Wireless I/O Solutions

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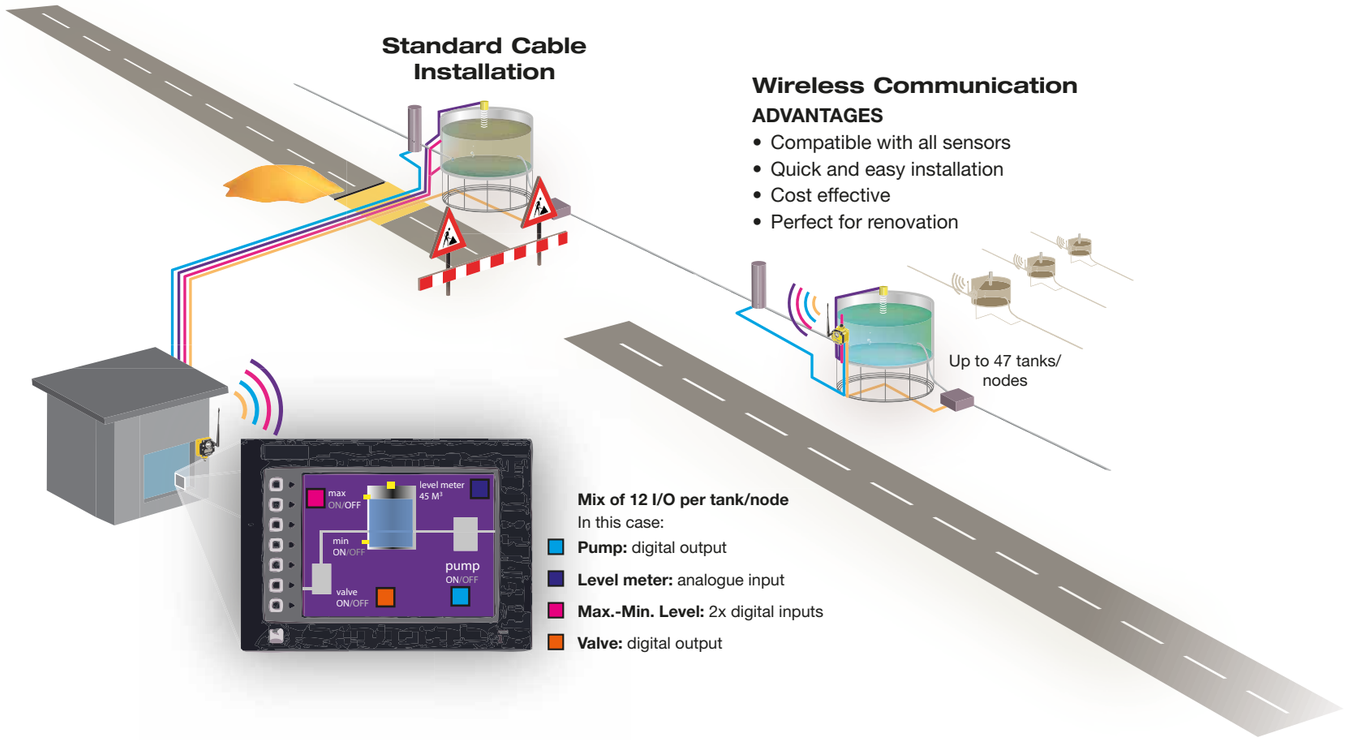
more sensors, more solutions

Wireless I/O Solutions

Cable Replacement: Tank Level Monitoring Example



Key Features

Reliable

Frequency Hopping

Repeater Network

Built-in Signal strength for Site Survey

Secure

Proprietary Protocol

Link Loss Output Fall Back Condition

Multiple Network ID

Flexible

Bidirectional Communication

Configurable and Mapped I/O

Various Power Possibilities

Industrial

Multiple Signals Digital and Analogue

10011011

Serial & Ethernet Protocols

Industrial IP67 Housing

Network Topologies

Point to Point Topology

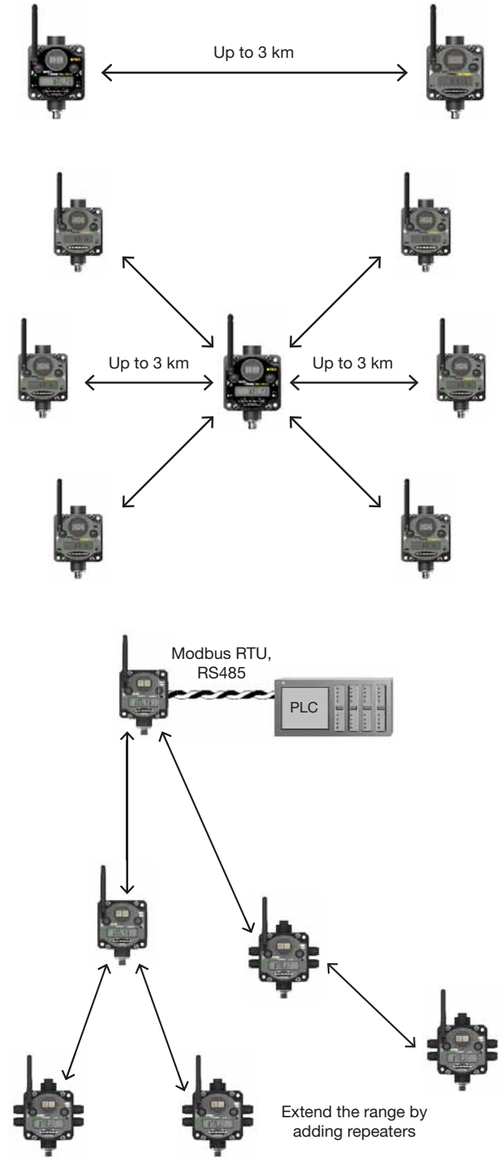
- Direct I/O mapping; no software required
- Digital and analogue I/O available on each device
- Up to 32 pairs in the same location
- Integrated LEDs provide real-time RF link indication
- 10-30 VDC

Star Topology

- Gateways offer I/O and serial communication output (Modbus RTU or Ethernet available)
- Free software offers simple user configuration and I/O mapping
- Digital, analogue, temperature and counter inputs available at the Node
- Up to 47 Nodes per Network/Gateway
- Multiple networks in the same location
- 10-30 VDC, solar panel or battery option

Tree Topology

- Host Controlled network with repeater architecture built-in
- Every radio can be set up as a master, repeater or slave through integrated DIP switches
- Digital, analogue, temperature, counter and more I/O options available on each device
- Up to 50 slaves per network master
- Unlimited networks in the same location
- 10-30 VDC, solar panel or battery option



Choose your wireless device										
Network Architecture	Functionality	Topology			I/O and Communications					Board Level Available
	Premapped (PM)	Point to Point	Star	Tree	I/O	RS232	RS485	Modbus RTU	Ethernet	
Wireless Q45	✔	✔	✔		✔					✔
DX80PM	✔	✔	✔		✔			Gateway		
DX80		✔	✔		✔			Gateway		✔
Data Radio		✔	✔	✔	✔	✔	✔	✔		✔
Serial Radio		✔	✔	✔		✔	✔			
Ethernet Radio		✔	✔	✔		✔	✔		✔	

sure cross Wireless I/O

DX80PM

Premapped

DX80PM Premapped 2.4 GHz Gateway and Node, 10-30 VDC

Mixed discrete and analogue I/O		Discrete I/O		Analogue I/O	
		IN	OUT	IN	OUT
DX80G2M6S-PM2	Gateway	4x PNP-NPN	4x PNP	2x 0-20 mA	2x 0-20 mA
DX80N2X6S-PM2	Node				
Discrete I/O only		**IN**	**OUT**	**IN**	**OUT**
DX80G2M6S-PM8	Gateway	6x PNP-NPN	6x PNP	/	/
DX80N2X6S-PM8*	Node				

* Models ending in "**L**" have no LCD, e.g. **DX80N2X6S-PM8L**

DX80

Star Topology

DX80 2.4 GHz Gateways with Modbus RTU (RS485) communication, and Nodes

Gateway	Power	Discrete I/O		Analogue I/O	
		IN	OUT	IN	OUT
DX80G2M6S-PB2	10-30 VDC PCB	2x PNP	2x PNP	2x 0-20 mA	2x 0-20 mA
DX80G2M6S-P8	10-30 VDC	12x PNP (I+O = 12 max)	12x PNP (I+O = 12 max)	/	/
DX80G2M6S-P2	10-30 VDC	4x PNP-NPN	4x PNP	2x 0-20 mA or 0-10 VDC	2x 0-20 mA
DX80G2M6S0P0M4M4	10-30 VDC	/	/	4x 0-20 mA	4x 0-20 mA
DX80G2M2S-P	FlexPower	/	/	/	/
DX80P2T6S-P	10-30 VDC	GatewayPro with Modbus TCP & Ethernet IP communication (no I/O)			
Node	**Power**	**Discrete I/O**		**Analogue I/O**	
		IN	OUT	IN	OUT
DX80N2X6S-PB2	10-30 VDC PCB	2x PNP	2x PNP	2x 0-20 mA	2x 0-20 mA
DX80N2X2S-P7	FlexPower	12x NPN (I+O = 12 max)	12x NMOS (I+O = 12 max)	/	/
DX80N2X6S-P8	10-30 VDC	12x PNP (I+O = 12 max)	12x PNP (I+O = 12 max)	/	/
DX80N2X6S-P2	10-30 VDC	4x PNP-NPN	4x PNP	2x 0-20 mA or 0-10 VDC	2x 0-20 mA
DX80N2X6S0P0M4M4	10-30 VDC	/	/	4x 0-20 mA	4x 0-20 mA
DX80N2X2S-P5	FlexPower	2x NPN	2x NMOS	4x 0-20 mA or 0-10 VDC	/
DX80N2X2S-P3	FlexPower	2x PNP-NPN	1x NMOS	4x Thermocouple 1x Thermistor	/
DX80N2X2S4A2	FlexPower	2x PNP-NPN	2x NMOS	2x Selectable counter	/
DX80N2X1S2A1	Internal Battery	1x PNP-NPN	1x NMOS	1x Selectable counter	/
DX80N2X2S2S	FlexPower	Serial interface for up to 2 serial sensing devices			
DX80N2X1S1S	Internal Battery	Serial interface for 1 serial sensing device			

FlexPower = 10-30 VDC or 3.6-5.5 VDC for battery

Data Radio

Modbus Data Radio without & with I/O

Data Radio MultiHop 2.4 GHz with Modbus, can be set up as Master, Slave or Repeater

Model	Power	Discrete I/O		Analogue I/O		Serial Interface
		IN	OUT	IN	OUT	
DX80DR2M-H	FlexPower	Modbus RS485/RS232 (no I/O)				
DX80DR2M-H1	FlexPower	4x NPN	2x NMOS	2x 0-20 mA, 1x Thermistor, 1x Counter	/	RS485
DX80DR2M-H2	10-30 VDC	4x PNP	4x PNP	2x 0-20 mA	2x 0-20 mA	RS485
DX80DR2M-H3	FlexPower	2x NPN	2x NMOS	4x Thermocouple, 1x Thermistor	/	RS232
DX80DR2M-H4	FlexPower	/	/	4x 3-wire PT100 RTD	/	RS232
DX80DR2M-H5	FlexPower	4x NPN	2x NMOS	4x 0-20 mA	/	RS485
DX80DR2M-H12	FlexPower	2x NPN	2x NMOS	2x 0-20 mA, 1x Thermistor, 2x SDI-12 or 1x Counter	/	RS485
DX80DR2M-HB1	FlexPower PCB	2x NPN	2x NMOS	2x 0-20 mA	/	RS485
DX80DR2M-HB2	10-30 VDC PCB	2x PNP	2x PNP	2x 0-20 mA	2x 0-20 mA	RS485

FlexPower = 10-30 VDC or 3.6-5.5 VDC for battery

Ethernet Data Radio

To create wireless Ethernet networks

Data Radio MultiHop 2.4 GHz with Ethernet, can be set up as Master, Slave or Repeater

Model	Power	Discrete I/O		Analogue I/O	
		IN	OUT	IN	OUT
DX80ER2M-H	FlexPower	10/100 base-T Ethernet RJ45 connection			

FlexPower = 10-30 VDC or 3.6-5.5 VDC for battery

Serial Data Radio

To extend the range of a serial communication network

Data Radio 2.4 GHz with serial communication (RS232 or RS485), can be set up as Master, Slave or Repeater

Model	Power	Discrete I/O		Analogue I/O	
		IN	OUT	IN	OUT
DX80SR2M-H	10-30 VDC	Serial communication RS232 or RS485 (no I/O)			

DX99

Intrinsically Safe Nodes

DX99 2.4 GHz Nodes for Hazardous Locations, ATEX Zone 0 & 20, compatible with DX80 Gateways out of Ex Area					
Model	**Discrete IN**	**Modbus IN**	**Analogue IN**	**Power (18 V boost)**	**Housing**
DX99N2X1S2N0M2X0D2	2x PNP-NPN	/	2x 0-20 mA	Internal Battery	Metal
DX99N2X2S2N0M2X0A2	2x PNP-NPN	/	2x 0-20 mA	DX81H battery box	Polycarbonate
DX99N2X1S2N0T4X0D0	2x PNP-NPN	/	3x Thermocouple, 1x Thermistor	Internal Battery	Metal
DX99N2X2S2N0T4X0A0	2x PNP-NPN	/	3x Thermocouple, 1x Thermistor	DX81H battery box	Polycarbonate
DX99N2X1S0N0R4X0D0	/	/	4x 3-wire PT100 RTD	Internal Battery	Metal
DX99N2X2S0N0R4X0A0	/	/	4x 3-wire PT100 RTD	DX81H battery box	Polycarbonate
DX99N2X1S1S0V2X0D4	1x NPN	1x RS485	1x 0-5 VDC or 1x 0-10 VDC	Internal Battery	Metal
DX99N2X1S1N0M3X0D5	1x NPN	/	1x 0-20 mA (29 s warm-up time) or 2x 0-20 mA, 1x 3-wire RTD (standard warm-up)	Internal Battery	Metal

DX85

Extension I/O

DX85 Remote I/O Extension Unit (only for Gateways with Modbus RTU Communication)				
Model	**Discrete I/O**		**Analogue I/O**	
	IN	**OUT**	**IN**	**OUT**
DX85M-P8	12x PNP (I+O = 12 max)	12x PNP (I+O = 12 max)	/	/
DX85M4P4M2M2	4x PNP	4x PNP	2x 0-20 mA	2x 0-20 mA
DX85M0P0M4M4	/	/	4x 0-20 mA	4x 0-20 mA

FlexPower Sensors

FlexPower sensors for use with FlexPower Nodes or FlexPower Nodes with Serial Interface			
Model	**Description**	**Model**	**Description**
M12FTH4Q	Serial Temperature/RH sensor calibrated ± 2%		
BWA-ACC-SEN-SDI	Acclima SDI-12 soil moisture transducer	**SM312LPQD-78447**	Low power MINI-BEAM, 5 V, polarised retroreflective, 3 m range
QS30WEQ	Low power QS30 emitter, 3.6-5.5 VDC, 30 m maximum range	**SM312DQD-78419**	Low power MINI-BEAM, 5 V, diffuse, 38 cm range
QS30WRQ	Low QS30 power receiver, 3.6-5.5 VDC, 30 m maximum range	**QT50ULBQ6-75390**	Low power QT50U, ultrasonic, 8 m range

More Housing options

L model without LCD

IP20 housing with external terminal blocks

ATEX Zone 2 certification

IP54 housing with internal battery

Solutions available for ATEX Zone 1 with 24 VDC and Ex d enclosure

Accessories

Antenna Cables	
RP-SMA to RP-SMAF Bulkhead (RG58 cable loss: 1.05 dB/m)	
BWC-1MRSFRSB0.2	0.2 m cable
BWC-1MRSFRSB1	1 m cable
BWC-1MRSFRSB2	2 m cable
BWC-1MRSFRSB4	4 m cable
RP-SMA to N Male (LMR200 cable loss: 0.56 dB/m)	
BWC-1MRSMN05	0.5 m cable
BWC-1MRSMN2	2 m cable
N Male to N Female (LMR400 coaxial, cable loss: 0.22 dB/m)	
BWC-4MNFN3	3 m cable
BWC-4MNFN6	6 m cable
BWC-4MNFN15	15 m cable
BWC-4MNFN30	30 m cable

Antennas – Indoor		
Model	**Type**	**Description**
BWA-2O2-C	RP-SMA Male	2 dBi antenna indoor
BWA-2O5-C	RP-SMA Male	5 dBi antenna indoor
BWA-2O7-C	RP-SMA Male	7 dBi antenna indoor

Antennas – Outdoor		
Model	**Type**	**Description**
BWA-2O6-A	N Female	6 dBi antenna outdoor
BWA-2O8-A	N Female	8.5 dBi antenna outdoor
Model	**Description**	
BWC-LFNBMN-DC	Bulkhead, N Type – Surge Suppressor	

Connectors for DX80PM Top & Bottom	
1/2-inch NPT Hub Entrance	
Model	**Description**
BWA-QD5.5	M12 connector 5-pin
BWA-QD8.5	M12 connector 8-pin
BWA-QD12.5	M12 connector 12-pin

Convertor cable for User Configuration Tool	
Model	**Description**
BWA-HW-006	RS-485 to USB adapter, 1 m for DX80 IP67
MQDMC-401	RS-485 to USB adapter, 0.5 m for DX80 IP20
	The User Configuration Tool uses a USB to RS-485 converter to connect a standard Gateway or Data Radio Master to a USB connection on a computer.

Power options

Power Supply, Battery Box, Solar Panel	
Model	**Description**
PSDINM-24-10	DIN-mountable Power Supply, input 85…264 VAC; output 24 VDC, 1 A
PSB4MK-24-10	Power Supply, input 85…264 VAC; output 24 VDC, 1 A; IP66 enclosure
DX81	1 Battery
DX81P6	6 Batteries
DX81H	1 Battery for DX99 – ATEX
BWA-SOLAR-001	Solar Panel Kit

Wireless Q45 Sensors

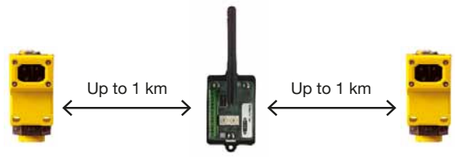
Q45

Wireless Sensors

Wireless Q45 Sensors			
Model	**Sensing Mode**	**Model**	**Sensing Mode**
DX80N2Q45LP	Polarized Retroreflective (range up to 6 m)	**DX80N2Q45D**	Diffuse (300 mm sensing range)
DX80N2Q45CV	Convergent (1.5" focal point)	**DX80N2Q45RD**	Remote Device Interface (two discrete IN)
DX80N2Q45F	Fibre Optic (1.3 m in opposed mode with IP23S fibres or 100 mm in diffuse mode with BT23S fibres)	**DX80N2Q45BL-RG**	Button/Light with 2-colour LED indicator (red and green)

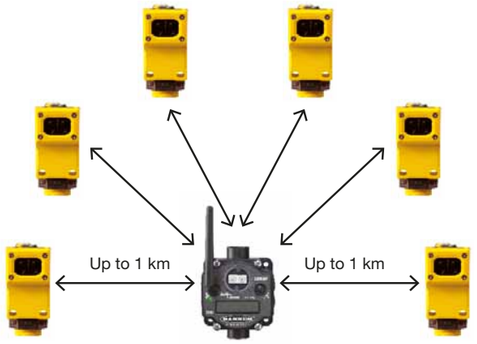
Two Point System

- True self-contained wireless sensors without cables nor external power and with a built-in antenna
- Board Gateway supports one or two sensors



Six Point System

- DX80 Gateway: wireless network master manages wireless communication and provides electrical outputs for attached wireless sensors
- Gateway supports up to 6 sensors via pre-mapped configuration
- Multiple I/O: supports a wireless network of up to 47 wireless Q45 sensors per Gateway



DX80

Pre-mapped Gateway for Wireless Q45 Sensors

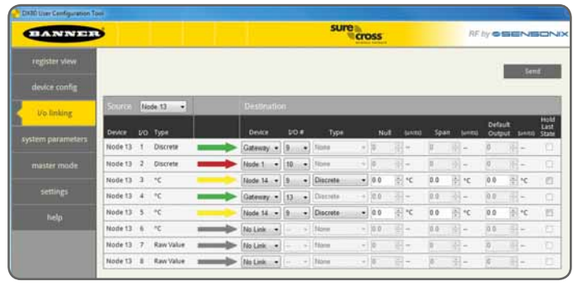
DX80 Pre-mapped Gateway for wireless Q45 sensors				
Model	**Sensor Inputs**	**Topology**	**Housing Style**	**Rating**
DX80G2M6-B2Q	2	Two point system	Board Mount	/
DX80G2M6-QC	6*	Six point system	External Terminal Blocks	IP20
DX80G2M6-Q	6*	Six point system	Sealed Enclosure	IP67

* Up to 47 sensors possible using Modbus Host System
Wireless sensors can also be connected to all 2.4 GHz DX80 Gateways

User Interface

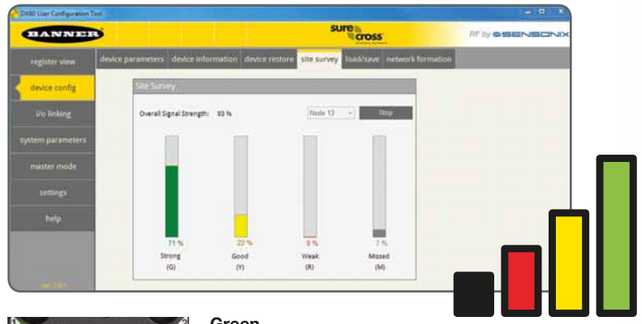
The free User Configuration Tool uses a USB to RS-485 converter to connect a standard SureCross DX80 Gateway or Data Radio Master to a USB connection on a computer. Once connected, the User Configuration Tool will define the one to one I/O linking and setup parameters of the wireless system. It is the perfect tool to test applications and check installations.

User Configuration Tool (UCT)



Site Survey

Use the Site Survey screen to conduct a Site Survey between the Gateway and a selected Node.



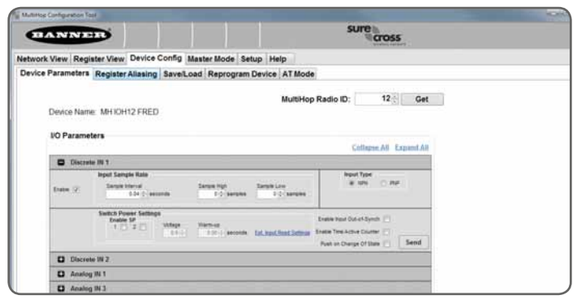
Green
Packets received at a strong signal strength.

Yellow
Packets received at a good signal strength.

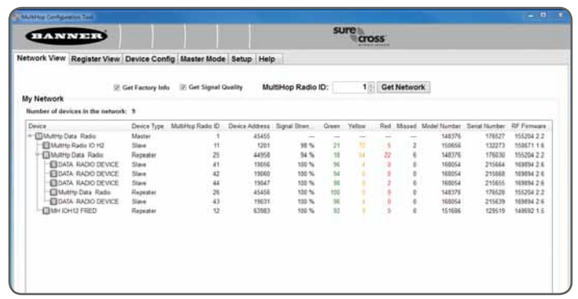
Red
Packets received at a weak signal strength.

Missed
Packets not received on the first transmission and requiring a retry.

Device Configuration

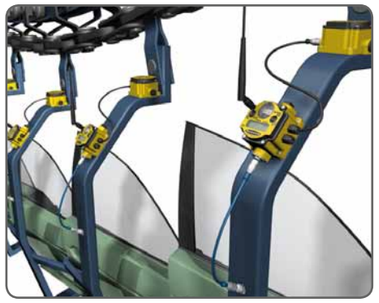


Network View of the Data Radio Tree Organisation



Applications by Industry

Factory Automation

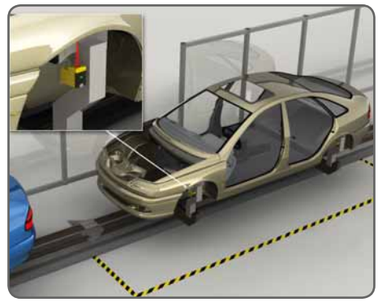


Material Handling

Using a wireless sensor network to detect the presence of product makes data gathering and network maintenance easier and loss costly.

Call for Parts

Production operators need a way to easily call the forklift drivers to deliver additional parts or to remove completed assemblies from the work stations.



Production Efficiency

Notification system with wireless Q45 sensors and EZ-LIGHTs. When a technician is needed on the production line, the button is pushed.

Process Automation

Tank Level Monitoring

Measure liquid level and activate a pump or open a valve with a Wireless FlexPower Node.

Flow Control

Collect Flow Data with intrinsically safe Wireless Nodes that provide battery power to the radio and transmitter (ATEX).

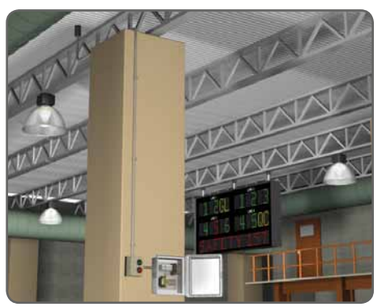
Gas Analysis

Continuous emission monitoring of chimney output variables with a Wireless data network.

Building Automation

Storage Control

Control ambient Temperature and Humidity in high value storage areas with a battery-powered Node and integrated sensor.



Energy Management

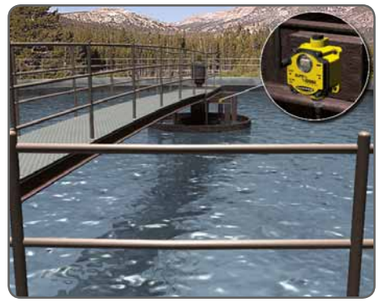
A wireless monitoring system offers facilities a simple solution to increase efficiency by saving energy and conserving plant resources.

HVAC Management

Control energy costs with a wireless network that automatically controls HVAC systems based on real-time data.

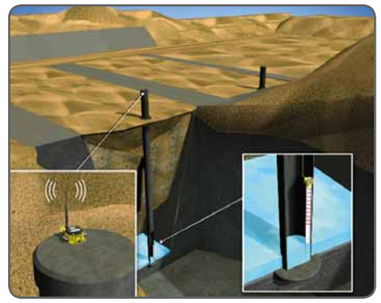
Applications by Industry

Environmental



Water Treatment

Monitor multiple data points such as pH, conductivity, level and temperature with a single Wireless Node with up to 4 analogue inputs.



Landfill

Gather leachate levels and monitor pump status with total count of extracted volume using a single Wireless Node optimised for battery-power.

Compost

Monitor internal windrow temperature to optimise compost production process with a probe including the Wireless Node and Thermocouples.

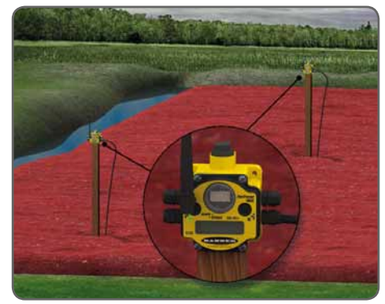
Agriculture

Greenhouse

Control climate variables in a commercial greenhouse with a Wireless Temp and Humidity Node optimised for battery-power.

Irrigation

Control system pressure, solenoid valve activation and counter input on a Wireless Node optimised for battery-power.



Soil Moisture

Continuously monitor and control soil moisture with a Wireless Network for gathering data from the field and activating pumps in remote locations.

Transportation & Logistics

Cranes

Control position and status, coordination for anti-collision of cranes with a Wireless I/O network.

Manage AGV Routing

Use a Wireless Network to schedule AGV routes to improve efficiency and eliminate long wiring runs.

Loading Dock Notification

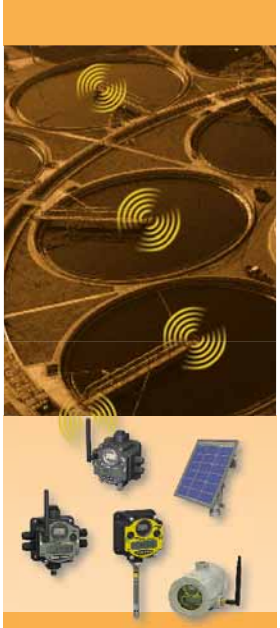
Automatically alert operators that a truck has arrived at a loading dock with a Wireless M-GAGE Node embedded in the ground.

Sensors

- Presence/Absence Detection
- Foreground & Background Suppression
- GO/NO GO Inspection
- Gating and Triggering
- Parts Counting
- Level and Distance Measurement
- Positioning
- Contrast and Colour Sensing
- Vehicle Detection (Radar, Ultrasonic & Magnetic Technology)

Vision

- Vision Sensors with Onboard User Interface
- Pattern Recognition
- Traceability (Barcode, Datamatrix and Text Reading)
- OCR/OCV
- Complex Part Inspection
- Part Orientation
- Assembly Verification
- Colour Inspections



Wireless I/O

- Slip Ring Replacement
- Tank Farm Monitoring
- Livestock Environmental Monitoring
- Water and Wastewater Treatment
- HVAC Remote Monitoring
- Traffic Monitoring & Control
- Remote Sensing in Process Automation
- Cable Replacement
- ATEX Approved Solutions

Lighting & Indicators

- Bin & Part Picking
- Error/Mistake Proofing
- Pick-to-Light & Put-to-Light
- Operator Guidance
- Call for Parts
- Incorrect Pick Signal
- Remote Start/Stop Indication
- Work Station Lighting
- Mobile Equipment Work Lights
- Production Machine and Cabinet Lighting

Machine Safety

- Safety Light Screens
- Ergonomic Two-Hand Control Devices
- Safety Modules
- Emergency Stop Devices
- Safety Interlocking
- Laser Scanners for Safety Applications
- Programmable Safety Controllers
- Enabling Devices

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