SNAP **SIGNAL**

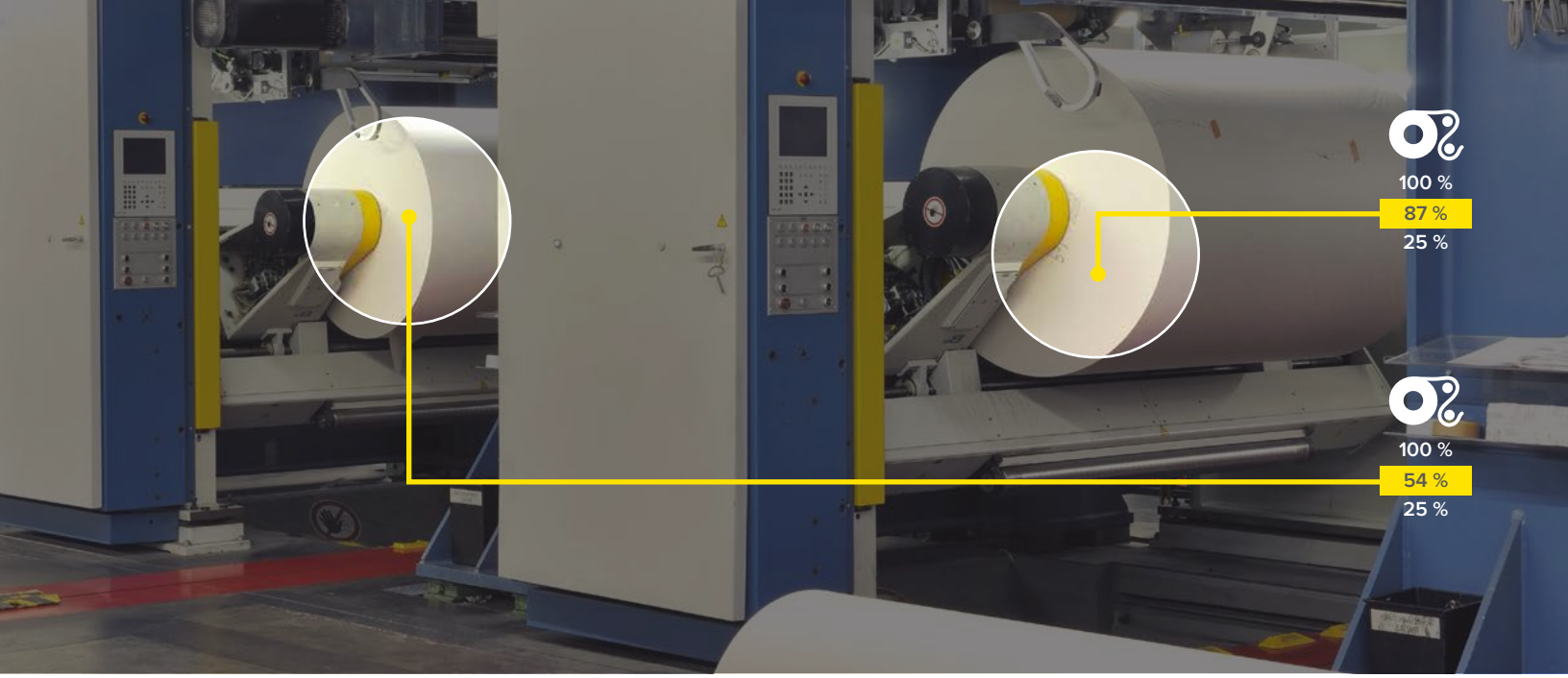
The 5-Step Guide to Modernizing Your Factory

Unlocking Data from Your Existing Equipment is Easier Than You Think

BANNER®

more sensors, more solutions

It happens all the time, legacy equipment functions as intended but doesn't offer today's remote monitoring capabilities. Facility management and staff know that capturing performance data from their equipment would enable better decisions but often fear it's difficult to add the technology. That may have been true in the past, but today – with Banner's Snap Signal plug-and-play products – it's easier than you may think. This guide will walk you through a simple approach to upgrading legacy equipment and gaining new insights into your operation.



1 Identifying Actionable Data Locked Inside Your Equipment

Have you ever looked at the sensor on your conveyor, or tower light on your case packer and considered how much information it could potentially provide you with? At Banner, we call this “actionable data.” Photoelectric sensors may be currently used to trigger various steps of the process on your machine, but they can also be a source of measuring overall equipment effectiveness (OEE). Once your data is unlocked, each time a product passes a sensor, the data becomes actionable. The same could be true for tower lights, which are commonly used to notify staff whether the machine is operating correctly, is out of materials, or is stopped for some reason. While this indicator provides local benefits, think how helpful the data would be to someone who was trending the downtime of all machines based on the tower light status. Comparing downtime among machines can help drive your continuous improvement efforts by aiming your projects at the underperforming machines.

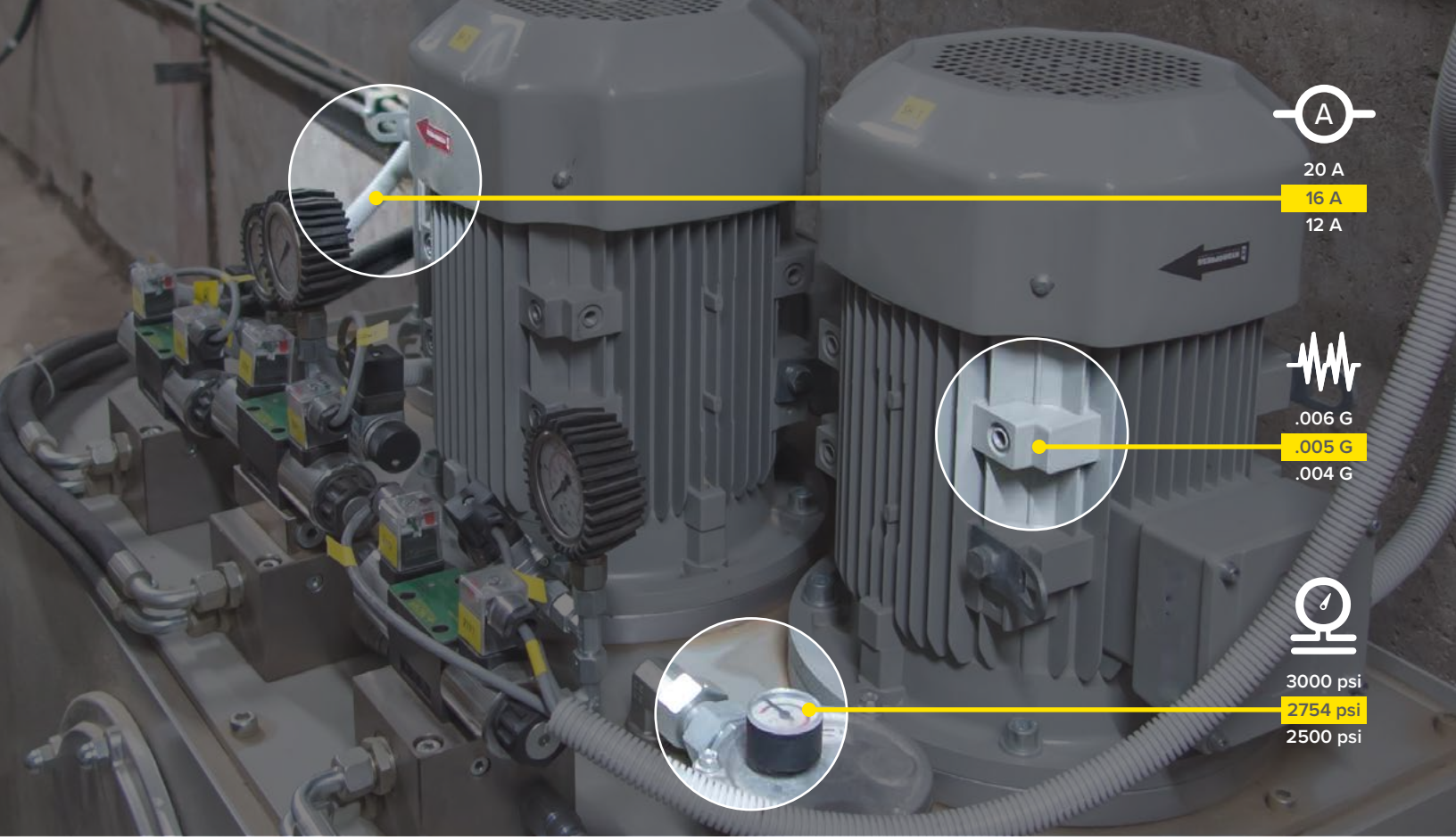
Traditional approaches to IIoT may require removing all existing sensors and other control devices and adding new. Not only is this expensive, but it generates waste from removing components that are working well. And it introduces risk, as you’re making large changes to equipment that could create unnecessary downtime. Another approach that is often considered is accessing the data inside the PLC or HMI on the machine. However, these devices are often locked down after the machine build, and making changes could pose further risk to the performance and uptime of the machine. At Banner Engineering, we take a less invasive approach by tapping the data from the devices you already have installed by creating an “overlay network” that operates alongside your existing device infrastructure.

2 Unlocking Actionable Data

Start by looking at the devices you have on your machines and consider whether the data is useful or needed. In the bottling example above, not every sensing point may be valuable, but some certainly will be. Also, look beyond sensors. Do your control panels have indicator lights that tell operators if something is wrong? This is actionable data. You can begin monitoring this machine data to trend how often a particular condition presents itself and then make a plan to improve it.

Unlocking this data from existing devices is usually as simple as adding a splitter connection to “listen in” on the signals. For example, the bottling application’s photoelectric sensor – being used by the existing control system – likely has an M12 connector. If not, a field-wireable one can be easily added. This connector makes it easy to use a splitter cable to begin monitoring the signal. It is important to point out that with this method, you are not interrupting anything, you are simply listening in. With the splitter connected to the sensor, one branch of the splitter stays connected to the the PLC and the other branch goes to the new Snap Signal overlay network.

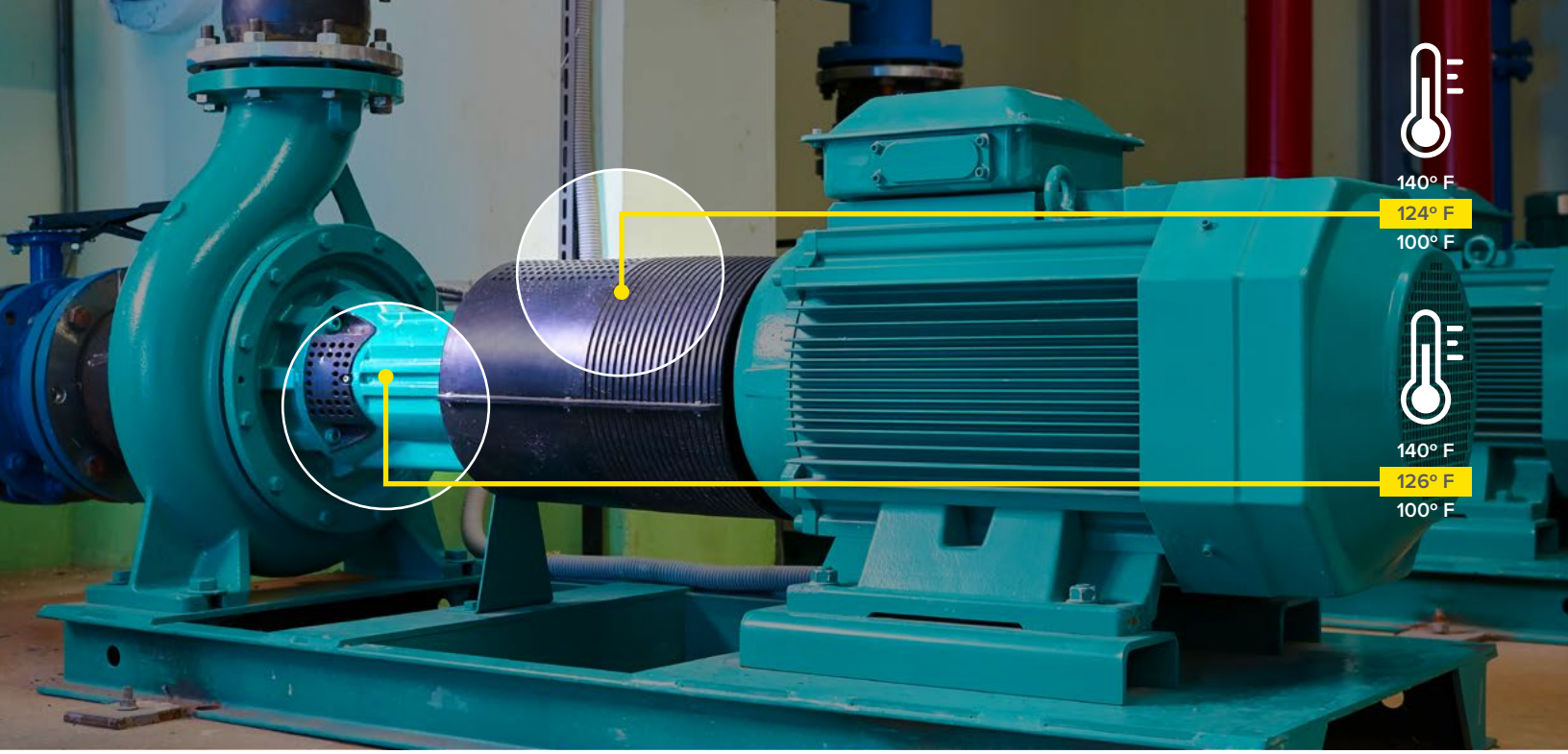
Snap Signal is a portfolio of modular IIoT hardware and software that converts existing sensor signals to a unified protocol and then brings the data to an edge device to monitor machine conditions in the cloud or distribute the data to a SCADA control system or PLC. Snap Signal products are easily deployable and deliver actionable machine data from across your factory floor. Snap Signal helps minimize disruptions when upgrading equipment. Your existing control system architecture remains unchanged. Alternative methods like upgrading your PLC typically require significant down time and present the possibility of problems upon re-commissioning, but that isn’t the case with Snap Signal.



3 Adding New Sensors to Unlock Additional Machine Data

During your assessment of existing devices, you may realize there are points you want to monitor that don't currently have sensors installed. For example, you may realize that monitoring the vibration and temperature of an electric motor could give you insights into when it may need service or replacement. You can quickly add a vibration & temperature sensor and connect it into the overlay network. This is a simple problem to solve using your new overlay network from Snap Signal, as there's no need to integrate these I/O points with your PLC.

> "Your existing control system architecture remains unchanged."



4 Simplifying Equipment Data with Unified Protocols

Industrial equipment and control systems often come with a variety of communication protocols, making it difficult to monitor existing equipment. The Snap Signal family of products unifies these into a single communication protocol allowing you access to existing device data and any new sensors you have added which you need to monitor.

Snap Signal makes this easy by offering a portfolio of in-line signal converters. These devices take signals like 0-10Vdc analog and convert them to a serial protocol. The converters require little to no configuration and install quickly via M12 connectors on either end. Building your overlay network involves identifying the signal types you have, so you can find the corresponding converters to capture the data and get it streaming. Once the signals are on a common serial protocol, you can bring them all together by creating cable networks with tees and M12 connectors.

The industrial controller moves the data to a location it can be consumed. Locations you might send data to include cloud dashboards, SCADA systems, and HMIs. Banner's Snap Signal IIoT portfolio includes a DXMR90 controller, which has the ability to connect to several serial networks and push data out via a single Industrial Ethernet port. The DXMR90 can perform logic, math, and other functions. Configurating the device is accomplished using Banner's free software, and scripting can be performed using MicroPython for even more advanced functionality.

5 Providing Your Organization with Actionable Data

Now that you have access to all this actionable data, here are 5 real-world applications where you can begin using it immediately:

1. Use sensor data to monitor the level of raw materials and schedule refills. Rather than having machine operators call in for more materials, let the machine tell the operators when they need to act. Use a cloud dashboard to view all the new data you have and create alerts when more materials are needed.
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2. Monitor Overall Equipment Effectiveness (OEE). Use sensor data from input, reject, and output lines, along with machine uptime, to provide insights by monitoring a cloud dashboard that can help identify machines which are performing well or poorly.
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3. Predict when hydraulic power units will need maintenance by monitoring a cloud dashboard containing vibration, temperature, and motor current data.
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4. Monitor tank levels remotely. Snap Signal products connect sensors of all signal types to bring tank level data onto your industrial network or to the cloud.
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5. Monitor the condition of dust collection systems. Monitor vibration and temperature, boiler temperatures, level, and differential pressure. Then bring this data to a Banner DXM and the option of aggregating in a cloud dashboard.
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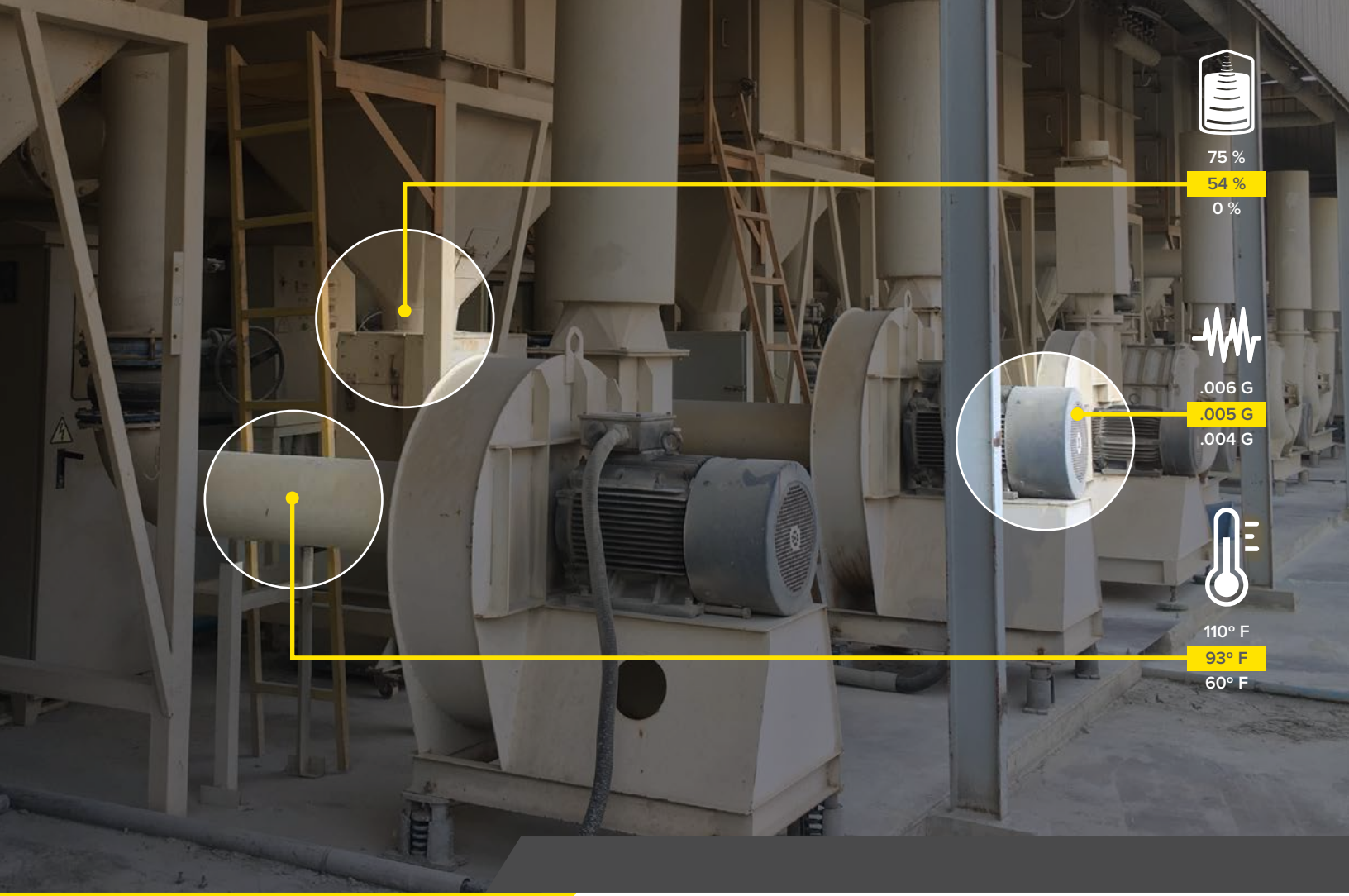

SNAP SIGNAL

The move to a smart factory – which was once a daunting prospect – has become easier with the use of Snap Signal products, from Banner Engineering. Snap Signal is brand-agnostic, and flexible enough to be implemented at any point along your data-flow chain and is an ideal solution for both modernizing legacy equipment and integrating with new machine builds. Increase productivity and unlock your factory's true potential with Snap Signal – a hardware and software tool-kit for your IIoT evolution. Banner products and solutions have been trusted for over 50 years and are designed and built to meet and exceed industry standards.

Visit snapsignal.bannerengineering.com to learn more about the products, contact an expert, or chat with an Engineer.

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