Solutions for the Automotive Industry

BANNER®

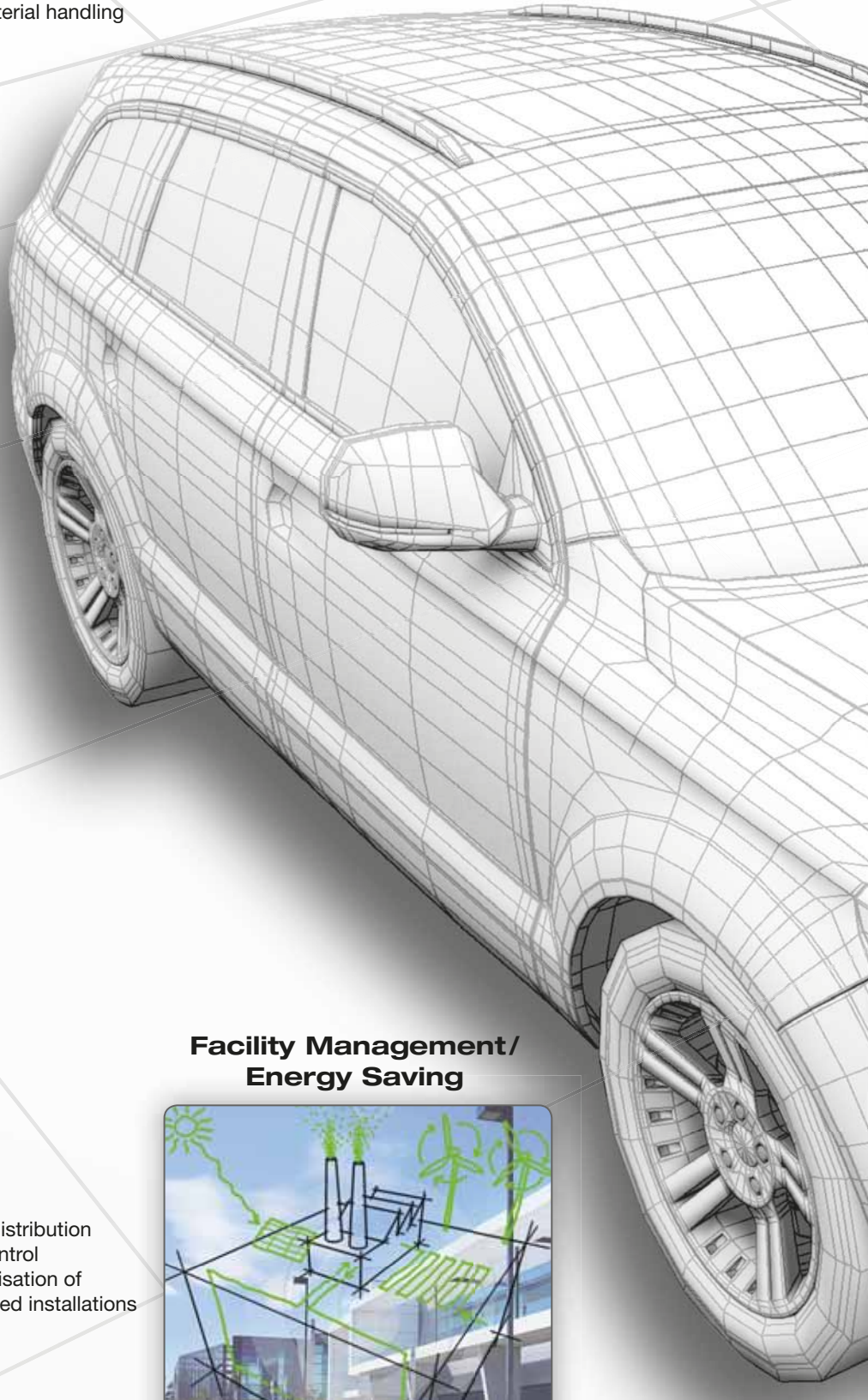
more sensors, more solutions

Comercial Andaluza de Técnicas y Suministros, S.L. (CATS, S.L.) Málaga (España). Telf: +(34) 952 24 61 37 www.cats.es comercial@cats.es

Intelligent Solutions for Complex Processes

Powertrain

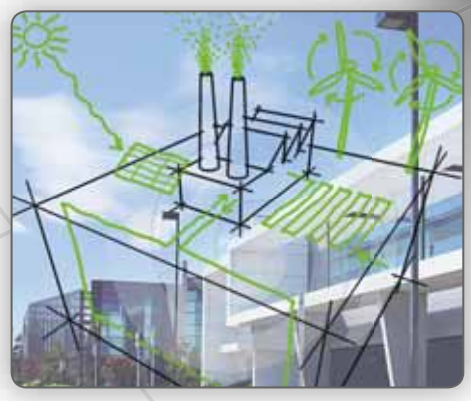
- Casting of engines and transmissions
- Machining
- Heat treatment
- Assembly and test
- Material handling



General Assembly

- Chassis assembly
- Trim, fit and finish
- Final assembly

Facility Management/ Energy Saving



- Power distribution
- Door control
- Harmonisation of distributed installations

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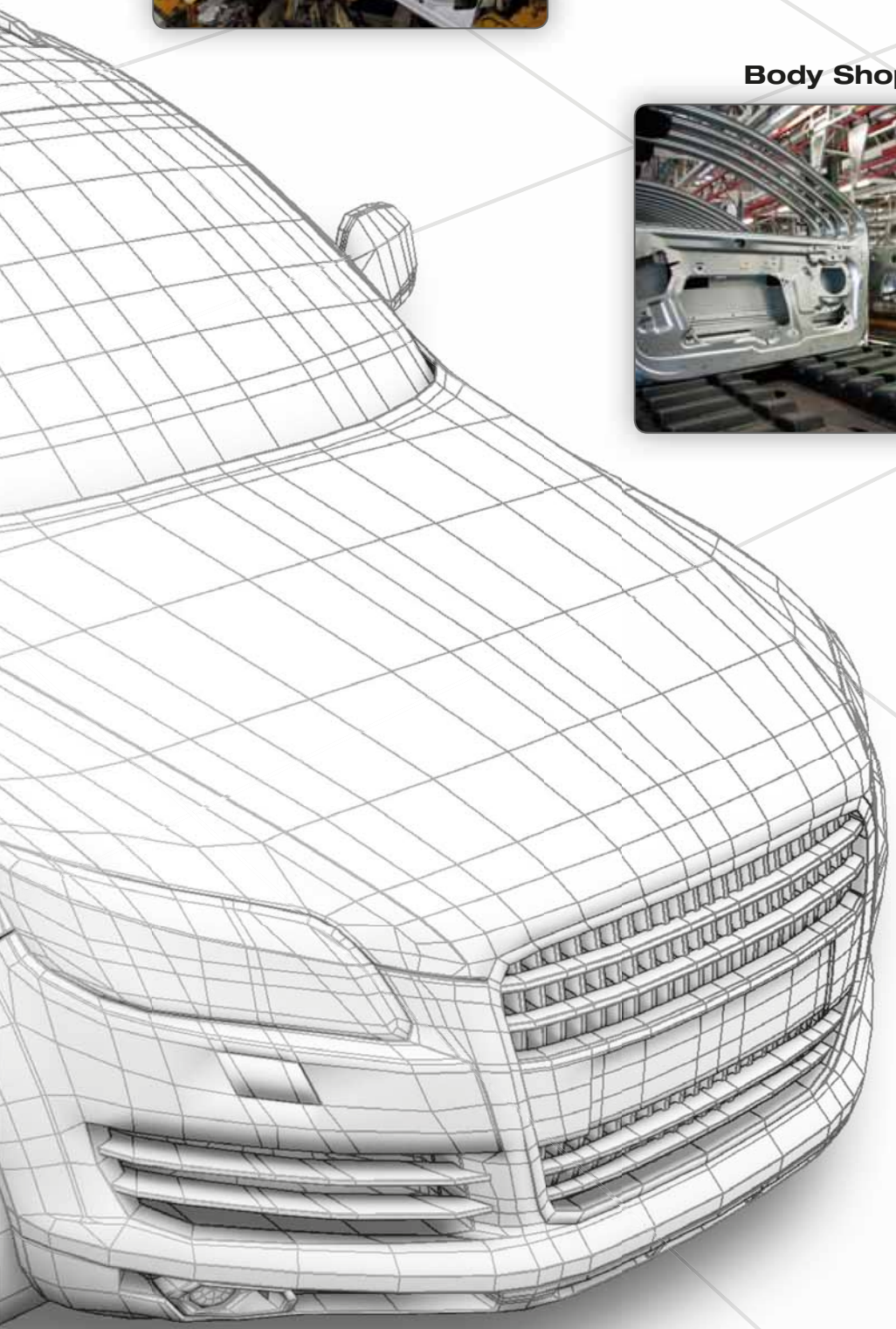
Comercial Andaluza de Técnicas y Suministros, S.L. (CATS, S.L.) Málaga (España). Telf: +(34) 952 24 61 37 www.cats.es comercial@cats.es

Press Shop

- Material handling
- Stamping and metal fabrication
- Sub-assembly



Body Shop

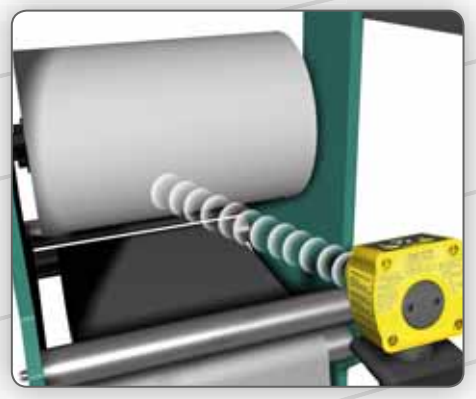
- Automated welding
- Application of adhesives, beads and sealants
- Robot-intensive assembly

Paint Shop

- Cleaning of finished body
- Sealing and adding primer
- Painting and top coating
- Cure and drying
- Material handling and robotics

Press Shop

As the fundament of car production, the quality and operational capacity of body parts must be correct. In nearly all areas of the press shop Banner sensors are used. They ensure stable processes, optimum load, quality inspection and right-on-time production of finished parts.

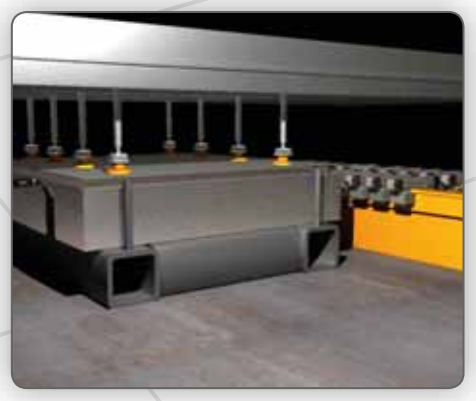


Coil diameter/loop & tension control

The tension control on the metal being fed from a coil into the process is basic for process stability. Older loop controls lack repeatability and are too easily affected by ambient noise, or fail to detect shiny surfaces reliably.

The Banner ultrasonic sensors improve the application reliability. Customers have the choice of models with various ranges up to 8 m with both discrete and analogue outputs.

QT50U – Ultrasonic sensor



Double blank sheet detection

Traditional inductive-base double blank detectors require critical set-up to perform properly.

The Banner *Presence* PLUS vision sensors improve the verification reliability and provide a non contact solution. Banner offers the right choice of vision sensors, lenses and lighting to meet the range of metal thickness and distance to target.

P4 – Smart sealed camera & ring light

Error proofing

Many metal parts have punch holes to accommodate other parts in the assembly process. To verify that the expected number of holes exist on a metal part that is not rigidly fixed, use an iVu Series sensor configured for an Area with Motion application.

The sensor evaluates all the holes to make sure that they are present and correctly sized. If not, the sensor sends a fail output so the part is rejected.

iVu – Touch screen vision sensor

Part out and removal

Reliable detection of the stamped metal panels that exit the press on the large belt conveyor is important as they are diverted to multiple removal stations. The parts may bounce on the conveyor or could be bent, so single-point sensors may not be sufficient.

A cost-effective solution is given by using Banner array sensors, which allow multi-point detection.

EZ-ARRAY – Measurement light curtain

Body Shop

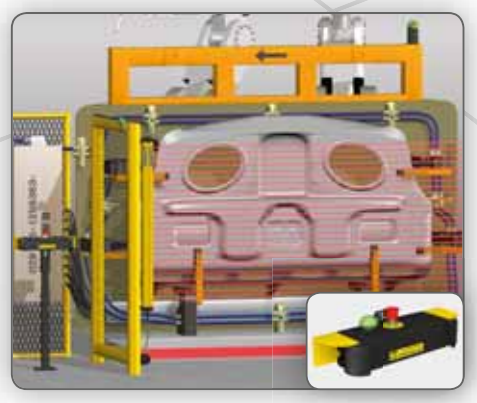
Various components are combined to form a strong and homogeneous vehicle base: the body. The body shop is one of the vital production steps in automotive production. Banner sensor solutions allow precision processes under speed and safe conditions.

Dispensed bead detection

In today's body shop it is becoming increasingly common to use adhesives to join panels (sunroof, hood, doors, body sides…) rather than welding them together. To ensure proper strength and quality of the final assembly, the adhesive bead has to be in the right location and needs to be continuously in the correct width.

The solution with Banner IP68 *Presence* PLUS *Pro* II Bead and a high intensity strip light offers a vision sensor capable of evaluating a relatively large area, performing measurements and is able to contend with acceptable differences between each panel due to dispensing and material handling tolerances.

Pro - Smart sealed camera & sealed linear array light



Cycle start welding cell

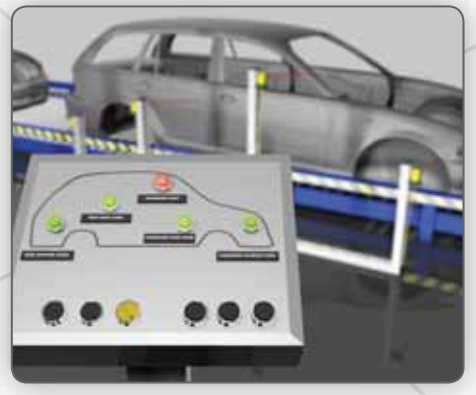
In semi-automated operations, such as a robotic welding cell, operators must be protected from hazards by having a safe cycle start without having personnel inside the cell.

Banner's DUO-TOUCH Run Bar offers an ergonomic solution for cycle start with reduced hand and arm stress, all in accordance with global safety standards.

The flexible mounting options in combination with a quick disconnect version allows flexible integration. Customers have the choice to include E-Stops or Banner EZ-LIGHTs into the run bar housing for process visualisation.

DUO-TOUCH – Two hand control

SC22-3E – Safety controller



Process visualisation

Process visualisation informs the operator about system and process status at a glance up close and far away.

Banner EZ-LIGHT indicators offer a great solution with lower installation and maintenance costs. T18 or T30 housing can contain up to 3 colours, which provide clear information based on customer definitions.

Banner offers a wide selection of brackets which provide space to affix a legend or tag.

EZ-LIGHT – Indicators

Weld tip inspection

The quality of welding is one of the most fundamental processes in car production. Bad welds cause rework or scrap of sub-assemblies or whole bodies.

The Banner high contrast fibre sensor R55F in combination with a stainless steel fibre block allows very accurate detection of both tips of a welding gun. Even small non-machined or oxidation spots can be detected within a single robot position stop. The inspection increases the welding spot quality, reduces the machine down-time and finally, saves costs.

R55F – Fibre sensor

Paint Shop

The automotive paint shop is characterised by a zero fault tolerance environment, which means highest demands with respect to availability and energy efficiency, non-stop production and harsh production environment (heat, fouling…). Banner sensors and systems are designed to perform reliably in this demanding environment.

Colour match/Primer verify

Verifying that the actual body colour matches the build manifest is an important quality check, technologically demanding.

The Banner Colour Vision Sensor in combination with a diffuse lighting method is the right solution. As the vehicle enters the station, the program settings – based upon the target colour – are sent to the camera. Upon inspection, the sensor compares the actual to the intended colour, and passes or fails the inspection, activating the appropriate output. Even small colour deviations are reliably detected.

P4 Colour – Smart colour camera

Vehicle detection

The reliable detection of a vehicle presence is an optical problem due to different colours.

The Banner T30UX ultrasonic sensor with integrated temperature compensation is the right choice for diffuse sensing with no sensitivity to colour or reflectivity. Utilising the sensing window limits gives users also the choice of precise detection, in this example the roof, but not the hood.

T30UX – Ultrasonic sensor

Conveyor link inspection

In a paint shop, a continuous conveyor link is crucial, especially in the oven. In this application, broken parts stopped/damaged the chain in the oven, which could create a downtime of 12+ hours. The solution is a chain-link inspection with Banner Vision Sensors, so they can detect a crack in the chain link early and repair it in a controlled environment.

This installation uses two area lights on either side of the *Presence* PLUS sealed vision sensor. A crack can easily be distinguished from the normal plain gray surface. In this case, an early-warning is issued and countermeasures are activated.

P4 – Smart sealed camera & area light

Predictive maintenance

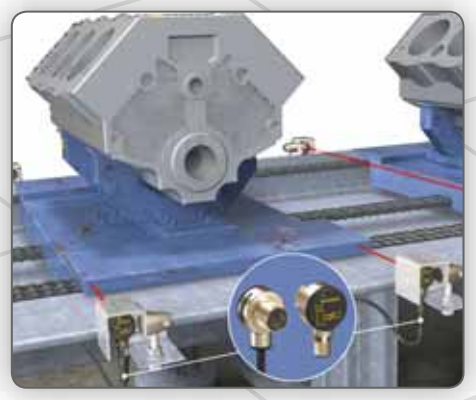
In the paint shop you find a lot of distributed critical devices like pumps & drives which need to be checked frequently for proper operation. Maintenance staff has to inspect these devices regularly to avoid break down of production.

The Banner Wireless I/O temperature sensing solution improves the process with early-warning for bearing and coupling overheating due to wear, and releases allocated human resources.

Wireless I/O network – Temperature/ humidity sensors

Powertrain

Today, automotive powertrain requires a high variety of models, in combination with shorter life cycles, cost-efficient manufacturing and optimised logistic processes. Banner sensors and solutions allow for this optimization in combination with cost-effective, rapid and global availability.



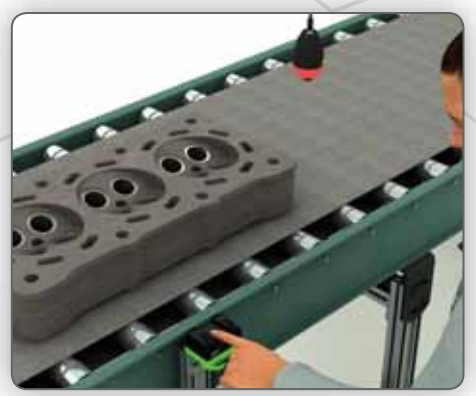
Heavy-duty part positioning

In heavy-duty applications, sensors can be easily damaged during machine assembly, transport, maintenance and operation. The right choice in these environmental conditions is the TM18 sensor.

It has been redesigned and offers superior detection regardless of environmental conditions. The enhanced nickel-plated, die-cast zinc, IP69K rated design is the perfect solution for wash-down applications and industrial environments where a compact and heavy-duty design is vital to prevent damage to the sensor.

With a right angle shape, and an 18 mm threaded barrel mount, the TM18 readily fits into tight spaces.

TM18 – Heavy-duty, compact sensor



Cycle start/Visual management

Existing mechanical buttons are low-force, but there are occasions where the button needs to be pushed a second time with more attention paid to proper depression.

The Banner VTB (optical touch button with light indicator) improves through-put and ergonomics by upgrading the 'cycle start' actuation from mechanical button to ergo non-contact actuator.

Main characteristics: no physical force required, IP66 rating, can be used in oil contaminated environment, process status view at a glance.

Optical touch buttons

Quality traceability

Traceability is one of the keys to success to improve processes and quality.

A very effective product for barcode reading is the Banner iVu BCR vision sensor. The IP67 rated sensor allows you to read almost every kind of barcode (printed, embossed, lasered…), without having image processing expertise or a need for a PC.

The data communication can be done by RS-232 or Ethernet.
The Banner remote command channel enables more advanced communication between the iVu sensor and a PLC.

iVu – Touch screen barcode reader

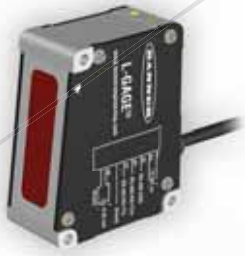
Bead position identification

Before applying a bead on an engine block with a robot, the position needs to be identified with high precision – especially shiny surfaces, which might also be contaminated with oil, are very challenging.

The high precision, extremely accurate, robust and self-contained, IP67 rated LH series laser sensor is a perfect solution for measurement on moving processes, hot parts, machined parts, and soft or sticky parts.

The analogue output or RS-485 communication perfectly matches to embed the sensor on the robot bus.

LH – High-precision laser sensor



General Assembly

Automotive assembly lines require a flexible JIT/JIS flow of material conveyor mixed with continuous quality checking and tracking. Banner solutions will enable customers to optimise processes and to save costs.

Operator guidance

Today's assembly processes are based on continuous error proofing to achieve a target of zero defect. The Banner PTL (pick-to-light) sensors enable customers having an industrial solution to accommodate from small shelves to pallet storage places.

Depending on company philosophy, having proof of picking, operator confirmation, or just light indication, we enable our customers to handle a large diversity of part combinations. We also help save them time and increase quality on the assembly process cycle.

Carrier bearing temperature

The reduction of downtime on the conveyor line can be achieved by periodic verification of the correct grease level in the bearings. But there is still a risk of bearings over-heating and seizing.

Banner T-GAGE temperature sensors allow permanent bearing monitoring and early warning with non-contact temperature sensing. Multiple T-GAGE sensors are mounted on the conveyor line. When a carrier passes, the bearing temperature is detected, and in case of exceeding the maximum temperature, the sensor output is activated.

Quality or process problem detection

Andon methodology, which stands for a system notifying to management and other workers a quality or process problem, is part of a quality management system. The task is to provide a reliable, highly visible and attractively priced solution for an Andon rope pull application.

The Banner rope pull bracket used with a 360° visible K50 indicator offers flexible rope mounting and provides significant cost savings by eliminating old-fashion junction boxes embedded into one electronic device. Optional hosting of a wireless node gives additional installation flexibility.

Precise body positioning

Before the car is assembled in the final trim, the bodies have to be placed precisely on the conveyor pallets. Misalignment of the body to the pallet bolts means stopping the line and increasing cycle time.

The Banner EZ-ARRAY measuring light-screen provides a resolution down to 2,5 mm and a variety of measurement modes along with digital, analogue and serial outputs to address a wide range of application requirements. It is the perfect match for an easy integration into the placement process from lifter to pallet.

EZ-ARRAY – Measurement light curtain

Facility Management/ Energy Saving

Automotive manufacturing uses high energy consuming processes. Energy saving is the key to conserving environmental resources and saving costs immediately. Banner offers simple and effective solutions for energy saving, even when additional solutions need to be integrated into a running plant.

Energy saving – Lighting

In many plants, power is wasted due to missing control. One example is lighting of a plant with distributed light pylons. These pylons are just controlled by timer and lighted during weekends, bank holidays or non-work days.

Banner Wireless MultiHop devices enable our customers to control lights individually. This solution allows for installation without digging cables, requires less electrical power and operation hours, and enables longer lifetime of lights, which provides enormous environmental and monetary savings.

MultiHop Data Radio – Wireless I/O network

Cabinet lighting

Traditional lighting of work spaces or cabinets needs a lot of energy in combination with high maintenance and spare parts efforts.

The WLS28 Work Light Strips from Banner, market leader for industrial LED lighting, is the right answer. It offers extremely bright, long-lasting LED technology for >50 000 lifetime hours, low power consumption on industrial 12 V to 30 V power supplies.

Energy saving – Exhaust ventilation

High power drives used for roof exhaust ventilation provide savings potential by turning off the load when not used.

Typical controls use hard wired motor starters that cannot be turned off between shifts and weekends because they are mounted on hard to reach places, such as the roof, for example. The PLC needs also field wiring with remote I/Os to motor starters.

The Banner DX80 Wireless I/O solution saves installation time and operational costs allowing the ROI to be achieved within a short period.

DX80 Gateway & Node – Wireless I/O network

Rain/ground water retention

In some plants, rain or ground water may endanger the whole production. Therefore, the water level has to be monitored and pumps activated to evacuate water.

The Banner SureCross DX80 wireless network is the right solution to communicate the water level detected by Banner ultrasonic sensors from different drains and to activate distributed pumps.

Avoiding digging cables into the ground generates huge savings. Continuous monitoring is more reliable than random employee checks.

Wireless I/O network – FlexPower node with solar panel

QT50U – Ultrasonic sensor

Discover the Banner Solutions

Vision Sensors, Smart Cameras and Vision Lighting

- The *Presence* PLUS and iVu vision sensors are great tools for error proofing and traceability.
- The unique iVu vision sensor can be configured using the touch screen display without any PC. Customers can choose between models with different error proofing algorithms, or ones that can read the most common barcodes.
- The one-piece, self-contained vision sensor *Presence* PLUS comes in a compact package and offers a great range of tools plus premium features like BCR, BEAD and OCR/OCV.
- An RS-232 or Ethernet communication can be used for data exchange or PLC control on the Remote Command Channel.
- The extended range of Banner vision lighting offers the right solutions in customer applications.
- Part of the Banner customer service philosophy are the free-of-charge Firmware and Software Updates.

No PC required

Easy configuration

Sealed versions available

USB compatible

"Operator Guide" and Pick-to-Light Devices

- Banner understands the challenges and processes in automotive industries and offers a full range of products from featured indicators up to fully controlled Pick-to-Light devices.
- Pick-to-light and sequence-guided error-proofing with Banner devices.
- Banner devices are suitable in operations from small boxed pieces in the rack, up to big components on a pallet.
- Clever process management and next generation operator guidance with multi-colour EZ-LIGHT indicators.
- Fully industrial IP rated quality, even with buzzer available.
- Banner offers the perfectly adopted accessories like cable and brackets for easy integration into customer's environment.
- I/O block and ASi power compatible versions available.
- Individual customer modifications like special colour schemes, miss-pick logic… are possible.

Robust housing

Extremely long life time

Varying colours modes

Daylight visible

Task, Panel and Machine Lighting

- Panel and machine lighting provides bright, even illumination in enclosure interiors for increased visibility during component installation, maintenance and monitoring.
- Also perfect for work stations with poor factory lighting.
- Extremely long-lasting LED technology allows >50 000 hours of continuous working life and very low power consumption.
- High-power LEDs are the right choice for superior illumination with an even pattern of light and no shadows.
- The durable, compact and IP rated housings can be mounted out of the way, even in wet and dirty environments.
- Huge variety of mounting brackets that are designed for easy installation and exact light adjustment.

Robust housing

Sealed versions available

Easy installation

Vibration resistant

SureCross Wireless I/O Network

Built-in signal strength

Configurable & mapped I/O

Power options

Link loss output

- Banner offers one of the biggest choices of wireless products in the industrial market.
- The housings are robust and IP67 rated; ATEX solutions are available.
- The Banner SureCross Wireless I/O works perfectly in coexistence with WiFi equipment.
- Reliable performance is provided by Frequency Hopping Spread Spectrum protocol and optional Mesh topology.
- Signal range is up to 3 km (2,4 GHz) for free line of sight.
- Cost efficient solution for upgrading & expanding installations.
- FlexPower technology enables battery lifetime of nodes up to 5 years.
- Huge variety of industry specific connectivity: e.g. Modbus (RTU or TCP) and Ethernet IP.

EZ-SCREEN Light Curtain; I/O Block Compatible

- EZ-SCREEN safety light curtains comply with common remote safety I/O blocks.
- Plug-and-Play installation with M12 cable connection and easy DIP Switch setting. No PC for configuration required.
- The EZ-SCREEN family can be powered from the I/O block only because EZ-SCREENs have the lowest power consumption on the market; no need for additional power supply.
- The low profile version EZ-SCREEN LP is also available with embedded muting.
- The Banner EZ-SCREEN safety light curtains offer an easy and cost effective solution to add safety devices to existing installations.

Easy configuration

No PC required

Low power consumption

Fast response time

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

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 lights and cabinet lighting

Machine Safety

- Safety Light Screens
- Optical Non-Contact Safety Systems
- Ergonomic Two-Hand Control Devices
- Safety Modules
- Emergency Stop Devices
- Safety Interlocking
- Laser Scanners for Safety Applications

Banner Engineering's Worldwide Presence

Headquarters USA
Banner Engineering Corp.
9714 Tenth Avenue North
Minneapolis, Minnesota 55441
✆ +1 763 544 3164
Fax: +1 763 544 3213
sensors@bannerengineering.com
www.bannerengineering.com

China
Banner Engineering Shanghai Rep Office
Rm. G/H/I, 28th Flr.,
Cross Region Plaza
No. 899, Lingling Road,
Shanghai 200030
✆ +86 21 54894500
sensors@bannerengineering.com.cn
www.bannerengineering.com.cn

Japan
Banner Engineering Japan
Cent-Urban Building 305
3-23-15 Nishi-Nakajima
Yodogawa-Ku, Osaka 532-0011
✆ +81 6 6309 0411
mail@bannerengineering.co.jp
www.bannerengineering.co.jp

Taiwan
Banner Engineering Int'l Incorporated Taiwan Rep. Office
8F-2, No. 308, Sec. 1, Neihu Rd.
Taipei 114
✆ +886 2 8751 9966 #15
info@bannerengineering.com.tw
www.bannerengineering.com.tw

Europe, Middle East, Africa
Banner Engineering EMEA
Park Lane, Culliganlaan 2F
1831 Diegem | Belgium
✆ +32 (2) 456 07 80
Fax +32 (2) 456 07 89
mail@bannerengineering.com
www.bannerengineering.com/eu

India
Banner Engineering India – Pune (HQ)
Office No. 1001, 10th Floor
Sai Capital, Opp. ICC
Senapati Bapat Road
Pune 411016
✆ +91 20 66405624
salesindia@bannerengineering.com
www.bannerengineering.co.in

Mexico
Banner Engineering de Mexico Edificio VAO
Av. David Alfaro Siqueiros No.103
Col. Valle Oriente C.P.66269
San Pedro Garza Garcia, Nuevo Leon
✆ 52-81-8363-2714
mexico@bannerengineering.com
www.bannerengineering.com.mx

Turkey
Banner Engineering Elk. San. Ve Tic. Ltd. Sti.
Barbaros Mah. Uphill Court Towers A
Blk D:49 34746 Atasehir Istanbul
✆ +90 216 688 8282
Fax: (+90) 216 688 8181
turkey@bannerengineering.com.tr
www.bannerengineering.com.tr

Banner offers a full range of sensing solutions

www.bannerengineering.com/eu

BANNER®

Comercial Andaluza de Técnicas y Suministros, S.L. (CATS, S.L.) Málaga (España). Telf: +(34) 952 24 61 37 www.cats.es comercial@cats.es

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