

# How to Improve Production Accountability in Manufacturing

Production monitors provide real-time data visibility, enabling operators and managers to track and improve performance, identify issues and make informed decisions quickly to enhance manufacturing efficiency, reduce downtime and improve productivity.

**O**ne of the main technologies used to support manufacturing accountability are the production monitoring screens used to display a variety of production factors that keep personnel informed of their facility's production status. But how do these systems actually help improve manufacturing operations?

Shalli Kumar, founder and chairman of EZAutomation and its parent, AVG Advanced Technologies, offered his insights into how production monitoring systems can not only improve manufacturing operations, but help manufacturers compete on global basis.

**Q:** Why have production monitoring screens remained so important to manufacturing operations for production accountability?

**SK:** The first fundamental principle in improving manufacturing efficiency and quality is to measure it and display the results for operators and management to easily see the results so that they can improve. Most current production monitoring systems show the result on a computer screen, which is not usually accessible to operators performing the task.

Second, most humans are competitive by nature. If you have two or more production lines performing the same task, a production monitoring system right in the face of operators is bound to produce better results.

As manufacturers of electronic products ourselves, I have seen this



phenomenon in many of our plants all over the United States and that is one of the reasons EZAutomation and AVG are able to compete with the products made in China. We constantly monitor and improve efficiency along with quality.

**Q:** Production monitoring systems have long been used in high-margin manufacturing environments where PLCs and SCADA systems are widely used to provide the data for those production monitoring platforms. But for smaller manufacturers with only semi-automated manufacturing environments, these systems aren't usually feasible from a cost perspective. You're addressing this technology gap for smaller manufacturers with the introduction of EZ Production Monitor. Can you give us an overview of this product?

**SK:** A typical PLC and SCADA system will cost more than \$15,000—taking into account the cost of the PLC, SCADA and lots of time to program both. Many smaller plants cannot afford to put a \$15,000 system on each one of their lines. But even the

▲ EZAutomation's new EZ Production Monitor provides a cost-effective way to measure and improve productivity across semi-automated manufacturing processes.

📷 Courtesy of EZAutomation

bigger plants must use large monitors or marquees to display the monitor information.

So, here is how the concept of the EZ Production Monitor system—EZ PM—came into existence. I was talking to the control engineering manager of a large plant in Ohio that made assemblies for automotive manufacturers. This engineer told me that using a Rockwell PLC and EZAutomation LED message display he was able to improve the productivity of his plant in the lines he put them on by 50% in just three months, and he was recognized by the top management of the plant for accomplishing this.

Talking with smaller customers—with 25 to 200 employees—it became obvious that these plants do not have the resources to implement a production monitoring system like the Ohio plant. So, they stick with paper reports or Excel spreadsheets. We thought of making it easy for every manufacturing plant in the world to have this

monitoring system by preprogramming the PLC as well as the LED message display and making it available to these plants for a cost starting at \$649 up to a full-fledged system for just \$999.

There are four models available based on the customer's need for an online display. The top-of-the-line system pays for itself in less than one month.

**Q:** Can you explain the setup of the EZ PM? Is there any coding involved?

**SK:** This is the beauty of the EZ PM—no coding is required for either the PLC or the LED message display. All the user has to do is enter five parameters in a free user interface: assembly number of the part number you're making, number of hours in the shift, goal per hour, minimum production rate and minimum quality rate. The EZ PM does the rest. It monitors the rate, the task time per operator and production and quality limits. It also gives relay outputs if limits are not met and takes into account breaks or line downtime for repairs and logs all this in real time.

The LED message display is a two line, 10-character display visible up to 100 feet away. It's like an intelligent stack light with text information. If rates are good, it is green; if not, the text is orange for alerts.

To set up on a line, all you have to do is mount it where everyone involved can see it. Run a wiring cable from the monitor to a small control station accessible to management only. The control station will have a "start the line" button, a "pause" button and an "end of the shift" button. To program it, you have a Wi-Fi connection built into the monitor and you can connect it to a computer up to 50 feet away.

The user needs to decide what sensors to use for count inputs and quality inputs—these could be proximity sensors or electromechanical switches. We have also included sensor integrity check logic in the EZ PM. If you choose to use this option, you have to enter three timing parameters. The monitor will alert management if the sensor inputs have a problem or the sensor

input is being tampered with. Under this condition, the monitor will send an alert and stop counting until the problem is corrected and the line restarted.

In the starter kit we include our 30-millimeter triple sense proximity switch that can sense metal up to an inch from the target.

**Q:** Tell us about the visibility of EZ PM in terms of how far away it can easily be seen and what your recommendations are for deployment based on the size or setup of the facility?

**SK:** Simple rule: A 1-inch character is visible up to 50 feet away. Since the EZ PM has two lines of 2-inch characters, the messages are visible to 100 feet away. This is good enough for most applications but, if needed, we can custom design a monitor to increase the viewing distance to 200 feet or even 400 feet.

**Q:** Is it possible for the EZ PM data to be accessed by other means rather than just visually?

**SK:** The data can be seen over Wi-Fi connection to the computer up to 50 feet away. That data is also stored inside the monitor and a .csv file of production data for up to one year can be retrieved at any time for further analysis of the production line.

**Q:** You note that the EZ PM is particularly well suited for lean manufacturing operations. Can you share some insights into how this benefits lean manufacturing specifically?

**SK:** The Ohio plant I mentioned had 10 lean cells. In a lean cell, operations are semi-automatic. The operator is present to feed material or do some other operation like tightening a bolt or adding a part. Operators, industrial engineers and management are encouraged to constantly adjust the semi-automatic operation of the lean cell to improve productivity and quality while reducing human fatigue. Instead of using a stopwatch to monitor task time at each station, which tends

to produce artificial results as the operator is conscious of being timed, the EZ PM records the rates after each process improvement is made. That's how EZ PM becomes an engineering tool to improve productivity and quality.

**Q:** EZAutomation strongly promotes that its products are made in America. Aside from the clear benefits of supporting American manufacturing operations, what benefits does your approach provide to the kinds of manufacturing operations you designed the EZ PM for?

**SK:** Make no mistake, China is now an existential threat for America. Sentiment around this is bipartisan. We need to bring manufacturing back to the U.S., as was the case in the 1980s and 1990s until China decided to wage an unrestricted war on American manufacturing starting in 1998. We lost over 10 million jobs in the U.S. in the next eight years. China became the manufacturer of the world, and we increasingly became consumers of Chinese products. Imports went from \$50 billion a year to almost \$400 billion a year in the U.S. This has to come to a stop.

With this in mind, our manufacturing plants have to think hard about how to compete with Chinese labor, which is one quarter of the cost in the U.S. To compete, we have to increase our productivity by at least three times. EZ PM will go a long way toward making this happen. In our small manufacturing plants that employ 80% of our workforce, as well as in larger corporations, I certainly hope that EZ PM becomes a significant tool for expanding our current manufacturing plants in the U.S. as well as opening new ones. **AW**



Shalli Kumar is the founder and chairman of EZAutomation and its parent, AVG Advanced Technologies.