Port Equipment Sensing Solutions

BANNER®
more sensors, more solutions
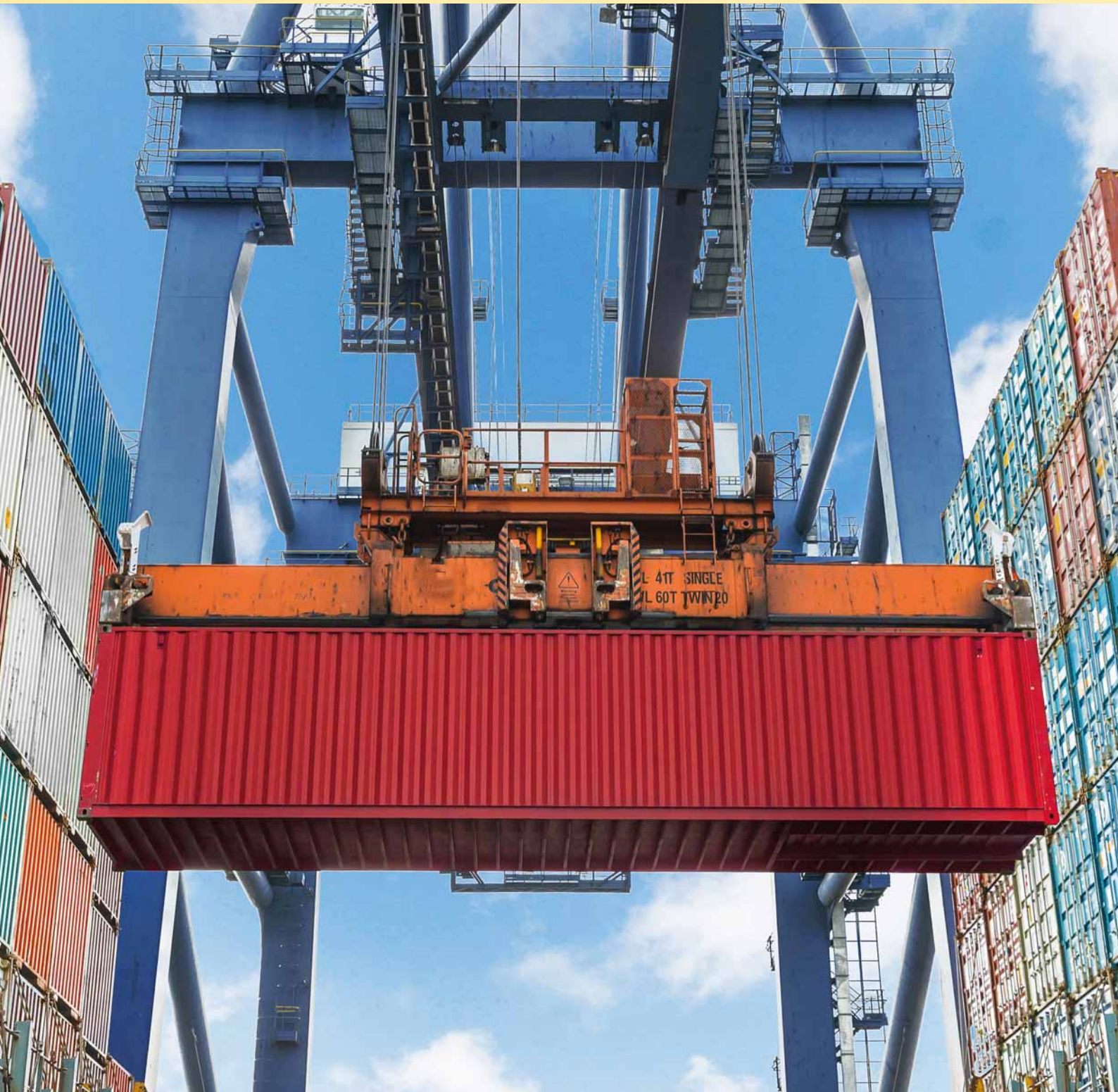
Radar Sensors for Crane Collision Avoidance

Harbor cranes such as STS, RTG, RMG are a large investment and if damaged, require costly repair or replacement. Banner Engineering's R-GAGE radar-based sensor is the perfect rugged solution for crane-to-crane, or crane-to-obstacle collision avoidance applications. Radar sensors can operate in harsh outdoor conditions. Sensing functions are unaffected by wind, rain or snow, fog, sunlight, humidity and fluctuating air temperatures.

Radar sensors use Frequency Modulated Continuous Wave (FMCW) technology to reliably detect moving or stationary targets, including cranes, cars, trains, trucks and cargo in extreme weather conditions. They operate at 24 GHz in the Industrial, Scientific and Medical (ISM) telecommunication band.

R-GAGE sensors allow for easy configuration by using DIP switches; there is no PC required for setup nor installation. The adjustable sensing field ignores objects beyond the setpoint. Sensing distance, sensitivity and output configuration are adjustable.

Adjustable-field radar-based sensor, 12 to 30 VDC, IP67

Model*	Range	Sensing Zones	Beam Angle	Connection
QT50R-..-AFHQ	Up to 15 m	Single zone, adjustable	90 x 90°	5 pin M12
Q120RA-..-AF2Q	Up to 40 m	2 independent zones, adjustable	20 x 50°	5-pin M12
Q240RA-..-AF2Q	Up to 40 m	2 independent zones, adjustable	11 x 13°	5-pin M12

* Region specific models available – visit www.bannerengineering.com or call factory
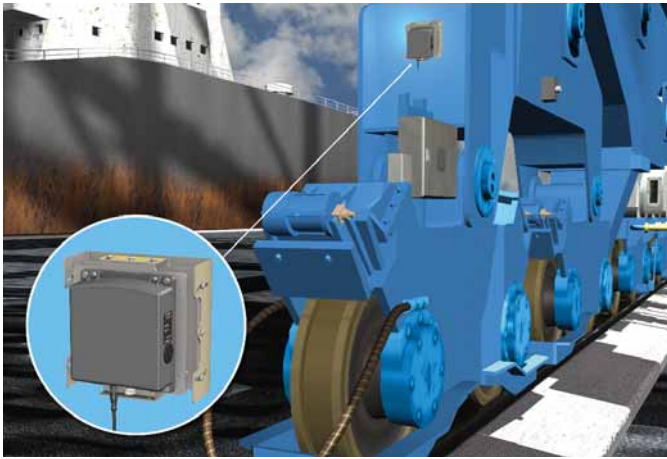
Accessories	
QT50RCK	Rain cover for QT50R
SMBWSQ120	Rain cover for Q120RA
Q240WS	Rain cover for Q240RA

Mounting Brackets (for Q120 and Q240)	
SMBQ240SS1	2-piece bracket, provides ±20° of tilt on one axis
SMBQ240SS2	Bracket, provides ±20° of tilt on two axes
SMBQ240SS3	Full bracket assembly, ±20° of tilt in all directions (SS1 + SS2)

STS Collision Avoidance

Radar sensing with dual detection zones with a range up to 40 m allows to slow down or stop cranes on rails.

RTG Collision Avoidance

The dual detection zones allow high speed gantry cranes to slow down or stop when approaching an obstacle.

Crane-to-Crane Collision Avoidance

Radar sensors can reliably detect the presence of another crane or obstacle and activate stop or warning signals.

Back Drive Sensor

Driver aid sensor to detect obstacles at the back side where the visibility is limited.

Truck Detection

Radar sensors act as a trigger to activate cameras to capture container ID markings.

Train Detection

Radar sensors detect container trains to activate RFID antennas or Gamma Ray Gates.

Industrial Wireless I/O Solutions

Topologies

Point-to-Point: direct I/O mapping; no software required; up to 32 pairs in the same location

Star Topology: expandable network with one Gateway supporting up to 47 Nodes

Tree Topology (Mesh): Host-controlled network with built-in repeater architecture, up to 50 slaves per network master

Features

Proprietary protocol with built-in signal strength, FHSS communication

Multiple power possibilities including solar panel or battery options

I/O options: 0–20 mA; 0–10 VDC; PNP-NPN; Counter; Thermistor; RTD; PT100; Bridge; RS-485; RS-232, Class 1/Div 1 ATEX…

DX80PM Premapped Kit – 1x Gateway and 1x Node, 12-24 VDC, ±10%

Mixed discrete and analog I/O Kit*		IP Rating	Discrete I/O		Analog I/O	
			IN	OUT	IN	OUT
DX80K.M6-PM2	1x GW: DX80G.M6S-PM2 1x Node: DX80N.X6S-PM2	IP67	4x PNP-NPN (selectable)	4x PNP	2x 0-20 mA	2x 0-20 mA
Discrete I/O only Kit*		IP Rating	IN	OUT	IN	OUT
DX80K.M6-PM8	1x GW: DX80G.M6S-PM8 1x Node: DX80N.X6S-PM8	IP67	6x PNP	6x PNP	/	/

* All wireless products are available in 900 MHz and 2.4 GHz frequencies for operation in the ISM bands worldwide.

GPS Module – Vibration Sensor – Nodes with Serial Interface

Model	IP Rating	Power	Description
GPS50M	IP69K	5–30 VDC	Modbus protocol on RS-485 serial; latitude, longitude, altitude (meters), time, and date in signed integer and floating point formats
QM42VT2	IP67	3.6-5.5 VDC or 10-24 VDC	Vibration and temperature sensor Modbus version
QM42VT1*	IP67	3.6-5.5 VDC	Vibration and temperature sensor via 1-wire serial interface
DX80N.Q45VT*	IP67	2x 3.6 VDC	Q45 Vibration/Temperature Node with integrated batteries

*QM42VT1 sensor requires DX80N.Q45VT node

DXM100 Wireless Controller
Preconfigured as a Modbus RTU to EtherNet/IP protocol converter
RS-232, RS-485 and Ethernet Communication Ports; USB Configuration Port

Model	Power	Topology	IP Rating	Discrete I/O		Analogue I/O	
				IN	OUT	IN	OUT (DAC)
DXM100-B1R1	12-30 VDC, 12 VDC solar panel or 12 V battery	DX80 Radio	IP20	PNP-NPN	NMOS	4–20 mA, 0–10 V, Counter, Temperature 10 kΩ Thermistor	0-20 mA or 0-10 VDC
DXM100-B1R2	12-30 VDC, 12 VDC solar panel or 12 V battery	MultiHop Radio	IP20	PNP-NPN	NMOS	4–20 mA, 0–10 V, Counter, Temperature 10 kΩ Thermistor	0-20 mA or 0-10 VDC

Typical Industrial Applications for Wireless I/O

Truck Traffic Management
Wireless M-GAGE automatically detects the trucks and alerts operators of traffic and/or arrival of the trucks.

Crane-to-Crane Communication
Transmit distance and position data between cranes so multiple cranes for close proximity operation.

Four Load Cells on Spreader
Load cells and twist locks status information needed for stable lifting operations.
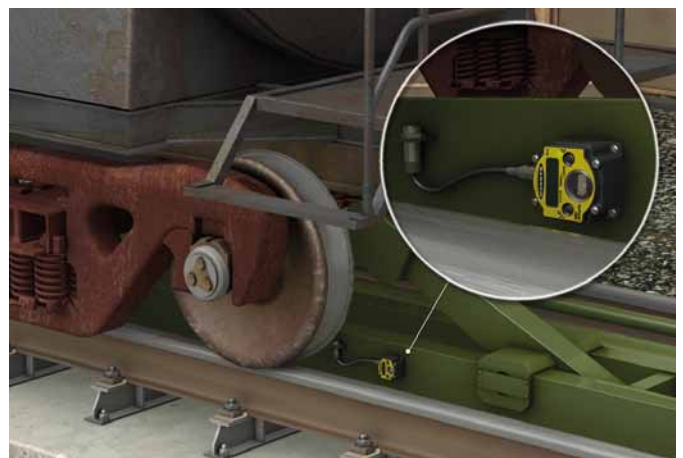

Load Cell – Hook to Cabin
Wireless I/O communication between the hook and the cabin with a long-lasting, battery-powered solution.

Vibration Monitoring for Predictive Maintenance
By monitoring increases in vibration, problems can be detected before they result in unplanned down time.

Monitoring Railcars Wirelessly
A railcar wheel monitoring system detects the railcar wheels and triggers an axle pushing arm.

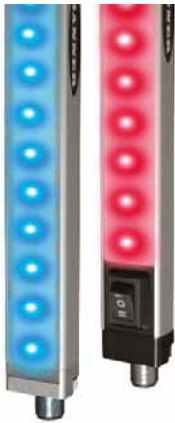# Illumination & Indication Solutions

TL50 Beacon Tower Lights

- Highly visible indication for indoor or outdoor applications
- Compact, stylish design with rotating and flashing options
- Models available with rugged, water-resistant IP67 housing including omni-directional alarm option

K50 Beacon Omni-Directional Indicators

- High intensity with continuous, strobing and rotating light options
- Rugged, sealed housing rated to IP69K for outdoor and high-pressure washdown use
- Models for DC and AC operation

WLS28-2 LED Strip Lights

- Available in IP50 (indoor) or IP67/IP69K (outdoor) models
- Ability to dim lights using wiring, built-in switch or external PWM signal
- Single and dual colour models available, ideal for day/night vision applications

WLS27 LED Strip Lights

- IP67/IP68g/IP69K rated, ideal for outdoor use
- High/Low/Off external control or 0-100% dimmable (PWM signal)
- Single and dual colour models available, ideal for day/night vision applications

WLB32 LED Light Bar

- Robust metal housing, shatterproof light cover IP50 rated (dry location only)
- Ideal for work stations, machine lighting, control cabinets and manufacturing lines
- High/Low/Off switch allows users to customize light levels

Illuminated E-Stops (IEC/EN 60204-1)

- Easy installation and hookup with no assembly, using standard M12 cordsets for error free cabling
- Illuminated bases will guide operators to the nearest E-Stop in poor lighting conditions: once activated it will flash to easily define which button has been pushed

TL70 Tower Lights (standard and wireless)

- Select up to five highly-visible colour light segments per device with optional audible available
- Indicator segments appear gray when off, eliminating false indication from ambient light
- Base unit can be equipped with two way wireless communication, to eliminate costly and time-consuming wiring runs

QS30EX/RX Long-Range Sensors

- High performance and long range optical sensors
- Universal mounting
- IP67 rated and sunlight immune for use in harsh environments

T30UX & QT50U Long-Range Ultrasonic Sensors

- The QT50U has a completely sealed, shock-resistant housing with an extended sensing range up to 8 m
- The T30UX has a 30 mm threaded barrel and sensing ranges up to 3 m

LTF Time-of-Flight Laser Sensors

- LTF series uses advanced "time-of-flight" technology for precise, long-distance gauging
- Reliably detects targets regardless of angles
- Visible red laser spot for easy alignment
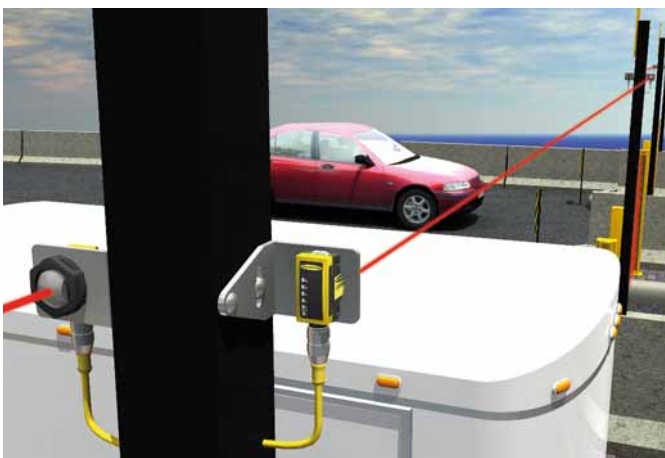
Typical Applications

Beacon Light on Spreader
The beacon light indicates the status of the ship-to-shore crane spreader to the operator cabin.

Reach Stacker
Intensely bright beacon status lights are highly visible in daylight and dimmable for night-time operation.

Straddle Carrier Positioning
QS30EX/RX high power sensor pairs are mounted on a STS crane to accurately position the straddle carrier.

Electrical Cabinet Lighting
Rugged work area lights can be equipped with motion sensor for automatic operation.

Additional Resources
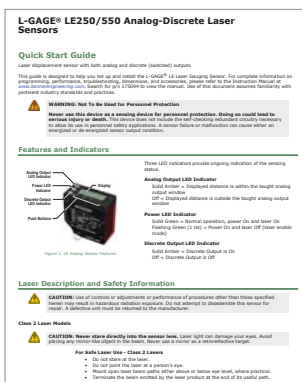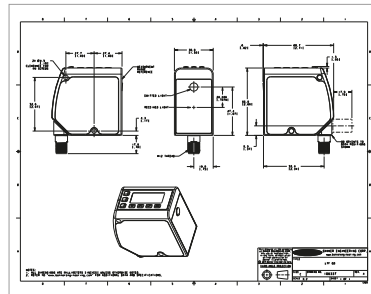

Complete Catalogue

Video Channel

Web Site

Data Sheets

CAD, STP, DXF or PDF drawings

More Sensors, More Solutions

Machine Safety

Sensors

Vision

Lighting & Indication

Wireless I/O