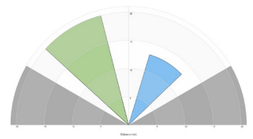
- Read and change device remotely
- Dynamically change parameters

IO-Link®

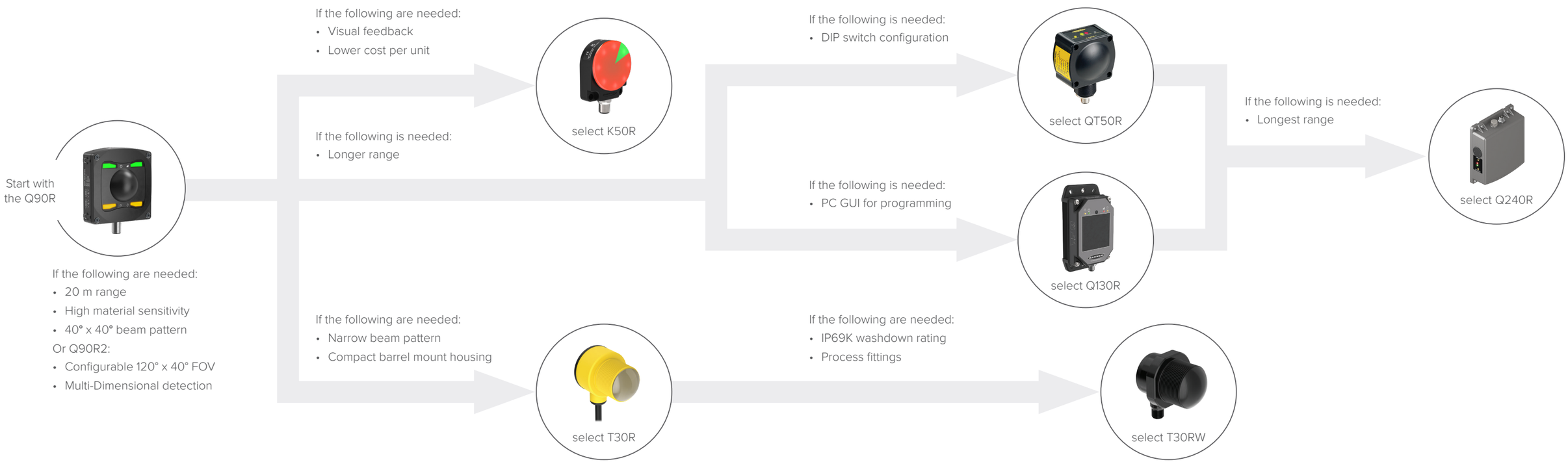
Push Button

- Simple configuration
- Click and teach

Configurable, Multi-Dimensional Detection



Choosing a Banner Radar Sensor



	Q90R	Q90R2	T30R	T30RW
Frequency	60 GHz		122 GHz	
Sensing Range (m)	20		6, 10, 15, or 25	15
Configurable Sensing Zones	2		2	
Beam Pattern (Horz x Vert)	40° x 40°	120° x 40° (Configurable)	15° x 15° or 45° x 45°	15° x 15°
Interfaces	Discrete, analog, Pulse-Pro, IO-Link		Discrete, analog, Pulse-Pro, IO-Link	
Sensitivity	✓✓✓		✓✓✓	
Accuracy	✓✓✓		✓✓✓	
Ambient Weather Performance	✓✓		✓✓	
Configuration	PC GUI, remote input		PC GUI, push buttons, remote input	

	K50R	Q130R	QT50R	Q240R
Frequency	60 GHz	24 GHz	24 GHz	24 GHz
Sensing Range (m)	5	24 or 40	3.5, 12, or 24	40 or 100
Configurable Sensing Zones	2	1	1 or 2	2
Beam Pattern (Horz x Vert)	80° x 60° or 40° x 30°	90° x 76° or 24° x 50°	90° x 76°	11° x 13°
Interfaces	Discrete, Pulse-Pro	Discrete	Discrete, analog	Discrete
Sensitivity	✓✓	✓	✓	✓
Accuracy	✓✓	✓	✓	✓
Ambient Weather Performance	✓✓	✓✓✓	✓✓✓	✓✓✓
Configuration	PC GUI, remote input	PC GUI, remote input	DIP switches	DIP switches

*Visit bannerengineering.com for more solutions

Vehicle Detection

Radar sensors use Frequency Modulated Continuous Wave (FMCW) technology to reliably detect targets, including cranes, cars, trains, trucks, and cargo in extreme weather conditions. FMCW radar is an ideal solution for these applications because it can detect moving and stationary objects in all weather conditions.

The ability to reliably detect vehicles offers significant advantages for asset management, resource allocation, site safety, traffic control, and loading-dock monitoring. Application needs and deployment requirements can be diverse, ranging from indoor, outdoor, and partially protected ones.

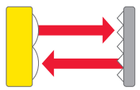
Loading Dock Monitoring, Vehicle Counting

Challenge

For an efficient flow of products in and out of a truck, it is important that operators are immediately notified of a truck's arrival. In order to accurately detect the presence of vehicles at a loading dock, a reliable sensor is needed to withstand extreme weather conditions.

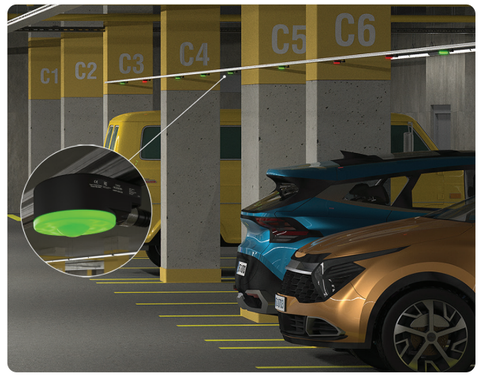
Solution

- The T30R can be set up as a retroreflective sensor to provide the most reliable detection with no dead zone
- Compact housing for simple installation



Retroreflective Sensing

Detecting Parking Spot Availability in a Public Ramp

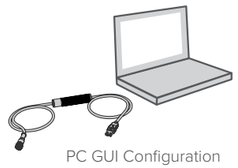


Challenge

Drivers entering major multi-level parking structures often struggle to find open parking spaces. To improve efficiency, a method is needed to inform them of real-time parking availability and guide them to the appropriate open spaces.

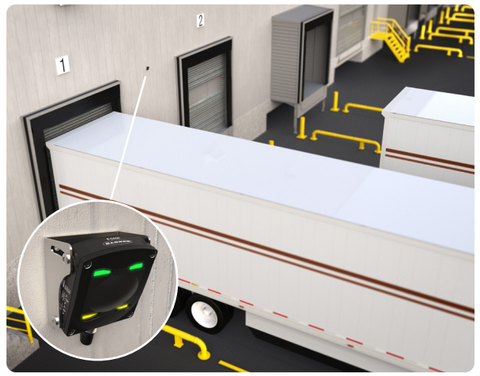
Solution

- Placing a K50R sensor above each parking space, provides an accurate method for counting the number of occupied or available parking spaces, and presenting that data to incoming drivers
- K50R sensors can be placed in ramps that are exposed to outdoor air and varying temperatures
- K50R Pro sensors feature RGB LEDs, which can be set to illuminate red or green depending on the availability (or lack of availability) of a given space
- Radar sensors provide a cost-competitive alternative to other parking-spot-sensing systems



PC GUI Configuration

Accurate Vehicle Detection at Loading Docks



Challenge

Accurate vehicle detection at loading docks is crucial for businesses to sustain productivity, safety, and environmental standards. Inaccurate detection can lead to inefficiency and hazardous situations.

Solution

- The Q90R's broad field of view and robust signal strength provides flexible mounting options in various orientations to accommodate customer requirements
- The Q90R2 can track two different targets, effectively taking the place of two sensors and offering even more application flexibility

Multi-Dimensional Detection

Train Detection Including Flatbeds and Tank Cars

Challenge

Railways present many difficulties for sensing equipment. The harsh and dirty environment is extra challenging. Passing trains create high winds and kick up dirt. Proper identification of the content on cargo trains is essential. Radar sensors detect container trains to activate RFID antennas.

Solution

- The Q130R radar sensor is an effective alternative to ultrasonic or photoelectric sensors
- Radar technology is unaffected by wind or by dust and dirt buildup on the sensor
- FMCW radar can detect both stationary and moving targets, making it a more reliable solution than doppler radar

Resistant to Weather

Vehicle Detection (continued)

Car Wash

Challenge

Reliably detecting a vehicle in a car wash can be problematic. Steam, fog, water spray, and temperature changes are challenging for some types of sensors.

Solution

- The T30RW uses radio waves to reliably detect the vehicle, ignoring fog, steam and water
- The IP67, IP69K-rated housing dependably operates in the most harsh environments
- Superior temperature stability provides consistent measurements even during extreme temperature swings

Resistant to Weather

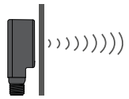
Electric Vehicle Charging

Challenge

Shared electric vehicle services require a method to keep unauthorized non-electric vehicles from parking at charging stations, which are generally located in outdoor public places.

Solution

- A K50R radar sensor installed inside a charging station can detect the presence of a vehicle parked at that station, at any time of day and in any weather condition
- If a parked vehicle is detected but not plugged in for charging, a signal is sent to a central location, alerting authorities so that the vehicle can be removed
- Because the K50R has a short operating range with a maximum distance of 2.5 meters, it can safely ignore irrelevant targets outside of the parking area
- The sensor can be housed within the body of typical charging stations to prevent potential vandalism

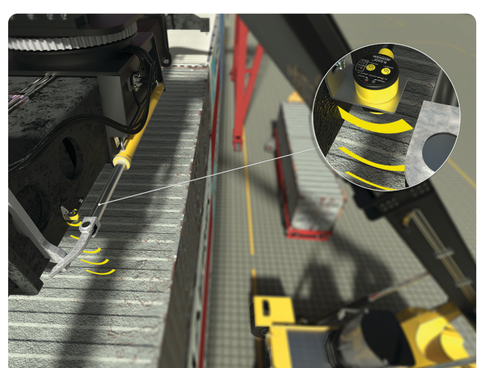


Ignore Certain Materials within Dead Zone

Positioning Feedback

Precise positioning of industrial equipment is important to prevent damage and reduce downtime, but challenging environmental conditions including rain, snow, fog, sun, and wind can make it difficult for operators to see and can have an impact on the reliability of other sensor technology. Banner radar devices provide reliable outdoor performance and the 122 GHz models provide the accurate measurements and short deadzones often required for these applications. Dual discrete outputs are available for slow and stop positions for port equipment, such as reach stackers and container handlers. Analog and IO-Link options are also available for absolute distance measurement values to guide the approach of ground support equipment, such as baggage handlers or de-icing vehicles.

Reach Stacker

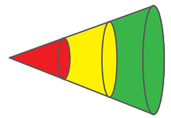


Challenge

At large ports, shipping containers need to be quickly and safely moved from one place to another. Because of this speed, lifting equipment often collides with containers, resulting in lost time and damaged goods and equipment.

Solution

- The T30R with dual discrete outputs can provide collision protection with safe speed and stop positions
- The robust IP67-rated housing and radar beam is ideal for working outdoors



Dual Zone

Ground Support Equipment

Challenge

Damaging an airplane results in expensive repairs and disruptive delays, as any contact with the aircraft requires it to be pulled from service for inspection. New standards are requiring ground support equipment such as baggage handlers to be equipped with collision-avoidance sensors such as the Q90R2.

Solution

- The Q902R measures the distance of ground support equipment from the aircraft and signals an alert when it reaches a programmed distance to prevent collisions
- The Q90R2's configurable 120 ° beam pattern reliably detects curved surfaces, such as the body of an airplane
- Radar sensors are resistant to ambient weather and temperature changes

Precise Detection

Wide Beam Radar Sensors

Collision Avoidance

In many industries including ports, mining, and agriculture, mobile equipment is a large investment, and damage to that equipment results in downtime and requires costly repair or replacement. Banner Engineering's radar sensors are the perfect rugged solution for collision avoidance, even in harsh outdoor conditions. Sensing functions are unaffected by wind, rain or snow, fog, sunlight, humidity, and fluctuating air temperatures. The sensors also utilize a robust steady-state design that is more durable than laser products with moving parts.

Reliable Forklift Collision Awareness

Challenge

Forklifts used in manufacturing settings can pose a risk of damaging nearby equipment. Many obstructions in the environment may not be accurately detected by optical or ultrasonic technologies. Additionally, other sensing technologies struggle in the diverse environments where forklifts operate, particularly outdoors.

Solution

- The Q90R2 is an effective solution for driver collision awareness
- When used in conjunction with a light or audible indicator, the Q90R2 can detect almost any potential hazard and provide clear communication to operators or bystanders, keeping operations running smoothly and preventing damage to assets.

Configurable Field of View

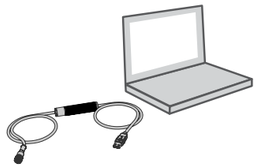
Collision Avoidance

Challenge

Collision avoidance solutions for mining equipment minimize the risk of accidents, save costs, and improve efficiency. Poor visibility, blind spots, dust and debris, and ambient weather conditions can reduce the effectiveness of collision-avoidance measures.

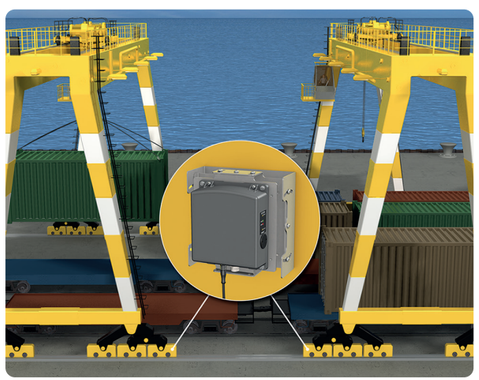
Solution

- Q130RA radar sensors are installed at the front and rear of mining vehicles and provide active object detection in vehicle blind spots
- The Q130RA is unaffected by dirt, dust, wind, rain, and other environmental challenges
- The IP67-rated housing ensures reliable operation even in harsh conditions



PC GUI Configuration

Crane-to-Crane Proximity Detection

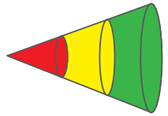


Challenge

When multiple cranes are moving in tight spaces, it's imperative to ignore adjacent shipping containers while reliably detecting the presence of another crane or obstacle to activate stop or warning signals for the operator.

Solution

- The Q240R radar sensor features a very narrow 11° by 13° beam pattern, which is ideal for monitoring a specific area without detecting adjacent objects
- With two independent, adjustable sensing zones, the sensor provides far and near proximity warning signs with the capability to detect objects up to 100 m away
- Extremely robust; provides reliable detection capabilities, which are ideal for outdoor applications



Dual Zone

RTG Collision Avoidance

Challenge

Rubber tire gantry cranes (RTG) are used in port and mobile equipment industries to transport heavy and cumbersome loads. Since RTG cranes are hauling such large loads, it is vital to ensure they move safely throughout the port area to avoid collisions.

Solution

- The Q120R radar sensor has a narrow beam pattern, high sensitivity, and long-range detection to view obstacles in the way of the crane
- The sensor has no moving parts, and its rugged design resists high-shock and vibration conditions better than laser scanners

No Moving Parts

Tank-Level Monitoring

Storage tanks, totes, and containers can be found in a wide variety of environments, from indoor or outdoor installations to above or below ground deployments. Properly monitoring and managing levels inside these tanks can help owners and asset managers increase productivity and profitability.

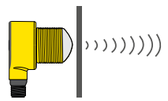
Plastic Tank Level

Challenge

Mounting a sensor inside a tank is often impractical, and it is not an ideal setup if direct contact with a liquid substance could damage or negatively affect the sensor.

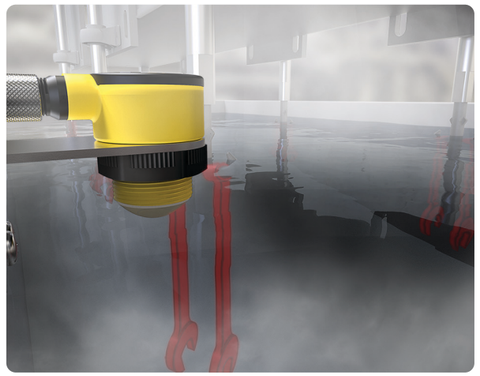
Solution

- Easily installed outside the tank with the SMBT30RTM tank bracket
- The high-frequency radio wave signal penetrates through the plastic container wall down to the liquid's surface.



Ignore Certain Materials within Dead Zone

Quench Tank Level



Challenge

When die-cast metal parts are hardened in a quench tank, the liquid level must be refilled to ensure that the parts are completely submerged. Ultrasonic and photoelectric sensors would not be effective for tank-level measurement because the process releases large amounts of steam.

Solution

- The T30R Near Range sensor uses radar to detect targets, which is effective even in the presence of steam that obscures the visibility of liquid levels
- The T30R series also excels in the presence of moisture, and it features an IP67-rated housing to protect electronic components in wet environments
- Accurate liquid level readings are especially crucial for smaller quench tanks; fortunately, the Near Range T30R features improved performance at close range, compared to the standard T30R, and a short dead zone of only 100 mm

Precise Measurement

Banner Measurement Sensor Software Overview

The Banner Measurement Sensor Software and Pro-Kit with Converter Cable allow for easy setup and configuration of range, sensitivity, and output.

- Get up and running in three easy steps: simply set the switch point distance, signal strength threshold, and response time using the intuitive configuration software. Now the radar sensor is ready to begin detecting targets.
- Easily monitor status via the software or bright on-board LED indicators.
- Visualize the application in real-time.
- Make adjustments to settings on the fly.

Navigation Toolbar

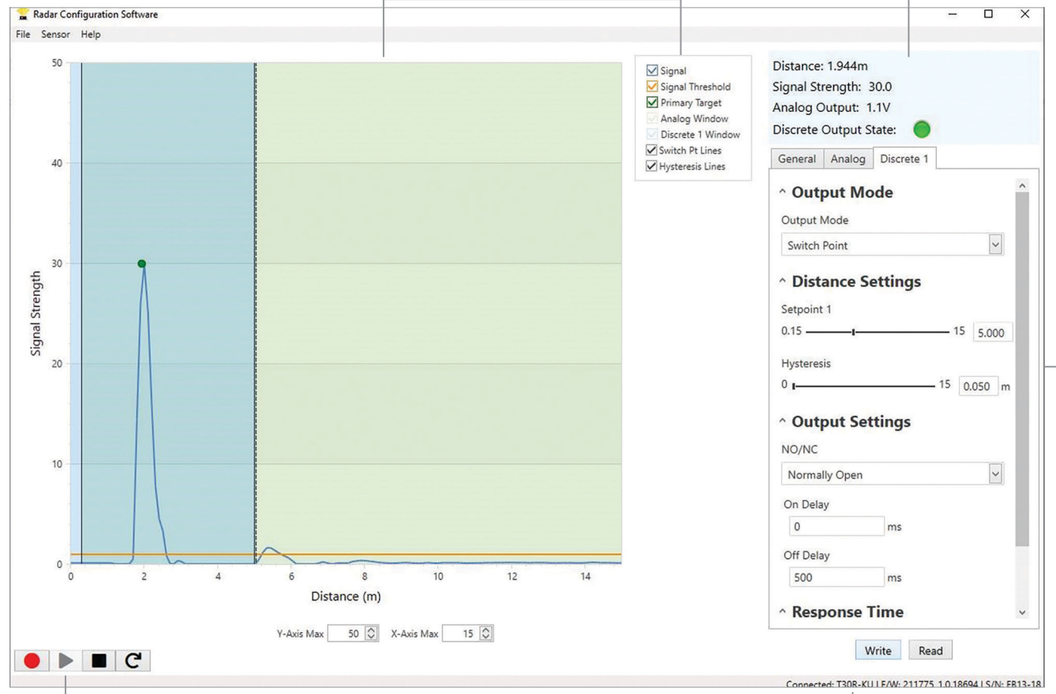
Connect to the sensor, save or load a configuration, or reset to factory defaults

Live Sensor Data and Legend

Signal strength versus distance, select options to display data on the graph

Summary pane

Displays the distance to the target, the signal strength, and the output status



Live Sensor Data Controls

Record, freeze, and play real-time sensor data

Status Bar

Shows that the sensor is connected, a software update is available, and if the sensor data is being recorded to a file

Sensor Settings

Set the sensor parameters

Q90R and Q90R2 Series

Powerful Detection and Measurement in Nearly Any Environment

- Robust design for superior and consistent operation in any environment
- Versatility to outperform optical and ultrasonic technologies in demanding conditions
- Intuitive interface enables simple integration and streamlines troubleshooting
- Enhance equipment performance with advanced configuration and detection

Q90R Models

Beam Pattern	Operating Frequency	Communication	Output	Model
40° x 40°	60 GHz	IO-Link	Dual discrete	**Q90R-4040-6KDQ**
			4-20 mA analog	**Q90R-4040-6KIQ**
			0-10 V analog	**Q90R-4040-6KUQ**

Q90R2 Model

Beam Pattern	Operating Frequency	Communication	Output	Model
120° x 40°	60 GHz	IO-Link	Dual discrete	**Q90R2-12040-6KDQ**

Accessories

SMBAMSQ90R
adjustable mounting bracket

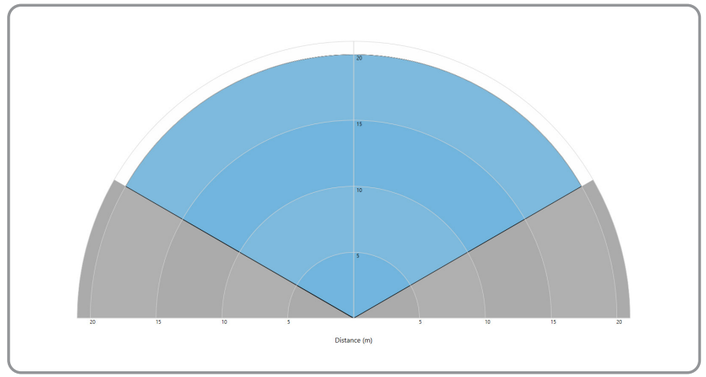
SMBRAQ90R
right angle mounting bracket

DXMR90-4K
IO-Link master

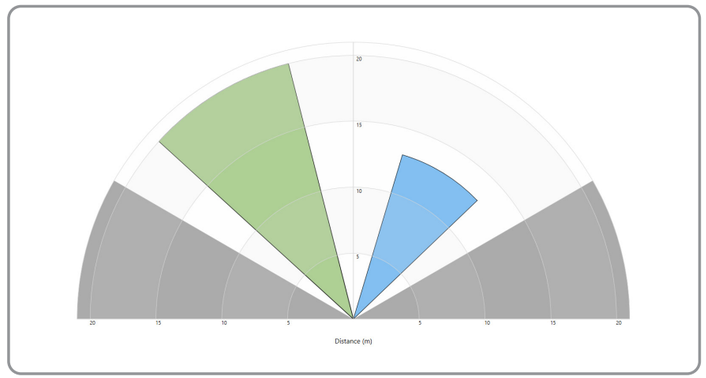
PRO-KIT
Required for PC configuration

Banner Measurement Sensor Software

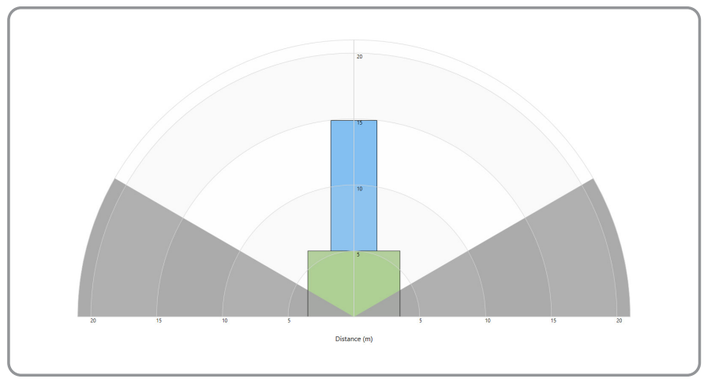
Q90R2 offers enhanced configuration and multi-dimensional detection for application flexibility



Feedback on targets includes radial distance, angular position, and target velocity, which are all useful for complex applications in difficult environments



The 120° x 40° field of view is highly configurable and enables precision positioning and control



Customize advanced parameters such as window shape and target setpoints to each application

T30R Series

Bridges the Gap Between Radar and Ultrasonics

- Operates at 122 GHz with two independent, adjustable sensing zones, which enables higher-precision measurements with a narrow or wide beam pattern up to 15 meters away
- Compact, rugged IP67-rated housing for operation in harsh environments
- Detects a wider range of targets than traditional 24 GHz radar, including high-dielectric materials like metal and lower-dielectric materials like wood, rock, or organic material
- Dual discrete outputs for slow and stop positions or analog and IO-Link for absolute measurement values
- Radar configuration software, IO-Link, remote teach, and push buttons for flexible setup
- Pulse Pro output to connect to a Banner light for direct visual feedback with no external controller

Beam Pattern	Linearity	Detection Range	Telecom Approval	Output	Model
15° x 15°	< ±20 mm at < 500 mm < ±4 mm > 500 mm	0.15–15 m	US, Europe, UK, Australia/ New Zealand, Malaysia	2 Discrete (NPN/PNP configurable) with IO-Link and Pulse Pro	**T30R-1515-KDQ**
				1 Analog (4–20 mA) 1 Selectable Discrete (PNP/NPN) with IO-Link	**T30R-1515-KIQ**
				1 Analog (0–10 V) 1 Selectable Discrete (PNP/NPN) with IO-Link	**T30R-1515-KUQ**
15° x 15°	< ±4 mm	0.1–6 m	US	2 Discrete (NPN/PNP configurable) with IO-Link and Pulse Pro	**T30R-1515-CKDQ**
				1 Analog (4–20 mA) 1 Selectable Discrete (PNP/NPN) with IO-Link	**T30R-1515-CKIQ**
				1 Analog (0–10 V) 1 Selectable Discrete (PNP/NPN) with IO-Link	**T30R-1515-CKUQ**
15° x 15°	< ±20 mm at < 500 mm < ±4 mm > 500 mm	0.15–25 m	US, Europe, UK, Australia/ New Zealand, Malaysia	2 Discrete (NPN/PNP configurable) with IO-Link and Pulse Pro	**T30R-1515-LKDQ**
				1 Analog (4–20 mA) 1 Selectable Discrete (PNP/NPN) with IO-Link	**T30R-1515-LKID**
				1 Analog (0–10 V) 1 Selectable Discrete (PNP/NPN) with IO-Link	**T30R-1515-LKUQ**
45° x 45°	< ±20 mm at < 500 mm < ±4 mm > 500 mm	0.3–10 m	US, Europe, UK, Australia/ New Zealand, Malaysia	2 Discrete (NPN/PNP configurable) with IO-Link and Pulse Pro	**T30R-4545-KDQ**
				1 Analog (4–20 mA) 1 Selectable Discrete (PNP/NPN) with IO-Link	**T30R-4545-KIQ**
				1 Analog (0–10 V) 1 Selectable Discrete (PNP/NPN) with IO-Link	**T30R-4545-KUQ**

To order the pigtail QD model, add a "P" to the end of the model number (e.g., T30R-1515-KDQP)

Accessories

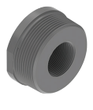
SMB30A
right-angle bracket

SMB30MM
right-angle bracket with curved mounting slots

SMB30SC
split clamp with swivel bracket

SMB30FA
swivel bracket with tilt and pan movement

SMBT30RTM
tank mounting bracket



SAFT30R-PVC-G2
M30 to 2 in. NPT adapter

PRO-KIT
Required for PC configuration

T30RW Series

Detection and measurement in the harshest environments

- All the benefits of the standard T30R sensor in a more resilient housing
- Compact, robust IP67, IP69K housing
- Polypropylene sleeve on the barrel provides ample chemical resistance
- Radar configuration software, IO-Link, and remote teach for flexible setup
- Pulse Pro output to connect to a Banner light for direct visual feedback with no external controller
- Common tank connection size for simplified installation

Beam Pattern	Barrel Thread Type	Detection Range	Telecom Approval	Output	Model
15° x 15°	M40	15 m	US, Europe, UK, Australia/ New Zealand, Malaysia	2 Discrete (NPN/PNP configurable) with IO-Link and Pulse Pro	**T30RW-1515-KDQ-M40**
				1 Analog (4–20 mA) 1 Selectable Discrete (PNP/NPN) with IO-Link	**T30RW-1515-KIQ-M40**
				1 Analog (0–10 V) 1 Selectable Discrete (PNP/NPN) with IO-Link	**T30RW-1515-KUQ-M40**

Accessories

SMB40A
right-angle bracket

SMBAMS40P
flat bracket

PRO-KIT
Required for PC configuration

K50R Series

Reliable, Cost-Efficient Sensing for Challenging Environments

- For detection and measurement of moving and stationary targets
- Self contained, all-in-one solution
- Bright, visible indication; available in Pro models with configurable LEDs
- Easy setup and configuration of range, sensitivity, and output using the Banner Radar Configuration Software
- Compact, rugged IP67-rated housing withstands harsh environments
- Performance modes to customize the sensor to the application

Beam Pattern	Housing	Range	Type	Telecom Approval	Output	Model
80° x 60°	Flush mount	100 mm–3 m	Standard	US, Europe, UK, Canada, Australia/ New Zealand	Dual discrete	**K50RF-8060-LDQ**
			Pro with Configurable LEDs			**K50RPF-8060-LDQ**
40° x 30°		50 mm–5 m	Standard			**K50RF-4030-LDQ**
					4–20 mA analog	**K50RF-4030-LIQ**
					0–10 V analog	**K50RF-4030-LUQ**
			Pro with Configurable LEDs		Dual discrete	**K50RPF-4030-LDQ**
	Base mount		Standard		Dual discrete	**K50RB-4030-LDQ**
					4–20 mA analog	**K50RB-4030-LIQ**
					0–10 V analog	**K50RB-4030-LUQ**
			Pro with Configurable LEDs		Dual discrete	**K50RPB-4030-LDQ**

Accessories

SMB30A
Right-angle mounting bracket

SMBK50RA
Right-angle mounting bracket

SMBAMSK50R
Adjustable mounting bracket

MQDC-506-USB
pro converter cable

Q130RA Series

PC GUI Configurable, Narrow and Wide Beam Sensor

- One adjustable sensing zone to reliably detect moving or stationary objects up to 40 meters away
- Simple setup and precise control with intuitive graphical user interface
- Unaffected by ambient weather, including rain, snow, fog, sunlight, and temperatures from -40 to 65° C
- Rugged IP67-rated housing for dependable long-term operation in harsh environments

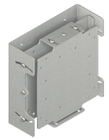
Beam Pattern	Range	Telecom Approval	Output	Model
90° x 76°	24 m	US, Europe, UK, Canada, China, Australia/New Zealand, Brazil	Bipolar NPN/PNP N.O./N.C. Configurable	**Q130RA-9076-AFQ**
24° x 50°	40 m	US, Europe, UK, China, Australia/ New Zealand, Brazil		**Q130RA-2450-AFQ**

Accessories

SMBWSQ120
rear-mount rain cover

SMBQ240SS1
bracket for ±20° of tilt on one axis

SMBQ240SS2
bracket for ±20° of tilt on second axis



SMBQ240SS3
bracket for ±20° of tilt in all directions

Q130WS
hydrophobic coated rain cover

MQDC-506-USB
pro converter cable

Q240RA Series

Narrowest Beam, Longest Range Sensor

- Reliably detect moving or stationary objects within a narrow beam pattern up to 100 meters away
- Two independent, adjustable sensing zones
- Narrow 11° × 13° beam pattern
- Rugged IP67-rated housing withstands harsh environments

Range	Output	Telecom Approval	Model
40 m	2 Discrete (NPN/PNP configurable)	US, UK, Canada, Brazil, Mexico, Taiwan	**Q240RA-US-AF2Q**
		US, Europe, UK, Australia/New Zealand, Brazil, Japan, Singapore, South Korea	**Q240RA-EU-AF2Q**
		China	**Q240RA-CN-AF2Q**
100 m	2 Discrete (NPN/PNP configurable)	US, UK, Canada, Brazil, Mexico, Taiwan	**Q240RA-US-AF2LQ**
		US, UK, Europe, Australia/New Zealand, Brazil, Japan, Singapore, South Korea	**Q240RA-EU-AF2LQ**
		China	**Q240RA-CN-AF2LQ**
100 m	1 Analog (0–10 V) and 1 Selectable NPN/PNP	US, UK, Canada, Brazil, Mexico, Taiwan	**Q240RA-US-ULQ**
100 m	1 Analog (4–20 mA) and 1 Selectable NPN/PNP	US, UK, Canada, Brazil, Mexico, Taiwan	**Q240RA-US-ILQ**
		US, Europe, UK, Australia/New Zealand, Brazil, Japan, Singapore, South Korea	**Q240RA-EU-ILQ**

Accessories

SMBQ240SS1
bracket for ±20° of tilt on one axis

SMBQ240SS2
bracket for ±20° of tilt on second axis

SMBQ240SS3
bracket for ±20° of tilt in all directions

Q240WS
hydrophobic coated rain cover

QT50R Series

QT50R Series sensors are available in both adjustable-field models, which can use diffuse sensing to detect an object, or in retroreflective models, which use a reference signal retroreflective target, floor, wall, or other stationary object) for reliable detection of weak objects.

QT50R-AF

Widest Beam, Small Package

- Detects objects up to 24 m away
- Analog and discrete outputs available
- One or two independent, adjustable sensing zones
- Total beam pattern 90° (± 45) x 76° (± 38)
- Rugged IP67-rated housing withstands harsh environments

QT50R-RH

Robust Retroreflective Sensing Mode

- Detects objects up to 12 m away
- Effective beam equals size of retro target
- Ignores objects in the background beyond the retroreflective target
- Rugged IP67-rated housing withstands harsh environments

Range	Sensing Mode	Output	Telecom Approval	Model
24 m	Adjustable-field	Bipolar NPN/PNP	US, UK, Canada, and Brazil	**QT50R-US-AFHQ**
			US, Europe, UK, Australia/New Zealand, Japan, China	**QT50R-EU-AFHQ**
			South Korea*	**QT50R-KR-AFHQ**
			Taiwan	**QT50R-TW-AFHQ**
24 m	Adjustable-field	2x Bipolar NPN/PNP	US, UK, Canada, and Brazil	**QT50R-US-AF2Q**
			US, Europe, UK, Australia/New Zealand, Japan, China	**QT50R-EU-AF2Q**
			Taiwan	**QT50R-TW-AF2Q**
24 m	Adjustable-field	2x Selectable NPN/PNP and 0–10 V analog	US, Europe, UK, Australia/New Zealand	**QT50R-EU-AF2UQP**
3.5 m	Adjustable-field	Bipolar NPN/PNP	US, Europe, UK, Australia/New Zealand, Japan, China	**QT50R-EU-AFSQ**
0 to 12 m	Retroreflective	Bipolar NPN/PNP	US, UK, Canada, and Brazil	**QT50R-US-RHQ**
			US, Europe, UK, Australia/New Zealand, Japan, China	**QT50R-EU-RHQ**

For five-wire 2 m integral cable versions, remove suffix Q from the model number (e.g., QT50R-EU-AFH)

* Models for South Korea: 12 to 24 V dc

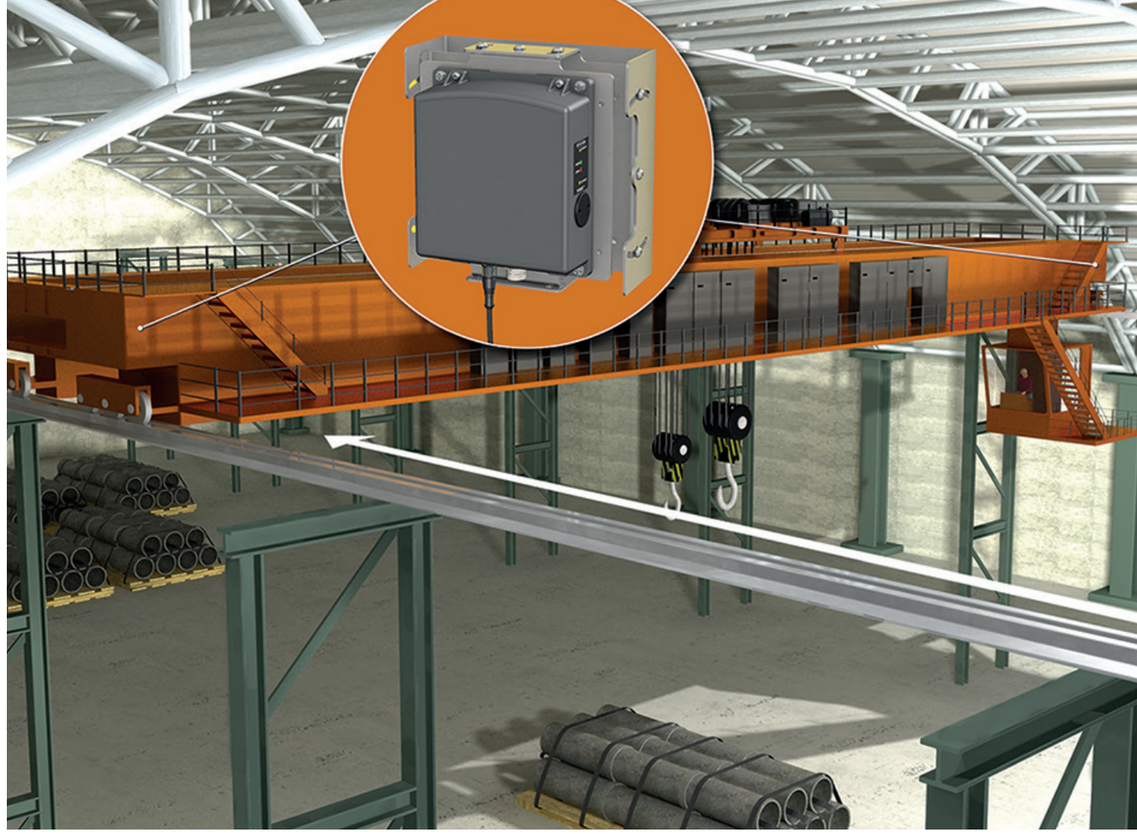
Accessories

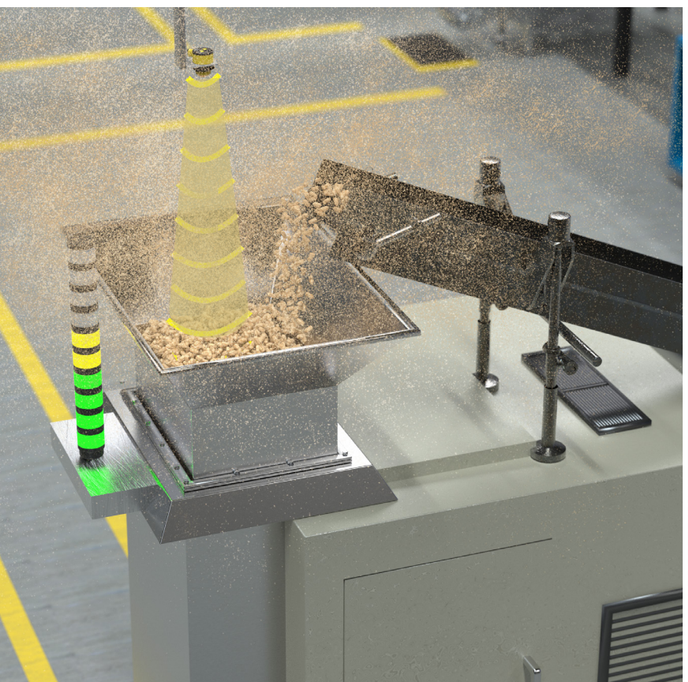
QT50RCK
weather deflector

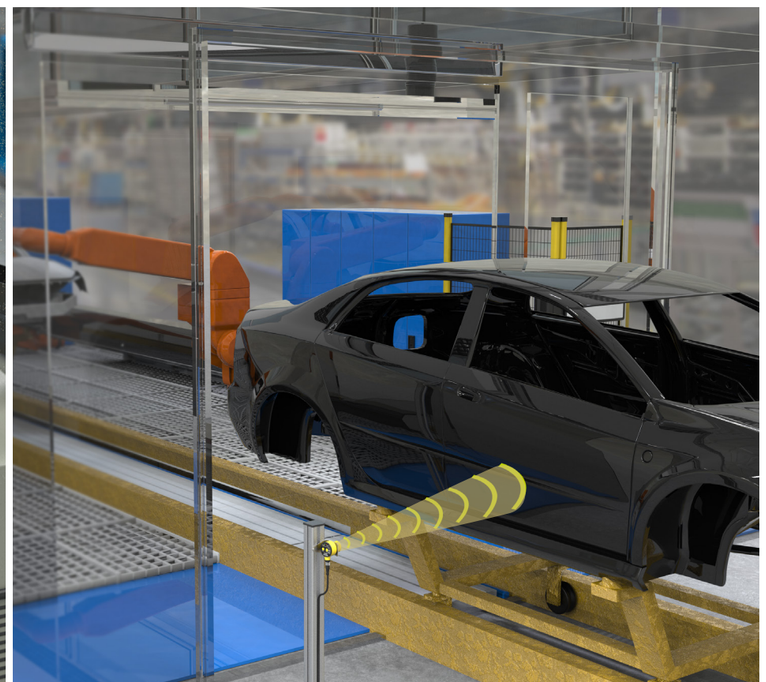
SMB30SC
split clamp bracket with swivel

SMB30MM
right-angle bracket with curved mounting slots

QT50RWS
hydrophobic coated rain cover







Smarter Automation. Better Solutions.

Banner Engineering designs and manufactures industrial automation products including sensors, smart IIoT and industrial wireless technologies, LED lights and indicators, measurement devices, machine safety equipment, as well as barcode scanners and machine vision. These solutions help make many of the things we use every day, from food and medicine to cars and electronics. A high-quality, reliable Banner product is installed somewhere around the world every two seconds. Headquartered in Minneapolis since 1966, Banner is an industry leader with more than 10,000 products, operations on five continents, and a world-wide team of more than 5,500 employees and partners. Our dedication to innovation and personable service makes Banner a trusted source of smart automation technologies to customers around the globe.

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