

# NED<sup>TM</sup>

## New Equipment Digest<sup>®</sup>

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**SPECIAL SECTION  
SMART TOOLS**



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# ▶ MASTERING REMOTE WORK

*Turning data into more than just visuals can help manufacturers improve, innovate, and stay ahead of the competition even when they're not on site.*

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### The 360° Revolution in Turning

CERATIZIT has developed High Dynamic Turning technology that, when combined with FreeTurn tooling, allows shops to carry out all traditional turning operations with just one tool.

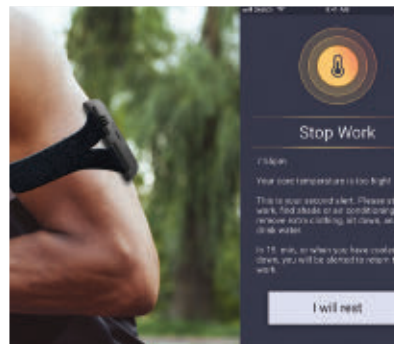
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### Deep Learning Vision

Providing an all-in-one solution for complex in-line inspection challenges, the In-Sight D900 self-learning vision system from Cognex Corporation tackles character recognition, assembly verification, and defect detection.

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### Get Ahead of Heat Injuries

Designed for all-day wear, Kenzen is a smart, wearable PPE patch that provides multiple physiological and environmental metrics to alert workers and supervisors of heat stress on the job.

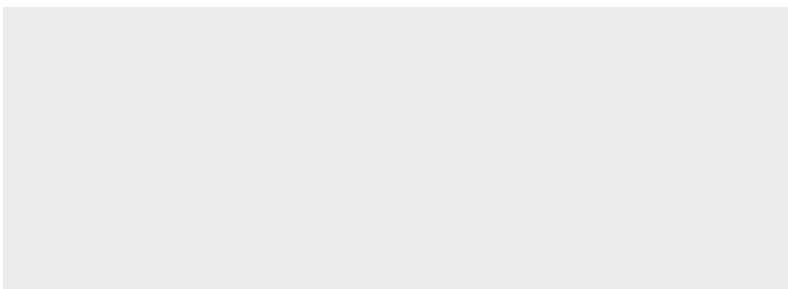
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### Enhance Depth and Perception

Eyes from OnRobot quickly and easily adds 2.5D vision to collaborative robotic applications with one-picture calibration, fast programming, and seamless gripper integration for sorting, picking, and placing unstructured applications.

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# Relays you can Rely on

to protect your motors and your budget



## Motor Protection Relays

AutomationDirect's ProSense® motor protection relays provide a cost-effective solution to monitor motor conditions and prevent costly failures and repairs.

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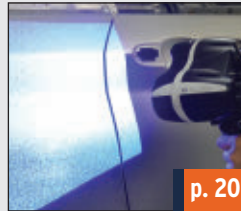


### PRODUCT SPOTLIGHTS



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Offering smooth operation, the Extendo 1056X telehandler from Pettibone provides a 10,000-lb. capacity capable of reaching lift heights of 56 ft.



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Hexagon's area scanner, RS-SQUARED, offers high-speed scanning of large, simple parts and surfaces with lower detail requirements.



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Designed for micro filing and polishing, Palmgren's Ultrasonic Finishing Tool can polish and deburr hard to reach, intricate parts.



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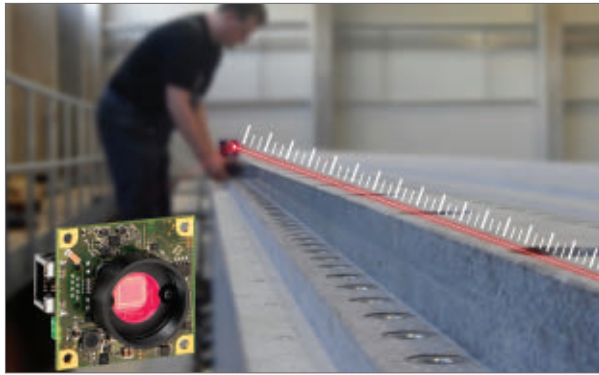
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The ELWI-GER 3000 optical alignment and measuring system offers 2-dimensional accurate and fast measurement of straightness and flatness with the help of uEye industrial cameras and is suitable for long lengths up to 100 m. The flexible system is suitable for technical surfaces, alignment, and control of linear guides as well as for curvature measurement on large components and rail systems. The system is controlled directly using a robust IP65-compatible tablet with intuitive touch screen—application and practice-oriented. Data transmission and remote control of the measuring system can also be done via smartphone. The system includes the measuring head as well as extensive accessories such as an adjustable holder, a measuring mirror, and an attachment laser as well as the corresponding USB connection to the display unit.

The system is controlled directly using a robust IP65-compatible tablet with intuitive touch screen—application and practice-oriented. Data transmission and remote control of the measuring system can also be done via smartphone. The system includes the measuring head as well as extensive accessories such as an adjustable holder, a measuring mirror, and an attachment laser as well as the corresponding USB connection to the display unit.

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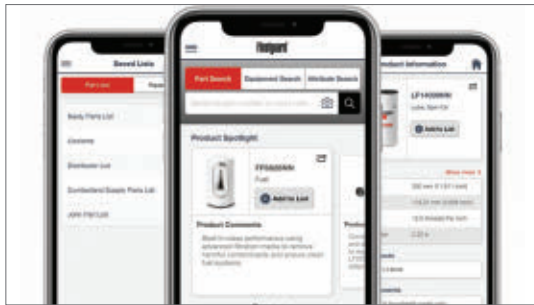


The Integrated Sensing Platform (ISP) is a valve sensing platform that reliably monitors valve position. With advanced capabilities in calibrating, operating, and communicating with diaphragm valves, the ISP provides customers a reduced piping footprint, shortened set up time, and simplified operation. Calibration of the device is fast and simple, whether using the external magnetic dongle or with the newly created ISP app. The ISP app will allow customers to remotely calibrate and operate their valves through a series of steps on an iPhone or iPad. The app offers users the ability to track valve performance over time and to log specific valve information and maintenance history. The information is easily accessed and reviewed via the app.

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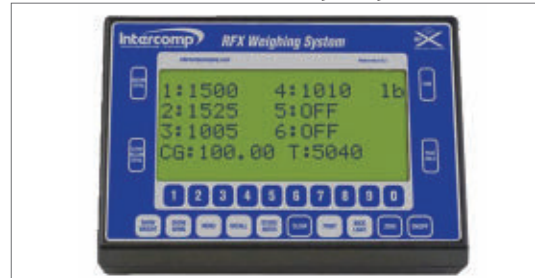


Fleetguard's app allows users to search for parts, create custom lists, share literature, and quickly find part numbers and details on thousands of Fleetguard products. Users can search by cross-reference, equipment type, attribute or by scanning a Fleetguard barcode.

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**Intercomp**

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**Wind Calculator for Roofing**



A comprehensive Wind Calculator for the commercial roofing industry determines the uplift requirements for a building's edge metal system. The calculator, available on the OMG Roofing App, is based on the latest IBC and ASCE standards. Specifiers, contractors, and end-users simply provide a few pieces of data for immediate project design pressure information.

**OMG Roofing Products**

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**Vibration Sensor Simplifies Asset Monitoring**



Performing prescriptive analytics on vibration data, the AMS Wireless Vibration Monitor is a vibration sensor that uses native software to automatically identify failure modes and prevent potential problems involving rotating assets. The compact device makes it economically feasible to fully monitor motors, pumps, fans, and other critical plant equipment to reduce downtime and achieve more reliable operations. Users of Emerson's Plantweb Optics asset performance platform can conveniently receive machinery health alerts anywhere with a mobile device.

**Emerson Automation Solutions**

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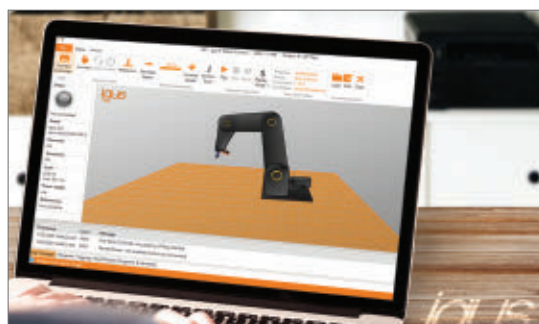


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**igus**

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**Hilti, Inc.**

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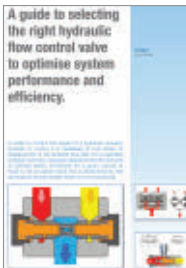


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# IMUs: The Lynchpin to the Future of Autonomous Vehicles

*An inertial measurement unit is the only sensing mechanism that is not affected or potentially rendered useless by external conditions, making them an essential technology for autonomous vehicles.*

By Tony Zarola

**A**utonomous vehicles are becoming a common sight in many industries and in consumer the world. From self-driving cars to automated guided vehicles to autonomous robots and machines, this technology is already proving it has tremendous value. However, with so much research and improvement needed for true widescale deployment, the future of this technology is still unclear.



Photo Credit: VanderWolfImages | Dreamstime.com

One of the biggest concerns surrounding this technology is its safety and reliability. Tony Zarola, general manager of Analog Devices (ADI) offers insight into what the future holds for autonomous vehicles and how sensors—specifically inertial measurement units—may play the biggest role in ensuring self-driving success.

## THE ROLE OF AN IMU IN AUTONOMOUS VEHICLES

Several modalities need to work in near-perfect synchrony to enable fully functional, fully autonomous machines. Among these modalities, perception technology such as radar, lidar, and cameras receive much of the credit for advancing the autonomous movement. However, the unsung hero, but critical lynchpin to an autonomous operation that these modalities hinge on—both in terms of image stabilization and vehicle navigation—is the inertial measurement unit or IMU.

IMUs are based on multi-axis combinations of precision gyroscopes, accelerometers, and in some cases magnetometers. This plug and play technology reliably senses and processes multiple degrees of freedom, even in highly complex applications and under dynamic conditions, providing a con-

sistent signal when other modalities are compromised. IMUs feature full factory calibration, embedded compensation, sensor processing, and a simple programmable interface.

Let's step back from full autonomy for a second and talk about something more immediate in terms of market pull. If you consider advancing autopilot, also known as hands-off driving, you may be surprised to learn that the critical specification is system latency. While it takes an IMU mere microseconds to update and output a relative measure of location, cameras, lidar, and radar take milliseconds—a lifetime when you consider highway speeds. Combined with environmental noise that causes perception blind spot, as the update rate continues to get longer, the fusion engine experiences information lags and gaps. It is during these critical “flying blind” moments that the machine receives and relies on the speedier data supplied by the IMU. Beyond that, IMUs are the only sensing mechanism not affected and potentially rendered useless, by external conditions. Adverse weather conditions, excess

heat or cold, wavelength restrictions, glare, and many other external factors can impede the reliability and functioning of other sensing modalities, making IMUs essential for situations when those situations arise.

## CHALLENGES IN THE INDUSTRY

Autonomous vehicles are an exciting extension of autonomous machines. However, while we've all been enamored by the concept, potential implications, and benefits of a driverless future, truly autonomous, personally owned cars are not yet technically or financially viable. Autonomous vehicles will impact the safety and lives of millions of people who use our roads on any given day, and there are vast, nuanced challenges that need to be overcome before the underlying technology can be introduced in non-controlled environments.

Although it is common to see vehicles that operate in a limited speed constrained autopilot mode and/or can self-park, the challenge ahead of us is to add speed without losing safety to get these semi-autonomous vehicles on roadways without relying on an alert driver. New technologies, including high-performance IMUs, will help expand the speed envelope. There are many other hurdles to over-

come, considering the system will have to account for an unconstrained environment and mapping the entire world—including every lamppost, streetlight, and stop sign, not to mention accounting for pedestrians and unpredictable encounters with wildlife—is a gargantuan task.

Original equipment manufacturers are faced with two options. They can advance existing technologies such as automatic emergency braking, valet parking, and autopilot, or invest in future technologies that seek to move the needle faster toward fully autonomous driving. However, ultimately, they need people to buy their vehicles, and considerable investments in technologies that make cars too expensive for the average consumer could result in a diminished or negative ROI.

## WHAT THE FUTURE WILL LOOK LIKE FOR IMUS IN AUTONOMOUS VEHICLES

Each sensing modality has its strengths and weaknesses, but by leveraging sensor fusion techniques, the strengths can complement one another, and the weaknesses can be supported. Cameras can get dirty and are susceptible to glare. Radar can be unable to pick up smaller objects or project a very clear image. Lidar is expensive and offers only limited usage in adverse weather conditions. And as noted earlier, all these modalities update more slowly than IMUs, with the time lag potentially creating a dangerous situation for occupants of the car and others on the road. These machines need trusted sensors and architectures, along with fail-safe back-up systems. In this endeavor, high-performance IMUs can take on the role of vehicle arbitrator to assist in guiding the vehicle when other sensing modalities fail.

The reason that IMUs work when all other modalities fail is their robustness to environmental impact. Beyond being unaffected by changes in temperature, IMUs, such as those from Analog Devices, feature vibration rejection, enabling the elimination of noise (such as vibrations generated by driving on rough roads) from the signal. Without this feature, vibrations from a moving vehicle would come through as a signal and affect the coordinates and direction, and therefore the safety of the car. This ability to reject conditions means the output of the sensor is uncompromised. Yes, a drawback of IMUs is the drift that is inherent in all gyroscopes, but with the right IMU that offers a greater degree of environment immunity, engineers can predict error growth, and incorporate that change into the algorithm to maintain the reliability of the IMU.

Ultimately, the future of autonomy comes down to reliability. What modalities will navigate this autonomous vehicle, drone or robot as quickly, safely, and efficiently as possible? What will be reliable when a split-second decision could be the difference between life and serious injury (or even death)? **NED**

For more, visit [newequipment.com/21129236](http://newequipment.com/21129236)



# A Step Ahead: Preventing Major Facility Interruption

Leading global tire maker, Hankook Tire, has developed a facility abnormality prediction system based on AI and IoT technologies to detect and predict production line abnormalities before they become a problem.

By Laura Davis

**P**reventative maintenance is a must in any facility to ensure shortened downtime and to reduce impacts to production timelines. While there is a vast amount of preventative maintenance technologies on the market, one company decided they needed more than a simple system to detect equipment failures.

New Equipment Digest spoke with Hankook Tire about its development of a condition monitoring system that incorporates AI and IoT technologies to improve its production efficiency at a rapid rate, as well as to accelerate the advancement of smart factories.



Photo Credit: Hankook Tire

**NEW EQUIPMENT DIGEST (NED):** What is the Hankook Condition Monitoring System Plus (CMS+) and what does it do?

**HANKOOK TIRE (HT):** CMS+ is a facility abnormality prediction system based on artificial intelligence (AI) and the Internet of Things (IoT) developed by Hankook. It will help us double-check abnormalities efficiently, allowing us to accelerate the development of smart factories.

The system collects various data in real-time on vibration, noise, temperature, etc. to predict any abnormalities. CMS+ studies the normal range data and finds those that are outside of that “normal range,” by using Hankook’s massive data collection that has accumulated over time. The AI system also studies fault data, which uses a collection of data we have from malfunctions, to determine abnormalities when similar cases show up. Different sensors in proximities collect data, which are then incorporated together for analysis. The CMS+ system consistently studies all data to create this algorithm.

In detail: The CMS+ uses a 3-step AI algorithm which proceeds through the next-generation wireless-based IoT module, gateway, and server. This enables data analysis with precise predictions three to four times greater than the existing system. During the first step that uses the IoT module, CMS+ collects and analyzes data every second, whereas the conventional method collected sensor data only at regular intervals. It was impossible to store the vast amounts of sensor data transmitted in real-time due to limitations in server capacity; however, the AI algorithm in next-generation wireless-based IoT module and gateway made it possible to automatically sort out and selectively store the data suspected of abnormalities.

**NED:** Does the introduction of AI and IoT remove the manual analysis of data by experts?

**HT:** No. While the system cuts down on having to sort through all the data, this step is not removed. The system will serve as an additional step for us to double-check, and the data will be collected for big data analysis, making data selection faster.

Hankook’s experts created the system and will still ultimately be the ones making the final call on any abnormalities. The system is serving to assist Hankook’s experts with their works. With over 4,000 sensors installed, the system analyzes the data to see if there are any immediate abnormalities, and then Hankook experts make the final call. Once our experts finish the data analysis, the AI system studies the algorithm set, which will allow the system to make a similar analysis like that of our experts in the future.

**NED:** How is this technology different from similar prediction maintenance systems already on the market? Why did Hankook decide to develop its own?

**HT:** One may say that our system is similar to those already out in the market. However, most of those systems do not have the data that ours has accumulated over time, thus not having the expert management applied in the system yet. Hankook was not looking for a mere sensor data system—we needed a system that collects and analyzes quality data. We also needed it to have Hankook’s unique expertise, which was why we decided to develop the system ourselves. Yes, such technologies can be developed by IT or Algorithm companies, but it will not be perfect. Data knowledge from all aspects needs to be accumulated and fused together. In Hankook Technology Group, we have experts in all areas such as manufacturing, IT, equipment, mechanics, etc. With help from the Korea Advanced Institute of Science and Technology (KAIST), we were able to create a system that best suited Hankook.

**NED:** How exactly has it helped Hankook’s productivity of production lines? What is the biggest change that has happened?

**HT:** CMS+, in short, predicts the possible abnormality, allowing us to fix the problem ahead of time, preventing possible utility malfunction. This saves time and energy as the maintenance needed can be executed with minimal loss in time. For example, we performed a test run with a utility that was up for maintenance and the system immediately found an equipment error, which was also confirmed by our experts. CMS+ will allow for double-checking of the system which will add reassurance in the analysis process and decrease the rate of doubts in oneself, helping our experts make efficient decisions on their reviews. **NED**

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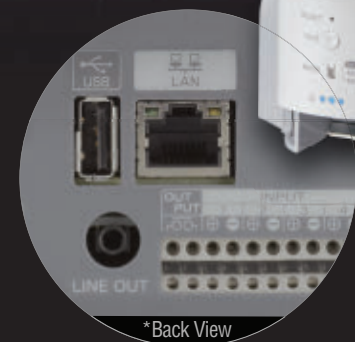
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TRAP

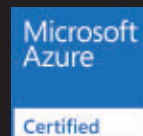
Socket Communication



NH-FV\*



\*Back View



Integrate devices not compatible with Azure Cloud using NH-FV

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# For Remote Work, Real-Time Data Monitoring Is Not Enough

*Turning data into more than just a visual can help manufacturers embrace remote work while continuously improving, innovating, and staying ahead of the competition.*

By Tyler Whitaker, CTO & COO, *Leading2Lean (L2L)*



Photo Credit: Getty Images

Three months ago, it would have defied common sense to hear the average productivity loss of remote work is 1%. It turns out, working from home works.

Cost savings for companies moving toward a more remote workforce are well over 1%, clearly a net gain. The movement toward remote work is not going to be reversed and will likely accelerate in the coming months. Just as the move to use offshore labor drove our current competitive markets. The move to reduce costs through remote work will be a pivot point for our industry moving forward. Are you ready to compete for new business and talent in this lower-cost environment?

Knowing the next new trend, several questions emerge: How do we manage factory operations in this new environ-

ment? Are we monitoring the right data? And how do we turn that data into continuous improvement, innovation, and competitive advantage?

## STEP 1: VISIBILITY

Whether working remotely from home or socially distanced inside the plant, the answer is much the same. If you do not have dashboards and metrics to provide visibility into your operations, then you won't have the understanding you need to manage and improve operations. Therefore, step 1 is establishing clear visibility to what really matters.

Three guidelines for what metrics to use:

1. Use Industry Standard Metrics with well-published formulas. Resist the temptation to tweak the calcu-

lations to fit your "view." This guards against hiding problems/opportunities within your plant.

2. Avoid Vanity Metrics with little direct impact on the business. What you measure gets improved. Choose metrics that improve the bottom line of the business.
3. Actively look for ways to game the system. If your metrics have loopholes, someone will try to exploit them.

The purpose of visibility is to know where your opportunities are to improve. But visibility is not the end game, and in fact, can prove to be a fool's errand for those that think "seeing" is enough. Unfortunately, merely seeing the problems on the shop floor doesn't solve the problems in question. Only directed and focused efforts will truly create the lasting improvement needed to survive in the next few years.



# The logical step towards effective automation is to digitize and optimize the lowest hanging fruit, which is the human workflow.

Although only the first step, having a system, like a Lean Execution System (LES), that provides this level of visibility is a necessary part of your foundation.

## The Machine Centric Fallacy

The industry, in general, has been fixated on Digital Manufacturing, Digital Transformation, Industry 4.0, Digital Twin, and other machine-centric approaches due in large part to the standardization of machine connectivity protocols such as Open Platform Communications (OPC) and OPC Unified Architecture (OPC-UA). A gold rush of Supervisory Control and Data Acquisition (SCADA), Manufacturing Execution System (MES), and IoT solutions has led to petabytes of Big Data. With the advent of Big Data, IT came to the quick realization that no human can ever hope to make sense of it all. Hence the rise of AI and Machine Learning.

But with ever-changing manufacturing methods and machine modifications, AI often fails to deliver on its promise due to the lack of context. "Is this signal I just detected due to a failing component of the machine, different raw material, machine modifications that now create different sensor data, or a host of other possible scenarios?" Unfortunately adding another sensor is the never-ending solution. "If we only had more data..."

## Does This Mean More Automation?

Does this argument for more data advocate for more automation? Unfortunately, the answer is both yes and no. More automation is good in areas where automation would make a difference. But automation is expensive and it causes its own problems. So, in today's market, where every dollar counts, you're forced to leverage your existing assets. We're finding manufacturers turning to their human operators as the most adaptable and versatile automation/sensor platform on the plant floor.

Digitizing plant floor work at a much lower cost than automation makes a lot of business sense. Based on your budget and your operating constraints, you may have a goal for a total lights out operation. The truth is, you're going to need a lot of human help over the next several years to get there. And you will need as much cost savings as you can to be able to pay for that automation. The logical step towards effective automation is to digitize and optimize the lowest hanging fruit, which is the human workflow.

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## Plant Floor Operation

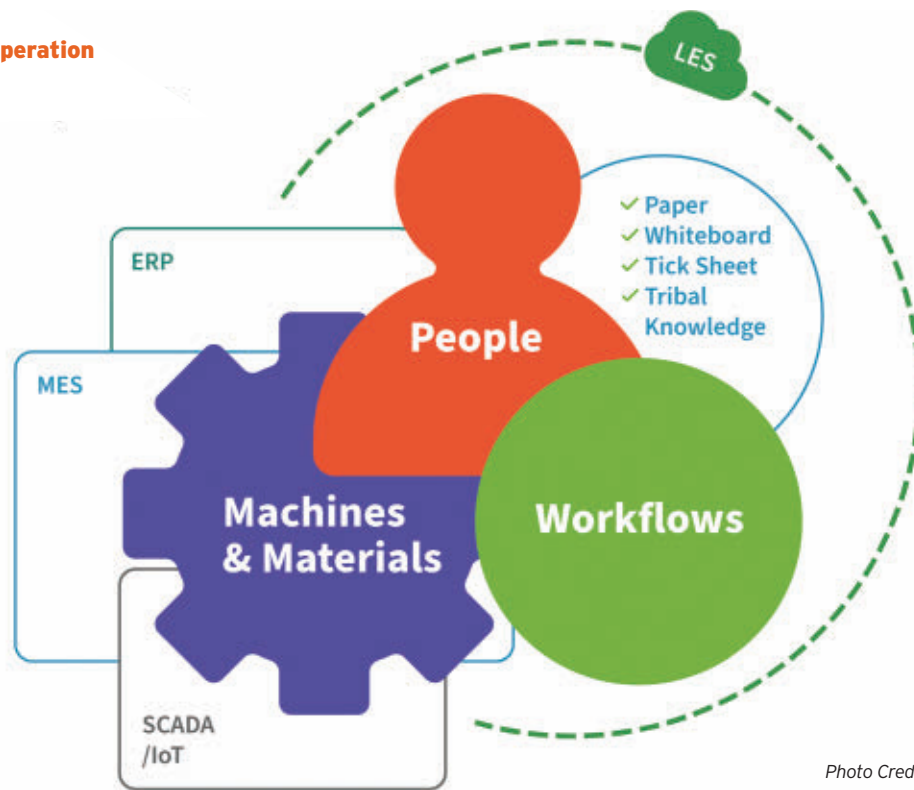


Photo Credit: Leading2Lean

## 2. THE NEXT REVOLUTION IS DIGITIZING ACTIONS

*Vision without action is a daydream. Action without vision is a nightmare. — Japanese Proverb*

Typical machine centered approaches miss the critical need for Digital Transformations on the people and process fronts. People are our most adaptable and capable sensor platform. They can detect problems on a dynamic shop floor in ways machine sensors will be hard-pressed. They know and are responsible for the ever-changing context the machine is operating within. They are especially critical when the problems are with non-machine related processes and procedures directing the manufacturing operations.

So, what about the processes that attempt to standardize the shop floor? They need a Digital Twin that is as adaptable and re-definable as they are. The speed at which standardized processes evolve and change is a fundamental factor in the pace of innovation. Get that wrong and it can lead to disaster. If process improvement doesn't keep pace with the changing environment on the plant floor, you will be perpetually solving the problems of yesterday, instead of today and tomorrow.

This critical need becomes more apparent as you get to high levels of Operational Availability (OA) where the machines aren't the problem anymore. The tell-tale symptom is when machine uptime is high and yet production numbers are still missing their targets. Recognizing there's still a gap between what the machine should have been able to produce versus what it did produce is the first step. That gap represents the failings of the other processes in the plant that are not machine-related. The questions then turn to support processes: Did we run out of material? Did we have a quality issue where the machine was running but found some other problem with the product or the raw material? Were we waiting for a Quality Inspector, to come out to resolve a questionable quality issue?

Ask any engineer if it's a machine or an operator problem. Chances are they'll tell you it's an operator problem. If that is true, then we need to wrap a system around the operators, and the rest of the plant, just like we do with the

machinery. When you look at the simple numbers, with one operator for every machine, then at least 50% of the movement on the plant floor is human. With our average customers, less than 10% of issues that happen on the plant floor are machine-related. The other 90% provides ample room for substantial improvement.

### Managing Actions and Reactions

Once you have remote monitoring capabilities in place, the next step in this evolution is to leverage the unique capabilities of a LES to provide real-time data monitoring

around the reactions to the metrics. How effective is your team at reacting and improving? This is the new frontier in digital transformation.

You'll be tempted to focus on more accuracy in your metrics. Like, whether our Overall Equipment Effectiveness (OEE) is 54% or 55%? It's hard to argue against getting the most accurate data you can, but it misses the big picture altogether. The real focus should be on what you can do to increase your OEE by 35 to 40 points. The only way to do that is by focusing on your reactions to the metrics and the underlying root causes. That's where true continuous improvement happens.

A good starting point would be to cut your reaction time, and measure how quickly you can solve downtime problems and get back on track. If you can't monitor and measure that reaction plan in real-time, then you'll never be able to achieve the gains that move the OEE needle. From a remote work perspective, this is a perfect time to start using a LES to change and adjust processes in a no-code, "citizen IT" manner. It's a game-changer when you can evolve those processes in real-time.

Again, monitoring equipment effectiveness isn't a problem, but do we have a system enabling us to monitor the people process effectiveness just as clearly?

### Using L2L's LES Platform to Enable Remote Work

Where typical plant floor systems are focused on machine monitoring, an LES platform enables you to monitor the bigger picture of the shop floor without omitting any details.

Two of the most eye-opening things for manufacturers that deploy L2L's LES are both the cumulative effect of small, innocuous problems on the overall health of the plant floor, and the previous disconnect between what is *perceived* as the largest problem to solve, and what they come to discover as the *actual* largest or most costly problem to solve. This level of real-time clarity around the problems and what's being done to solve them is where many manufacturers are finding their competitive edge, especially as they're forced to shift as much of their workforce to a remote-work model.

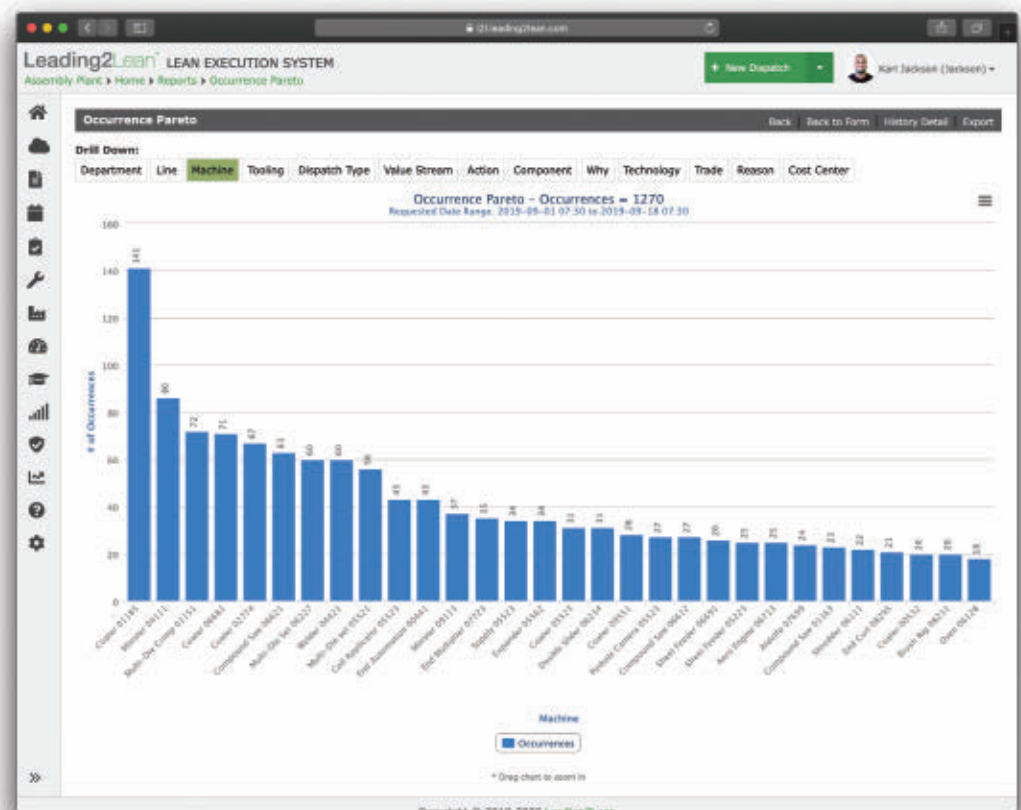


Photo Credit: Leading2Lean





Photo Credit: Leading2Lean

Consider two examples from recent interviews with companies using L2L's LES:

**IT Global MES Director—Tier 1 automotive supplier:** "In the cases where lines are running, L2L has played a critical role in allowing people to understand the performance of the production line while they've been away from the plant." "We use mobile devices to notify maintenance technicians, and we use operator workstations to interact with L2L's LES. And I think, because those capabilities have already been there,

we haven't had to train the workforce to do things differently. The social distancing has just come kind of naturally through that tool."

**CI Manager—Process manufacturing co:** "Maintenance and production are still on-site, but supervisors are able to react to escalation through L2L as opposed to being out on the floor all the time, which has sheltered them from interacting with people as much during this time." "Our maintenance team is still conducting their downtime meetings remotely,

and the fact that you have readily available reports you can run to see the status of an area or what's going on, and the escalation chain is built in, I don't think they've missed a beat. I haven't seen any degradation of maintenance support in the last few weeks."

Whether outside or inside the plant, clarity for managers around issues that impact production, and how those issues are being handled makes all the difference.

#### Why Not Get to Where You're Going Faster?

In the next 5-10 years, will a shift in digital increase or decrease? Overwhelmingly, the answer is increase. If that's true, then why not move there faster? The current crisis is accelerating movements that were already in the works (IT to OT convergence, IoT, Digital Transformation, etc.) The need to remotely monitor and influence operational success is not going away. It was there before and has only been intensified by COVID-19.

The current pandemic, despite all the disruption it has caused, has given companies a brief window to change direction, to innovate, and to prepare for the future. Nobody is forced to innovate when sales are up. The key is to embrace this acceleration to digitization, get ahead of the competition, and put yourself in the lead as the economy improves.

The next revolution is to digitize plant work done by your people. **NED**

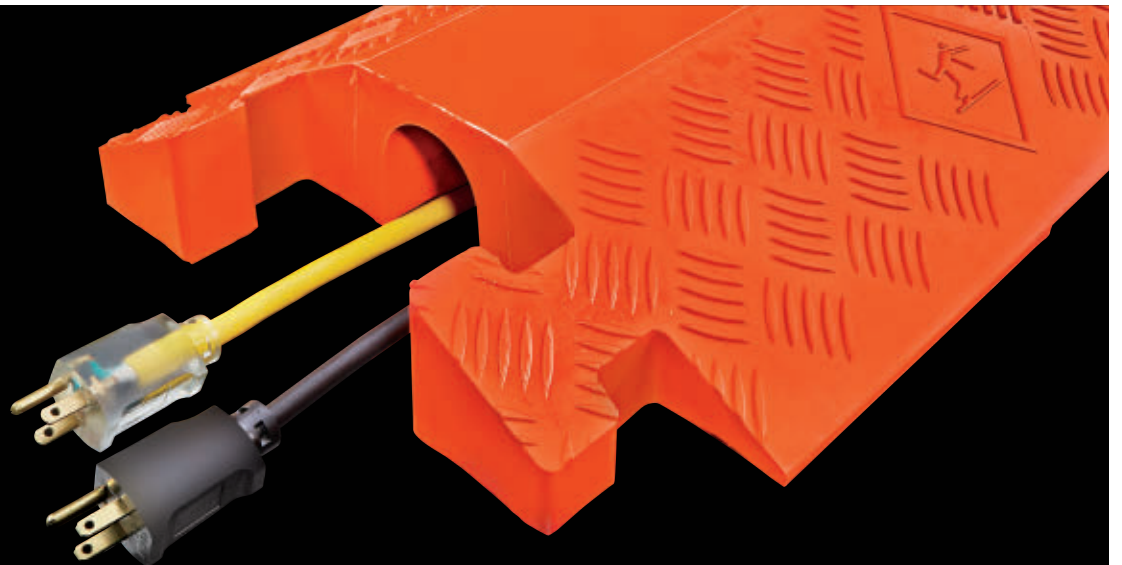
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As an added benefit, ONE-KEY provides the ability to track the saw drill with community tracking and alerts, complete inventory management, and industry leading smart-equipment technology to secure the user's investment.

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All micrometers incorporate a large 10 mm digit high contrast display, tolerance limits to qualify the part, a built-in reference system for setting zero position only once, and a "hold" function (digital lock) that allows measured values to be "frozen" so they can be easily read.

The micrometers are integrated with wireless data transmission capability to allow users to measure faster, more easily, and more reliably. Measurement data is transferred to an i-Stick on a computer without any interfering data cables.

### Mahr, Inc.

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## TOUGH ROTARY LASER

The 20V MAX Green Tough Rotary Laser features Bluetooth connectivity to connect to the Tool Connect app for approximate location tracking and receive bump, fall, and drop indications, as well as slope and line direction.

With an IP67 debris/water resistance, 1-m drop protection, and a highly visible green beam, the rotary laser performs in adverse jobsite conditions and provides an accuracy of +/- 1/16 in. at 100 ft. It has an interior range of 250 ft or an exterior range of 2,000 ft with the use of a detector.

The rotary laser comes standard in a DEWALT TSTAK Storage Case for additional convenience. Included with the 20V MAX Tool Connect Green Tough Rotary Laser is a 12V MAX/20V MAX charger, 20V MAX 2.0Ah battery, detector, ceiling bracket, laser enhancement glasses, target card, and remote control.

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The electronic shut-off mechanism provides precision tightening results and detects when the tool reaches the set target value and automatically shuts off the tool. The visual and audible indicators on the tool provide operators feedback of tightening abnormalities results during fastening.

The YZT's motor delivers 4,800 RPM of free speed and features torque ranges of 7-60 Nm on a hard joint.

**Ingersoll Rand**

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## HANDHELD ALLOY ANALYZERS

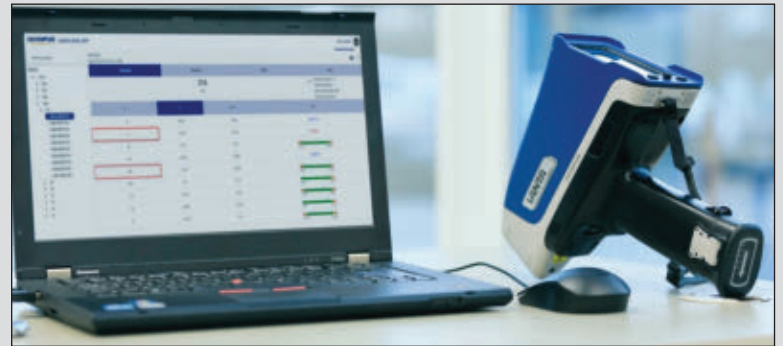
The Vanta analyzer is a handheld X-ray fluorescence (XRF) device that provides rapid, accurate element analysis and alloy identification to customers who demand laboratory-quality results in the field.

With intuitive navigation and configurable software, the Vanta is easy to use with minimal training for high throughput and a fast return on investment. Featuring innovative and proprietary Axon technology, Vanta analyzers give accurate results and help boost productivity no matter the environment or working conditions.

The Olympus Data Viewer app for Vanta handheld XRF analyzers provides Olympus Scientific Cloud users with a central location to remotely view and share real-time analysis results from multiple analyzers. Operators can use the app to remotely view data and test results from their Vanta analyzers located across the world. Users can view analysis results, including the spectra and chemistry, as well as the instrument location. For greater ease of use, the app enables users to filter results by date and serial number.

**Olympus**

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## OPTICAL REBOUND HAMMER

The Silver Schmidt OS8200 rebound hammer is as accurate, reliable, and versatile as ever—and now connected thanks to its optical measurement technology paired with digital productivity features and a user-friendly mobile app.

With the Schmidt Live mobile app, users can apply corrections for carbonation, form factors, and generate visual reports using bar charts, lists, and statistics. The app records measurements and supports instant reporting and information sharing between users.

The patented optical technology delivers compressive strength measurements with a higher range and far lower dispersion than any classical rebound hammer and the versatile connectivity increases operator productivity and makes instantaneous reporting possible, from anywhere, anytime.

**Proceq USA, Inc.**

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## FROM THE COVER

### Revolutionary Turning Technology

completes turning operations with one tool



High Dynamic Turning (HDT) has turned conventional turning methods in a new direction. This turning technology, combined with the dynamic FreeTurn tooling, means that it is now possible to carry out all traditional turning operations such as roughing, finishing, contour turning, face turning, and longitudinal turning with just one tool. The simple idea behind HDT: the tool approach and point of contact in the machine can be varied as opposed to conventional turning with a fixed tool.

Instead of the classic, static position of the insert in the holder, the milling spindle is now used to produce the corresponding approach angle to the workpiece. The use of the spindle drive, in conjunction with the slim, axial tool design of the FreeTurn tools creates a degree of freedom of 360-deg. without the risk of collision, providing unprecedented flexibility. Due to the rotation around its own tool axis, the cutting edge change can be done without interrupting the cutting process. Additionally, the angle of approach is freely variable at any time and can even be changed while cutting. This not only enables flexible machining of almost every workpiece contour but also optimum chip breaking, higher feed rates, and an increase in tool life.

**CERATIZIT**

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### Ultra-Low Temperature Elastomer

features an operating temperature range of -70 to 450°F



Fusion FKM 665, a new generation, ultra-low-temperature and chemical-resistant elastomer, is specifically formulated to meet and exceed the requirements of Aerospace Material Specification (AMS) 7379 and AMS-P-83461. With a temperature range of -70 to 450°F, Fusion 665 achieves outstanding low-temperature performance without compromising high-temperature performance. It was developed to overcome existing limitations of comparable materials, such as those found in FKMs, NBRs, or FVMQs/Fluorosilicone, by offering high-temperature capabilities, low and high-temperature sealing, an extremely low compression set, and broad chemical compatibility.

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### Compact Power-Over-Ethernet Switch

eliminates Ethernet and power cables



Just two inches wide and four inches tall, the 852-1411/000-001 PoE switch is ideal for all applications with limited space. The wide voltage input of 24 to 57 VDC, makes the switch a great option for all PoE applications. It supports both PoE operation modes A and B, with all of the ports supporting 10/100/1000 Mbps/s. This economy PoE+ switch is unmanaged, supplies 30 W of power per PoE port, and has an operating temperature of -10 to +60°C. It eliminates the need to run both Ethernet and power cables to end devices, ultimately reducing cost.

**WAGO**

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### Shutable Trailer Stand

is completely hands-free



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can upload results through its Bluetooth interface



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easier access for measuring specific gravity in battery cells that are located in tight and hard-to-reach areas.

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## High-Speed Vertical Machining Centers

allow an increased depth of cut



Offering users higher productivity, robustness, and precision, Romi D Series vertical machining centers are built with monoblock cast iron beds that absorb vibration and allow consistent production of highly precise parts. All models are fitted with big-bore, 40-tape r, direct-drive spindles with speeds of 10,000 or 15,000 rpm.

**Romi Machine Tools Ltd**

MORE ONLINE: [nedinfo.com/76476-42](http://nedinfo.com/76476-42)

## Bonding and Sealing Epoxy

bonds well to a wide array of substrates



A two-part epoxy system for bonding and sealing applications, EP35SP provides resistance to many chemicals such as oils, acids, bases, water, fuels, and petrochemicals. It features both a high glass transition temperature and a broad service temperature range. EP35SP has a paste viscosity, with little to no flow, and can be applied on vertical surfaces.

**Master Bond Inc.**

MORE ONLINE: [nedinfo.com/76476-43](http://nedinfo.com/76476-43)

## Quarter-Turn Fastener for Tight Spaces

prevents damage caused by over tightening



The DZUS D9-52 Tech Line Quarter-Turn Fastener features a small head diameter allowing it to be installed in tight spaces and easily accessed via hand or tool actuation. It features a captive, spring-loaded design that provides accurate, secure engagement and vibration resistance while helping to prevent damage caused by over-tightening.

**Southco, Inc.**

MORE ONLINE: [nedinfo.com/76476-44](http://nedinfo.com/76476-44)

## Controller for Brushless DC Motors

controls every zone in the conveyor system



ConveyLink gives users in-depth control of virtually every possible motor-driven roller application in use today. Out of the box, it functions as a zero-pressure accumulation controller by connecting two drive motors, two sensors, supplementary I/O, and a standard Cat 5 shielded Ethernet cable to the next downstream card. It can be connected to most major brand PLC's using ProfiNet, Modbus, or EthernetIP with all required support files available for download on the PULSEROLLER website. Once a PLC is connected, ConveyLink can be configured to take control over every zone in the conveyor system. Users can quickly commission and configure their ConveyLink controlled system with the push of a button. Changes and updates to the configuration can be made using Easy-Roll, a free software program from PULSEROLLER.

**PULSEROLLER**

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## Telehandler Delivers Greater Control

reaches a maximum lift height of 56 ft.



The latest edition to the X-Series lineup, the Extendo 1056X telehandler provides a 10,000-lb. capacity capable of reaching lift heights of 56 ft. Featuring a four-section boom, the 1056X delivers max forward reach of 40 ft and the boom structure's formed plates offer greater strength while reducing weight. The design also minimizes boom deflection for better control and accuracy when placing loads. Abundant boom overlap provides smooth operation and reduces contact forces on wear

pads, extending service life. A bottom-mounted external extend cylinder further reduces the load on wear pads by up to 50%.

**Pettibone/Traverse Lift, LLC**

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## Ultrasonic Transducer Enhances Flow Meters

provides a barrier from corrosive hydrocarbon fluids



Daniel T-200, a titanium-housed transducer, marks the first use of metal 3D printing to enhance the acoustic performance of ultrasonic flow meters in custody transfer applications. The T-200's design provides increased reliability, uptime, and safety while achieving the highest accuracy class attainable in gas measurement. To boost signal strength through the titanium housing, it uses a metal 3D-printed mini horn array that acts as a harmonic oscillator and matching layer. This maximizes the sound energy coupled into the gas, improving the signal-to-noise ratio and accuracy of the measurement.

**Emerson Electric Co.**

MORE ONLINE: [nedinfo.com/76476-47](http://nedinfo.com/76476-47)

## Robotic Dispensing System

handles payloads up to 100 lb.



Streamline production with the palletized RP2415 Series Production Robot which automates the 4 component assembly with PD-2 positive displacement twin fill nozzle, dual assembly heads, and a 3 gallon pressure

pot. Embedded dual memory processor with CF Card requires no PC for operation, and provides all preprogrammed software functions for filling, assembly, positioning, etc., making changing over to different volumes or positions as easy as just loading a new file.

**Dispense Works Inc.**

MORE ONLINE: [nedinfo.com/76476-48](http://nedinfo.com/76476-48)

## Compact Diode Laser Provides the Power

offers a power output of 1 to 4 kW



The HighLight DL HPS is an industrial diode laser that offers high power output in a compact, self-contained package, making it useful in metal cladding, heat treating, brazing, and welding. The HighLight DL HPS uses an "all-in-one" configuration, meaning that the laser head, power supply, water chiller, and heat exchanger are all contained in a single

enclosure. Another significant advantage is that its conduction-cooled laser diodes enable the closed-loop chiller to use distilled water.

**Coherent, Inc.**

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## Flexible, Electrical Conduit Protection

reduces the risk of smoke and fire spread

Providing high-quality data center protection solutions, Liquatite offers physical protection to wires and cables; conduit colors that identify critical circuitry; UL listed and CSA certified varieties; halogen-free, low fire hazard solution types; and even Power Distribution Assembly Whips.

**Electri-Flex Company**

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## Low Cost Monitor for Welding

warms up in under 60 seconds



PurgEye Nano is ideal for welding titanium and high end stainless steel, where oxygen levels are required to be as low as 10 ppm. With leak-tight connectors for weld purge hoses, the lightweight PurgEye Nano can be used with

an optional accessory hand pump and gas sampling probe. The PurgEye Nano has been developed for weld purging where data logging, alarms, and machine control are not necessarily required. The monitor has been developed with a unique long life sensor that has a warm up time of 60 seconds or less.

**Huntingdon Fusion Techniques HFT**

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## Eco-Friendly Recirculating Chillers

offer quiet operation with maximum uptime



For precise temperature control of analytical, medical, and industrial equipment, the Nextreme Recirculating Chiller platform features high-quality components, environmentally friendly refrigerants, low-noise components, and a user-friendly operator interface. The chiller uses high-performance variable speed motors for noise reduction, lower room heat input, and reduced energy consumption by up to 50% compared to conventional compressor-based systems. The platform is designed with a semi-open coolant system which offers several advantages including decreased bacterial growth and evaporation while still being easy to maintain.

**Laird Thermal Systems**

MORE ONLINE: [nedinfo.com/76476-52](http://nedinfo.com/76476-52)



## Hands-Free Door Opener

can be used on metal or wood doors



In response to the Coronavirus pandemic, the Arm-Pull is a hands-free door opener that allows users to open swing-style doors without using their hands or fingertips. The Arm-Pull attaches to latch-less, swing-style doors and allows people to pull

the door open using their forearm, wrist or elbow when entering or exiting a room.

**Industrial Magnetics, Inc.**

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## No Drip Spray Nozzles

clean and cool while conserving liquid



1/2 NPT No Drip External Mix Air Atomizing Spray Nozzles work in the same way standard atomizing nozzles do, but have the added benefit of positively stopping liquid flow when compressed air is shut off. The nozzles have the highest flow rates and allow the air and liquid flow to be adjusted independently.

They can be used on liquids above 300 centipoise. The patented No Drip design requires no additional airline to control the No Drip feature.

**EXAIR Corporation**

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## Level Switch Adapts to Any Medium

features an optional 4 to 20 mA analog signal



Thanks to the level switch PL20, the CleverLevel series offers more possibilities for detecting point levels. CleverLevel reliably detects every type of medium, whether liquid, pasty, viscous, or solid, and is the solution for a variety of applications for which standard vibrating forks are used today. The self-learning sensor automatically adjusts to different media to ensure maximum flexibility with minimum set-up times.

**The Baumer Group**

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## High-Torque, Low-Speed Dynamometers

provide up to 300 torque changes per minute



Force Control dynamometers featuring Positorq Oil Shear Load Brakes absorb extreme torque at very low speed (down to zero rpm), so that they can accurately capture data at critical junctures, when dynamometers equipped with traditional load brakes cannot. Quick, controllable response

allows virtually unlimited test capabilities, while their extremely quiet operation allows gearbox, transmission, or final drive noise testing.

**Force Control Industries**

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## Oil Level Indicator

has a maximum operating temperature of up to 80°C



The ELESA ATEX line has been enlarged with the HFTX-EX oil level indicator in transparent technopolymer with an anodized aluminum star-shaped contrast screen. It is characterized by a magnifying lens with a

particular shape to increase and improve visibility, even from side positions. The indicator is designed for applications in potentially explosive atmospheres in pneumatic, hydraulic, electrical, and mechanical systems.

**ELESA**

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## Shaft Adapters Offer Unlimited Compatibility

accommodate shafts from 0.5 to 2.0-in. I.D.



Stafford Machinable Shaft-End Adapters come in three configurations where the female clamps onto the shaft end: one has a machinable male, one has a full diameter customizable end, and another has a flange style end. All are offered in aluminum, steel, and stainless steel to accommodate shafts from

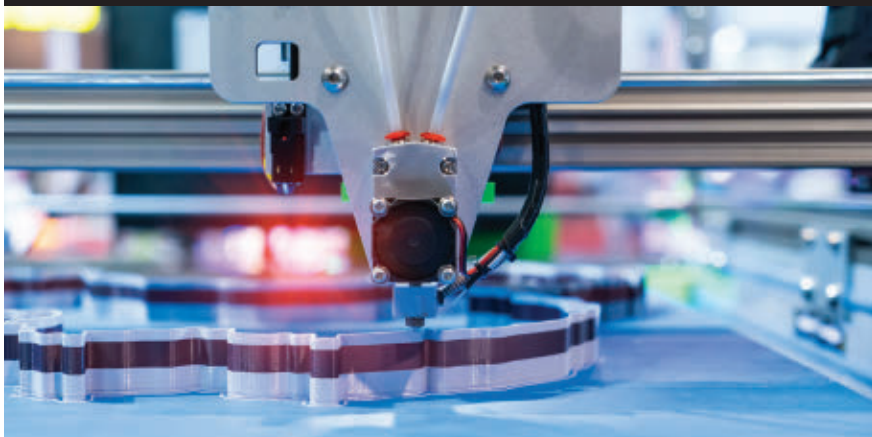
0.5 to 2.0-in. I.D. and provide a range of inch and metric output ends.

**Stafford Manufacturing Corp.**

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## FROM THE COVER

### Deep Learning Smart Camera

*deciphers deformed etched codes*



Providing an all-in-one solution for complex in-line inspection challenges, the In-Sight D900 embedded vision system features Cognex's ViDi deep learning software inside an In-Sight industrial-grade smart camera. The self-contained system is designed to solve a broad range of complex in-line inspection applications including optical character recognition (OCR), assembly verification, and defect detection.

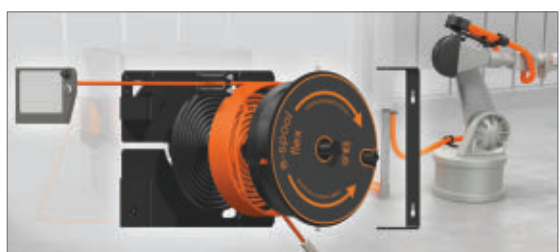
Combining the self-learning ability of a human inspector with the robustness and consistency of a vision system, the In-Sight D900 expands the limits of what can be inspected in factory automation. The system, which can be set up using a small number of image samples, leverages Cognex's familiar and easy-to-use spreadsheet platform and does not require a PC or deep learning expertise to deploy.

The In-Sight ViDi Read tool works right out of the box, dramatically reducing development time, thanks to the deep learning pre-trained font library. Simply define the region of interest and set the character size.

The In-Sight D900 is ideal for automating complex inspection applications across a range of industries including automotive, consumer electronics, consumer products, packaging, food and beverage, medical devices, and logistics.

**Cognex Corporation**

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### Increase Safety With Cable Reel

*allows cables to move flexibly in free use*

Guide cables and hoses for the transmission of energy, media, and data without interruption with the e-spool flex. For quick installation of the cable reel, the developers opted for a worm guide; the cable is inserted in a few simple steps and the e-spool is ready for use. The cable winder does not require a slip ring, so bus cables and hoses can also be guided without interruption.

**igus Inc.**

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### Compact Scudding Machines

*speed up machining processes with twin-spindle design*



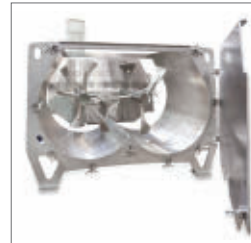
The Proficator S-Type is a modularly designed, vertical, single spindle pick-up gear cutting machine. Machines in the S Series are better than broaching and most applications feature a dry machining process. All machine components are designed for especially high static stiffness and optimal dynamic behavior. Furthermore, the machine's twin spindle arrangement speeds up the process considerably. S-type machines are available in three sizes: Proficator S-150, Proficator S-250, and Proficator S-500. Proficator S-150 has a part diameter up to 150 mm, while Proficator S-250 and S-500 have a part diameter up to 250 and 500 mm, respectively.

**German Machine Tools of America (GMTA)**

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### Batch Mixers Prevent Cross-Contamination

*support fast, frequent recipe changes*



Multiflux GMS mixers promote fast cleaning, ensure product purity, and minimize risk of batch-to-batch cross-contamination. Allowing frequent recipe changes with less downtime, the mixers offer an oversized

entry door that seals the entire front of the mixer during operation and then fully opens with no tools to invite safe, easy access to the inside for a thorough cleaning of the mixing chamber. Full access to the discharge openings and inlet flanges help block bacterial growth and offer additional assurance of cleanliness.

**Gericke USA, Inc.**

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### Vacuum Pump Inlet Traps

*prevent premature failure in research labs*



MV PosiTrap Vacuum Inlet Traps come in 4 and 8-in. dia. sizes for pumps up to 25 and 50 CFM, respectively, and are designed to prevent contaminants from being ingested in the pump; causing premature pump failure. The inlet traps that protect pumps from the byproducts generat-

ed by freeze dryers, gel dryers, rotary evaporators, vacuum ovens, glove boxes, and vacuum sterilizers.

**Mass-Vac, Inc.**

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### High-Force Electric Actuators

*are rated up to 50,000 lb. of force*



The extreme-force electric actuator family now includes the RSX128 actuator, rated up to 50,000 lb. of force. Ideal for replacing hydraulic cylinders and designed for 100% duty cycle, the RSX actuator features Tolomatic's precision-ground planetary roller screws for long, consistent operating life in challenging environments. Applications include assembly, metal fabrication (pressing, punching, clamping), automotive manufacturing, timber processing, motion simulators, and more.

**Tolomatic**

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### Gravity Roof Ventilators

*resist harsh weather conditions*



GIV Gravity Operated Roof Ventilators intake fresh air using the pressure difference between the outside and inside air. The throat and hood design allows for high volumes of fresh air intake while minimizing the induced pressure drop. GIV ventilators offer square and rectangular throat areas, with throat lengths ranging from 12 to 120 in.

**Continental Fan Manufacturing Inc.**

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## Digital Gauge Measurement

provides reliable basic measurement of 1D values



With its rugged design, the shop-floor hardened GAGE-CHEK 2000 evaluation electronics box is well suited for positioning tasks on many applications, from typical measuring rooms to a harsh production environment. Offered as a plug-and-play embedded system, this solid metrology unit provides reliable basic measurement of 1D values. Built on HEIDENHAIN's DRO software and hardware, it offers a simple-to-view readout and up to 3-axis inputs. Its slim aluminum housing with integrated power adapter and fanless passive cooling system is exceptionally sturdy and resilient. The touch screen is made of hardened glass and supports multi-touch gesture control, including permitting operation with gloves. The logical arrangement of menus and elements provides intuitive user guidance in the use of various functions.

**HEIDENHAIN GmbH**

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## Cantilevered Production Cart

holds both large and complex parts

The cantilevered cart features arms that can be used as shelves for ergonomic presentation and to support long parts and parts that feature large internal openings. The arms of the cart are designed to extend in order to secure transport of the part, while eliminating the need for ancillary packaging.

**Creform Corporation**

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## High-Airflow, Outdoor Fan

operates in a broad range of weather conditions



Certified to TYPE 3R, the Outdoor Filterfan is a rain-proof filter fan with an unrivaled airflow suitable for outdoor weather conditions, making a rainhood unnecessary for most applications. The fan reaches high airflow with flow optimized fins and rotor blades.

The fluted filter-mat provides 3x longer service life by holding more dust before airflow is impeded, extending the mean time between maintenance for outdoor enclosures. It provides electrical enclosures with protection against falling dirt, harmful effects of rain, sleet, snow, and external ice formation.

**Pfannenberg, Inc.**

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## Anti-Vibration Boring Bar

features vibration damping technology for max precision



Unlike conventional steel or solid carbide boring bars that are often ineffective at length/diameter ratios beyond 6 x Dc, the Accure-tec A3000, with its patented vibration dampening system, excels at length/diameter ratios beyond 6 x Dc—the point where those conventional steel or solid carbide boring bars often prove less efficient. The boring bars feature compact, robust QuadFit precision quick-change exchangeable heads which boost versatility and decrease downtime.

**Walter USA, LLC**

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## Ultra Furnace for Dry Processing Market

can batch process up to 100, 12-in. wafers



Ultra Furnace, a system developed for multiple dry processing applications, delivers high performance for low-pressure chemical vapor deposition, oxidation and annealing processes, as well as for atomic layer deposition. The Ultra Furnace system is intended for batch processing of up to 100, 12-in.

wafers. The innovative system design combines newly developed hardware that improves durability, with the company's proven software technology and a proprietary control system and algorithm. This enables the tool to provide stable control of pressure, gas flow rate, and temperature.

**ACM Research, Inc.**

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## New Equipment Digest

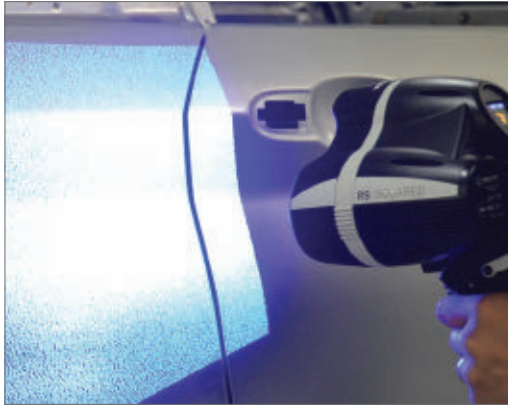
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### 3D Scanner Takes on Large, High-Speed Scanning Applications

digitalizes scans within in 10 minutes



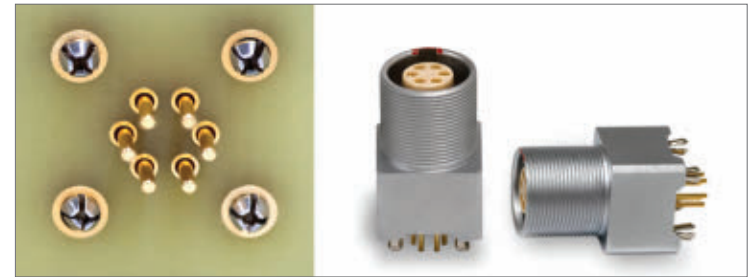
Allowing users to perform high-speed scans of simple shapes and surfaces, the RS-SQUARED area scanner is best suited to the scanning of large parts with lower detail requirements, such as automotive parts. RS-SQUARED is a white light scanner that uses the Absolute Arm system to position large square tiles of 3D scan data. This removes the need for time-consuming application of reference markers or spray, or complex mechanical processes such as fringe projection that requires a stable environment. Up to 4 data tiles are captured every second, which combined with minimal set-up time, creates a scanning system capable of generating point cloud data in very little time. As with other Absolute Arm scanners, the RS-SQUARED can be easily removed and remounted without needing time-consuming recalibration processes due to an innovative repeatable mounting system.

**Hexagon Manufacturing Intelligence**

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### Press-Fit Contacts for PCB Sockets

work with 1.6-mm thickness boards



Harpoon earthing pins enable easy pre-installing of various receptacles/socket. The advantage of these press-fit contacts is the gain of time while doing the pre-assembly; simply align the connector and push firmly. This pre-assembly will enable the users to turn the PCB board upside down and run the parts through the reflow soldering oven. This solution is planned for elbow and straight PCB sockets of OB and IB series. The current design works specifically with 1.6 mm thickness boards.

**LEMO SA**

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### Two-Component Dosing Cell

is designed for output quantities of 0.5 to 5.0 g/s



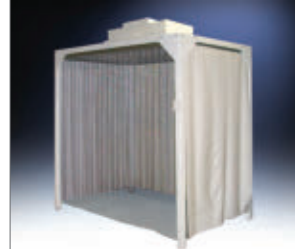
The compact Sonderhoff 3E dosing cell processes liquid, medium, and high-viscosity polyurethanes or other polymer reactive materials. Using the Formed-In-Place technology, 2-component sealing foams, adhesives or potting compounds are directly applied onto the part, precisely and freely programmable, with the CNC-controlled mixing head.

**Henkel AG & Co. KGaA**

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### Mobile Clean Rooms

operate on 115 or 220v power



Softwall Clean Rooms are designed to meet ISO 5 - ISO 8 requirements and feature a flexible design that allows them to locate over and around equipment, with the option of being mobile with casters. The structural framework is of aircraft anodized aluminum with clear vinyl curtains around the unit. The curtains can be strips or solid depending on restriction of access in clear or opaque white vinyl. A fan powered HEPA filter and fluorescent lighting modules along with blank ceiling tiles are positioned into a ceiling grid system and optional entry airlocks can be incorporated into the design.

**HEMCO Corporation**

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### Intelligence and Analytics Platform

can make any sensor on a machine intelligent  
Sciemetric EDGE delivers a universal platform to control a variety of manufacturing and industrial processes. Consisting of configurable modules and software, the distributed analytics system removes barriers to continuous process monitoring for productivity improvements and cost savings.

**Sciemetric Instruments Inc.**

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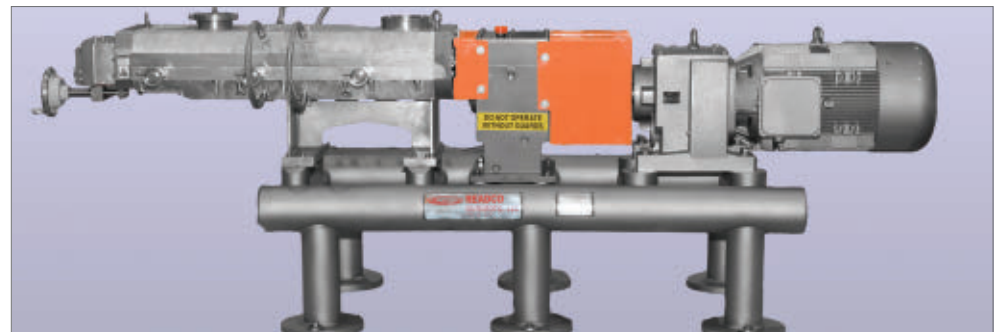
### Compressors With Variable Frequency Drives

offer 50 and 60 HP respectively

With the advanced SynRM motor-drive combination, the SFC 37 and SFC 45S deliver flows from 54 to 275 cfm at 125 psig with superior part-load efficiency, longer service life, and reduced maintenance costs. The available pressure range is 80-217 psig.

**Kaeser Compressors, Inc.**

MORE ONLINE: [nedinfo.com/76476-76](http://nedinfo.com/76476-76)



### Continuous Processors Run on Empty

automatically empty 95% of product for fast cleaning

Readco's Continuous Processors feature a proprietary power transmission design and bearing configuration that allow safe operation while running on empty. The processor automatically prevents the mixing elements from contacting the barrel and eliminate risk of contamination from metal to metal contact to allow safe startup without any material in the process.

**Readco Kurimoto, LLC**

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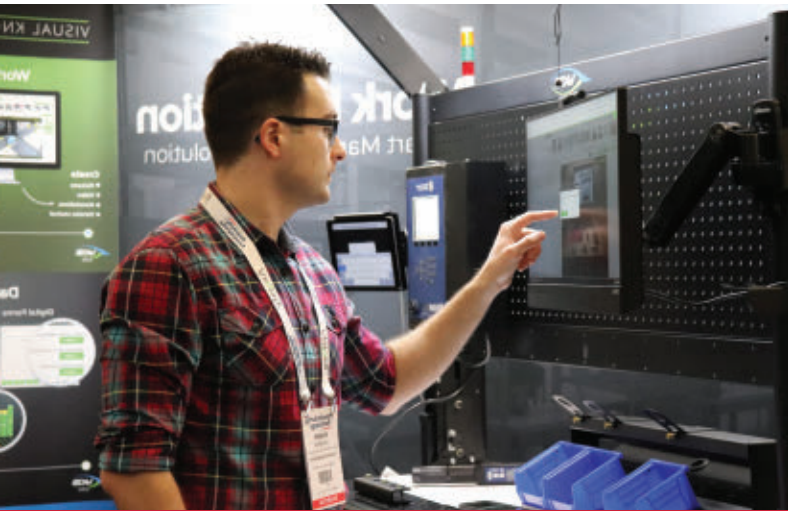
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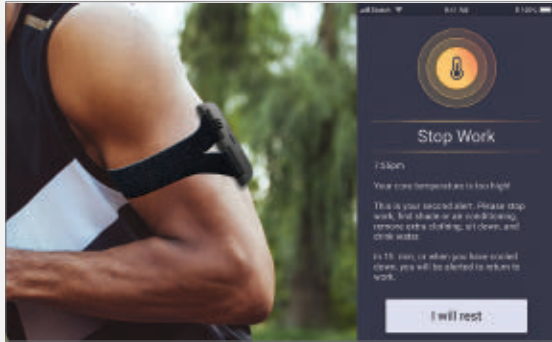
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## FROM THE COVER

### Smart PPE Prevents Heat Injuries

monitors and relays real-time stress indicators



Kenzen is a smart PPE patch that focuses on physiological monitoring and the prevention of heat injury and death among workers. The real-time worker heat monitoring system is a cloud-based SaaS system that includes a wearable device worn by workers on their arm which alerts both the worker and their supervisor when core body temperature is too high.

The wearable, via its advanced sensor complement, monitors multiple physiological and environmental metrics, including heart rate, activity, skin, and ambient temperatures. Together, this sensor data allows for the real-time prediction of core body temperature, providing alerts to workers and supervisors when temperatures approach unsafe levels.

Kenzen's multi-level alerts are sent to workers via device vibration, iOS or Android app notification, and to supervisors via web dashboard alert signaling that the worker should take a break and allow his/her temperature to return to safe levels. Alerts are accompanied by actionable recommendations such as advising the worker to take a break, find shade, drink water, or remove any excess clothing and equipment to decrease body heat. A second "back to work" alert then indicates when the worker's core body temperature has returned to a safe level.

**Kenzen, Inc.**

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### Labelstocks for Harsh Environments

are resistant to edge-lifting even when repeatedly subjected to changes

Designed for temperatures as low as -320°F, cryogenic labelstocks are intended for harsh environment applications where labels must withstand exposure to liquid nitrogen or ultra-low temperature freezers, thaw cycles, chemicals, and solvents. Intended for use in medical research, clinical laboratories, and biobanks, the labelstocks are used for labeling laboratory identification substrates, such as test tubes, ampules, vials, slides, and more.

**Mactac**

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### Bulk Abrasives Dispensing System

stores up to 19 ft<sup>3</sup> of material



A Flexicon Sizing-Dispensing System for abrasive materials receives, scalps, stores, and dispenses sand, rutile, zircon, and other dense, abrasive materials on-demand, free of dust. Fed by a pneumatic conveying line, the system is equipped with an integral cyclone that separates incoming solids from the air stream. A rotary airlock isolates the pneumatic system from atmospheric pressure and meters material into a vibratory sifter that discharges on-size particles into a surge hopper.

**Flexicon Corporation**

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### Laser Alignment Modules for Tight Spaces

feature a very low profile



Flat Pack Laser (FPL) Alignment Modules include the laser diode and its housing, a mounting base, and a separate power supply. The FPL is a very low profile (20

mm high) flat pack mounting for size constrained applications. Standard packaging includes a choice of <5mW red or green laser output, along with either a line or dot optic. FPL laser modules are suitable for just about any alignment application. They are ideal for alignment in drilling, counting, positioning and edge detection, as used in the industry examples identified below.

**BEA Lasers**

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### Flow Verification Switch

ensures set point accuracy for temps up to 100°F

The insertion-style FLT93F FlexSwitch combines a highly accurate, all-welded stainless steel sensing element with an advanced, user-friendly FlexSwitch control circuit. One standardized, field-configurable FlexSwitch control circuit satisfies virtually any combination of flow, level, and temperature application requirements.

**Fluid Components International**

MORE ONLINE: [nedinfo.com/76476-82](http://nedinfo.com/76476-82)

### Barrel Simplifies Cable Transport

can hold up to 400 lb. of cable



The Barrel Pack System packaging solution allows for easy transport of large cable quantities and reduces scrap on jobsites. Its 75-gallon fiber barrel design simplifies cable handling with an easy pull and a lever-locking steel band lid. Each metal clad barrel can hold up to 400 lb. This system can be combined with accessories including the Barrel Pay-Off Tripod and Harper Barrel Truck.

**AFC Cable Systems**

**AFC Cable Systems**

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### High-Strength Insulating Refractories

prevent cracks and the loss of strength



Plicast LWI 24 HS and Plicast Al-Tuff LWI 24 HS are both the safe choice for lightweight refractory linings inside high-temperature incinerators, boilers, and furnaces. Used in thermal environments of up to 2,400°F, these materials have low shrinkage and a low thermal conductivity rating.

**Plibrico Company, LLC**

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## Reciprocating Finishing Kit

provides a wide range of operational frequencies



The Ultrasonic Finishing Tool is designed for micro filing and polishing solutions. With its lightweight and ergonomically designed ultrasonic handpiece and powerpack, it can polish and deburr in hard to reach, intricate places. The handpiece uses an advanced high-performance oscillating unit and features a removable curled power cord for easy storage. The tool comes with an optional finishing kit featuring a complete selection of diamond files and ceramic polishing stones.

**Palmgren**

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## Heavy-Duty Wheel Buggies

travel at speeds of 5.9 to 7 mph



Two wheel buggies, the AW16 and the AW21, come with electric or recoil start options and allow operators to place materials with precision. The AW16 wheel buggy features a large 16 ft<sup>3</sup> bucket that allows the operator to transport a payload of 2,500 lb. The AW21 wheel buggy features a large 21 ft<sup>3</sup> bucket that allows operators to transport a payload of 3,200 lb.

**Allen Engineering**

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## Enclosure Installation System

prevents incorrect mating and matching



MIXO ONE series is an aluminum housings system designed to accept a wide range of single-sized MIXO series modules. These robust rectangular connector

enclosures are available in 3 hood variants and 1 bulkhead mounting base. The numerous combinations of the MIXO ONE housings and single-sized MIXO inserts will easily allow each module to be converted into a fully independent connector for electrical power, data transmission, optical signals or compressed air applications.

**Mencom Corporation**

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## Active Power Filters

automatically sense system voltage and frequency



The Apex line of Active Harmonic Filters include advanced features to ensure cost-effective power quality for variable frequency drive motors. Designed for dynamic reactive power compensation and harmonic filtering, the Active Filters sense distortion caused by non-linear loads and respond to cancel them out in real time. They save money by improving power quality, increasing process reliability and productivity, while complying with power quality standards.

**Acme Electric**

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## Gas Tester Detects Micro Leaks

works with helium, forming gas or carbon dioxide  
Providing manufacturers with a platform to easily detect and locate very small leaks, the Tracer-Mate II updates the previous generation with new features. It delivers an integrated tracer gas management and micro-leak detection instrument that works with any major brand of gas analyzer.

**Cincinnati Test Systems, Inc.**

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## Equalizing Power Chuck

can hold round, machined diameters and thin-walled workpieces



Ideal for CNC machining applications, the SJL 6-jaw equalizing and self-centering power provides the highest accuracy for thin-walled and deformation-sensitive workpieces. Unique to the SJL is the ability to be switched from a 2+2+2 lever equalizing chuck to classic 6-jaw self-centering chuck

depending on application requirements. Using the 2+2+2 lever balance capability provides high concentricity and axial runout accuracies by ensuring that the grip force of each jaw set equalize as pairs and are in contact with the workpiece continuously.

**SMW Autoblok**

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## Joining Tools Prevent Loosening and Leaking

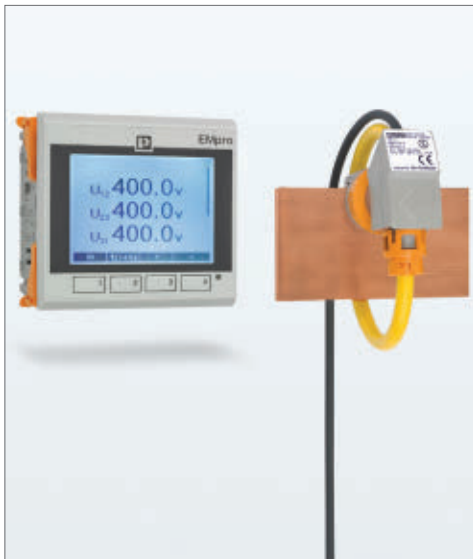
allow joints to be rolled to a torque or diameter spec

**Mechanical Joining Tools** join tubing to flanges and fittings, creating secure, leak-proof joints that withstand up to 20,000 lb. of hydrostatic pressure. Superior to welded, brazed or crimped joints, mechanically joined parts will not leak, pull apart, or loosen due to pressure, vibration, or temperature changes. Virtually any annealed or ductile product can be mechanically joined, including mild steel, stainless steel, aluminum, titanium, copped, cupronickel, Inconel and more.

**Monaghan Tooling Group**

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### Remote Tracker Reduces Energy Costs



Plant operators now have real-time, remote access to their machines' energy consumption data, with EMpro. This second generation of energy monitoring devices offers simple configuration and operation, so no special skills are needed to install or commission the device. The EMpro tracks energy parameters such as voltage, current, and power at the machine or system level. It then communicates that data locally, or transmits it to cloud-based services, creating an IIoT energy-monitoring solution. The device's three-step wizard automatically runs upon first power-up, with the option of importing and exporting configuration files

between meters. The monitoring capabilities in the integrated webserver make it easy to read and visualize data in real-time.

**Phoenix Contact**

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### Power Analyzer Offers Visual Energy Usage



The WM15 Three Phase Power Analyzer monitors and manages escalating energy costs while offering convenient installation and monitoring through the USC software mobile app. The analyzer can be used for single, two, and three-phase systems, as well as wild-leg systems.

**Carlo Gavazzi**

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### Reusable Insulation Blanket



A thermal, removable and reusable insulation blanket, LT550SG, improves safety for owners and operators of injection molding equipment. The blanket is designed to save energy, retain radiant heat, minimize insulation maintenance, and improve the surrounding work environment. The blankets eliminate temperature swings in the area around the equipment and operators no longer need forearm protection for safety as the blankets serve that role.

**Shannon Global Energy**

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# Supply Chain Champion



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### Energy Efficient Motors



IE5 SynRM motors offer up to 50% lower energy losses and significantly lower energy consumption than the IE2 induction motors. The IE5 level of efficiency is made possible by the SynRM design, which combines permanent magnet technology with the simplicity of an induction platform.

**ABB**

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### Detect Leaks With One Device



Improving energy management, the FTMg is a multi-functional thermal flowmeter sensor that detects gas flow, temperature, and process pressure. It reliably displays three parameters at once and saves money through improved energy management with the reliable detection of leaks. This flow sensor is also lightweight and compact, making it ideal for installation in tight spaces.

**SICK Inc.**

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**Synthetic Rope Overhead Crane**



Offering capacities up to 6.3 tons, S-series cranes use synthetic rope and a tilted hoist drum to propel overhead crane performance beyond current limits. The tilted drum prevents ropes from crossing, and the fleet angles remain straight all the way up to the drum, preventing the block from twisting as it sometimes does on a wire rope hoist. Tilted drum and off-set reeving eliminate

peak rope forces and reduce the wear on reeving components. The crane also features a hook block design that includes more long-wearing composite parts, estimated to last 45% longer than steel. And because the rope is made of synthetic material, the drum no longer needs lubrication, reducing maintenance costs for the customer. Three standard safe features include Snag Prevention, Hook Centering, and Follow Me, which help speed up operations while protecting employees and infrastructure.

**Konecranes, Inc.**

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**High-Speed Crossbelt Sorter**



The High-Performance Crossbelt Sorter MX 025H offers a conveying speed of up to 2.5 m/s. The sorter enables throughput rates of up to 20,000 conveyed goods per hour and is able to transport goods weighing up to 50 kg. Interroll Crossbelt Sorters operate

on a direct drive principle, in which the drive units can be positioned flexibly and offers power efficiency rates of over 85%.

**Interroll Corp**

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**Flexible Labeling Machine**



Handling large and small batches easily, the 362E Labeler is a two-sided module that can apply front and back or wraparound labels to a huge variety of products—up to 200 per minute. The compact unit is fitted with two HERMA 500 applicators for two-side labeling along with the option to integrate a third applicator.

**HERMA USA**

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The latest models in the G-Force and Easy Arm Intelligent Lifting Device line, the Q2 and iQ2, offer easy customization via the Smart Connector User Interface while leveraging data and communication. The units feature virtual limits, anti-drop functionality for tooling control, and fault code history log, plus blazing speeds and precision placement. Both units offer built-in wireless connectivity so users can service and troubleshoot their units without the need for Ethernet or USB.

**Gorbel Inc.**

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**Linear Shrink Labeler**



Featuring sturdy, intelligent, and simple operation, the ASL-300 shrink labeler applies heat shrink labels and tamper-evident bands at speeds up to 300 containers per minute. With a compact, cantilevered design, the ASL-300 is built with servo-motors, robust construction, and precision components. Label size changes are completed in five minutes on the HMI touchscreen with no tools or change parts.

**AMAC Technologies**

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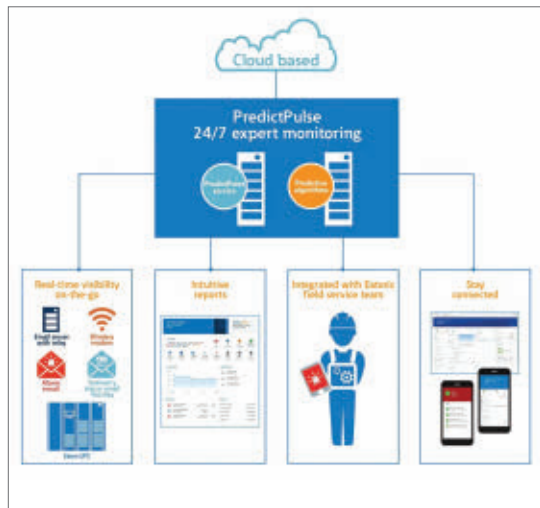
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**Remote Power Monitoring**



PredictPulse remote monitoring and management service now provides a new user experience for web browsers and mobile devices, making it easier than ever for data center and IT managers to monitor the health of their power infrastructure and respond to critical events from wherever they may be. The mobile portal interface gives users a view into real-time data, trends, events, service history, and alarms from any mobile or tablet device, along with a new PulseScore feature to communicate the overall health of a user's uninterruptible power system.

**Eaton**

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**Simplified Remote Maintenance**

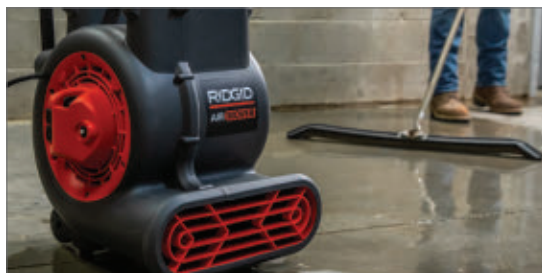


Providing quick, secure access to plants and machines all over the world, U-Link is a cloud-based, remote maintenance VPN service making maintenance easier and more efficient. The u-link cloud is used as a meeting point, securely connecting the user's PC running the u-link VPN software, with the u-link enabled Security Router.

The Security Routers ensure that different networks interoperate in unison and with top-level security. Once the Security Routers are added, users can access network devices, i.e. switches, PLC's, and other Ethernet-capable automation devices for troubleshooting, maintenance, or PLC program changes.

**Weidmüller**

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**RIGID**

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**Sanitizer Disinfects Surfaces**

MADISAN 75 is a 4-chain quaternary surface sanitizer, disinfectant, mildewstat, and virucide for hard, non-porous, and inanimate surfaces in various settings. It may be applied using a sponge, brush, cloth, mop, or by immersion or other applications specified on the EPA label.

**Madison Chemical**

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**Virus-Free Dehumidification**

DMSterile dehumidifiers generate a germ and virus-free atmosphere during mold dehumidification. The end products, such as pharmaceutical containers, PET pre-forms or sealing caps, come into contact exclusively with sterile air during production within the partitioning.

**Blue Air Systems GmbH**

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### Integrated Guidance and Measuring System determines positions with high-repetition accuracy



With magnetic tape adhered along the entire length of the linear guide, the IMScompact determines the position of the runner block by means of noncontact measurement at speeds of up to 5 m/s. It enhances the range of linear guides and is available in sizes 15, 20, and 25, making the measuring system for ball rail systems a compact and cost-effective extension for smaller machines. Integration into the runner block ensures high EMC protection, which means it is also suitable for use in combination with linear motors.

### Bosch Rexroth

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## FROM THE COVER

### Flexible, Adaptable 2.5D Vision System offers automatic focus to work at different distances



Robotic arms are often tasked with picking items not presented in the same orientation, shape or size. As opposed to other vision systems on the market, Eyes just needs to take a single image for calibration and part recognition and has an automatic focus to work at different distances within the same application.

Eyes is ideal for sorting a wide variety of objects or for CNC machine tending with metal parts that are defined by outer shape, as well as many other pick-and-place applications where orientation is important.

Eyes can be easily mounted on the robot wrist or externally, and integrates seamlessly with all leading collaborative and light industrial robot arms through OnRobot's One System Solution, a unified mechanical and communications interface based on the company's Quick Changer, now an integrated part of all OnRobot products. The vision system directly interfaces with other OnRobot devices making it very easy to use Eyes together with any of OnRobot's grippers.

#### OnRobot A/S

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### Hybrid Cable for Agriculture Machines can withstand oil, abrasion, UV rays, and microbes



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## FROM THE EDITOR

# A Return to “NORMAL”

## Grappling with the Post-COVID Future

As states begin re-opening this month after more than 80 long days of social restrictions and COVID-slowng precautions, nearly every conversation seems to center on the return to “normal.” These conversations, particularly regarding manufacturing, often seem to miss the point—they assume that the road forward is to carry on as though nothing has happened, as though the objective is to return directly to 2019 processes and trajectories and start this year over again. As much as I'd like a 2020 reboot, this is all, of course, impossible.



The fixation on the idea of “normal” assumes that manufacturing is somehow static or fixed—that the products it produces or the tools, processes, and techniques used to produce them are permanent or unchanging. Which is simply untrue. Every breakthrough or breakdown, every innovation or disaster experienced by this industry pushes it forward. It adapts and it changes, it creates new processes and new tools, new products and new tactics. That's how manufacturing endures and survives.

The effect of COVID-19 will be no different—it will change the world and it will change the industry forever, but mostly in ways that will eventually be difficult to pinpoint to the pandemic at all.

The trick now is to work out what some of these changes will be. For this, I keep looking back to those early post-recession days a decade ago.

In 2009, as the economy began to expand, everyone expected manufacturing to open its doors and begin hiring en masse—to get us back to pre-recession “normal” days. And that happened somewhat, but mostly what we saw was massive capital spending on a new wave of “smart” equipment and tools, of automation and early data collecting tools. It heralded a technological awakening in U.S. manufacturing—the beginning of the fourth industrial revolution and (eventually) the rise of the Industrial Internet of Things. Basically, the industry had just endured a disaster and needed to ensure that it had the tools required to return to growth and establish some stability in a still very shaky world.

This is exactly where we are again today. This new kind of disaster made clear exactly what kind of tools and technologies we need to remain steady. As we forge our new path forward, I believe we will see a new volley of investment along these lines—advanced automation, remote tracking and controls, and (finally) the full supply chain visibility and collaboration tools needed to keep essential products running no matter the circumstances.

The result, I believe, will be a new technology revolution in manufacturing, one that will set a tone of change for the next decade, long after the immediate effects of COVID dry up. It will make manufacturing a stronger, more resilient industry than before, with the tools it needs to really thrive in an uncertain world.

But this is not a “new normal” for the industry. This is exactly how manufacturing responds to every crisis, how it adapts and evolves from every set back. It's as normal as it gets.

**T. Travis Hessman**  
Editor-in-Chief

# How Can Preventative Maintenance Make Manufacturing More Reliable?

*Six tips on how to implement a preventative maintenance program and why it's so crucial to your operations.*

By Talmage Wagstaff

From a defective product that causes potentially disastrous recalls to a product delivered to your customer outside of spec, production machinery that isn't properly maintained is a manufacturing nightmare. When you think of preventative maintenance, you probably think a little bit of lubrication and recalibration doesn't make that big of a difference. However, root cause analysis of recalled products has shown repeatedly that a lack of a preventative maintenance program can cause those exact results.

By ensuring that you have an effective preventative maintenance program in place in your facility, you are actively playing a role in quality control in your facility. Manufacturing has plenty of variables that can sometimes be beyond our control, but preventative maintenance on your production equipment isn't one of them. What you lose in terms of production to perform preventative maintenance is gained back multiple times by producing a consistent and superb product that is meeting or exceeding quality standards:

## 1. Equipment Efficiency Means Product Reliability

By keeping your manufacturing facility properly maintained, you're ensuring that your machinery is running as intended. Lack of preventative maintenance is a common cause of process variation, and it doesn't take years to occur. The further off calibration a machine drifts, the greater the variance. Process variation often results in defective product or product that is off-spec.

For example, if your fruit filler is supposed to drop 3 oz. of strawberries per cup, yet it is only dropping 2.3 oz. into each cup because of a bad flowmeter, you are going to have customer complaints about the product having a low fruit percentage. Conversely, 3.2 oz. of strawberries per cup, and you have now skewed the product cost per unit for the entire batch, resulting in higher manufacturing costs and a lower profit margin.

With an effective preventative maintenance program in place in your manufacturing facility, you are ensuring that something as simple to remedy as a bad flowmeter doesn't result in scrap or rework product, or even customer complaints. By performing preventative maintenance, machines aren't given the opportunity to result in misformulations because of parts failure. Instead, they are regularly inspected, lubricated, calibrated, and tested to ensure that they are running at optimum levels and producing the highest quality product as they were designed.

## 2. Reduce Scrap and Rework Product

Rework products and scrap products are costly. In order to reprocess faulty or below standard products, you're adding production expenses but not increasing the product output. It isn't difficult to see how this could quickly turn into a manufacturing headache.

Efficiently operating equipment is the key to a consistent product. It only takes a small variance to ruin the taste or look of an entire batch and, depending on the variant, it may be a scrap product that cannot be rebled to salvage the batch. That is the equivalent of throwing raw materials directly down the drain.

Think about how many batches it requires to rework a tank of a product if you can only use a 7% rework in your formula. Depending on your batch size, there is a good chance that you'll end up losing product to expiration before you'll be able to use the contents of the rework tank. If that sounds costly, it's because it absolutely is.

## 3. Scheduled Output Vs. Actual Output

When a lack of preventative maintenance on your manufacturing equipment causes a large enough variance between scheduled output and actual output, it starts a chain reaction of negative effects in your facility. Because of less product output, production runs must increase to fill orders. Orders may be delayed, resulting in unhappy customers. It's a domino effect and it doesn't repair itself.

Once a certain percentage of the scheduled output is not being met, the reasons for the variance need to be investigated. Poorly maintained manufacturing equipment doesn't need to be a reason production goals aren't met. With a preventative maintenance program in place, it doesn't take long to have equipment running as it is intended, with reduced breakdowns and higher quality output.



Photo Credit: Getty Images

## 4. Less Downtime

Broken equipment resulting in unplanned downtime increases costs in almost every aspect of the facility. Labor of those on the clock, yet not producing. Parts costs, which are usually a substantial amount higher because you're now repairing and replacing parts instead of performing the measures to keep everything running on spec. And chances are, if you have allowed the equipment to run until the point of breakdown, there is a much larger repair to be performed than simple preventative maintenance would have cost.

The fact is, preventative maintenance programs have been proven to reduce equipment breakdowns and also maximize the life of your machines. The manufacturer provides preventative maintenance guidelines that should be strictly adhered to in order to see the best possible results from the equipment. By following the guidelines for preventative maintenance, you're protecting your assets, increasing output, and decreasing downtime caused by equipment breakdowns.

## 5. Balance Maintenance and Productivity

The ultimate goal of the facility is to achieve the balance of maintenance and productivity that prolongs asset life while meeting plant production needs. Without proper preventative maintenance, you're virtually guaranteeing that you'll see product variations due to poorly operating machines. The extent of the variation is the only real question to ask yourself.

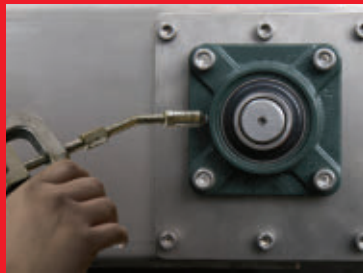
Taking the time and effort to properly maintain your facility is an effective tool in the fight against scrap and recalled products. When you manufacture a consistent product because your production equipment is running at its peak capacity, you're greatly reducing your chances in shipping products that are going to leave unsatisfied customers asking for refunds.

## 6. Develop a PM Program Before Breakdowns Happen

Putting a preventative maintenance program in place with the assistance of a Computerized Maintenance Management System (CMMS) only sounds difficult. Once you decide on the CMMS that would best suit your facility, you simply need to put together an asset listing and input the manufacturer's suggested preventative maintenance timelines. The time and labor that you expend on developing your preventative maintenance program is a mere drop in the proverbial bucket when you consider the price of one load of a recalled product. Don't wait for your production machinery to cost you customers and money. A CMMS and skilled maintenance team can ensure that your facility manufactures a quality product every single time. **NED**

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# The Secret To Keeping Electronics Cool!

## NEMA 12 Cabinet Coolers

The NEMA 12 Cabinet Coolers for large heat loads up to 5,600 Btu/hr. are ideal for PLCs, line control cabinets, CCTV cameras, modular control centers, etc.

- Measures 8" (203mm) high
- Mounts top, side or bottom
- Enclosure remains dust-tight and oil-tight

## NEMA 4 and 4X Cabinet Coolers

NEMA 4 and 4X Cabinet Coolers for large heat loads up to 5,600 Btu/hr. They are ideal for PLCs and modular controls.

- Enclosure remains dust-tight, oil-tight and splash resistant
- Suitable for wet locations where coolant spray or hose down can occur

## Type 316 Stainless Steel Cabinet Coolers

Type 316 Stainless Steel Cabinet Coolers for NEMA 4X applications are available for heat loads up to 5,600 Btu/hr.

- Resists harsh environments not suitable for Type 303/304
- Ideal for food and chemical processing, pharmaceutical, foundries, heat treating and other corrosive environments

## Hazardous Location Cabinet Coolers

New NEMA 4 and 4X Hazardous Location Cabinet Coolers for use with classified enclosure purge and pressurization systems are available for all Class I Div 1 environments up to 5,600 Btu/hr.

- Maintain NEMA 4/4X integrity
- Meet UL classified requirements
- CE compliant

## DON'T DO THIS!

It is an OSHA violation that presents a shock hazard to personnel

The fan blows hot, humid, dirty air at the electronics.

## BE AWARE OF CONDENSATION!

Refrigerant panel air conditioners cause condensation and moisture.

When condensation is present, electrical components can begin to erode, resulting in severe damage.

## A bad choice could cost you thousands!

### Look Familiar?

When hot weather causes the electronics inside a control cabinet to fail, there is a panic to get the machinery up and running again. The operator might choose to simply open the panel door and aim a fan at the circuit boards. In reality, the fan ends up blowing a lot of hot, humid, dirty air at the electronics and the cooling effect is minimal. If the machinery starts functioning again, the likelihood of repeated failure is great since the environment is still hot (and threatens permanent damage to the circuit boards). Worse yet, that open panel door is an OSHA violation that presents a shock hazard to personnel.

### The Real Solution!



Stop electronic downtime with an EXAIR Cabinet Cooler® System! The complete line of low cost Cabinet Cooler Systems are in stock and can ship now. They mount in minutes through an ordinary electrical knockout and have no moving parts to wear out. Thermostat control to minimize compressed air use is available for all models. All Cabinet Coolers are UL Listed to US and Canadian safety standards.



Made in USA

### Watch The Video!



[https://exair.co/61\\_ccv\\_ad](https://exair.co/61_ccv_ad)



**CE** The only compressed air powered cooler that is CE compliant!

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- Ideal for mounting near ovens, furnaces, and other hot locations

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NHP Cabinet Coolers keep a slight positive pressure on the enclosure to keep dirt from entering through small holes or conduits. For use in non-hazardous locations.

- Uses only 1 SCFM in purge mode
- For heat loads up to 5,600 Btu/hr.
- NEMA 12, 4 and 4X



Jeff Hauck, Lasercraft Inc. Cincinnati OH

"It took us three days to get a replacement computer cabinet and we didn't want to risk another heat failure. Fans weren't an option since they would just blow around a lot of hot air. Freon-type air conditioners like those on some of our other machines were a constant maintenance project of their own. We purchased EXAIR's Model 4330 NEMA 12 Cabinet Cooler System since it was easy to install and requires no maintenance."

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