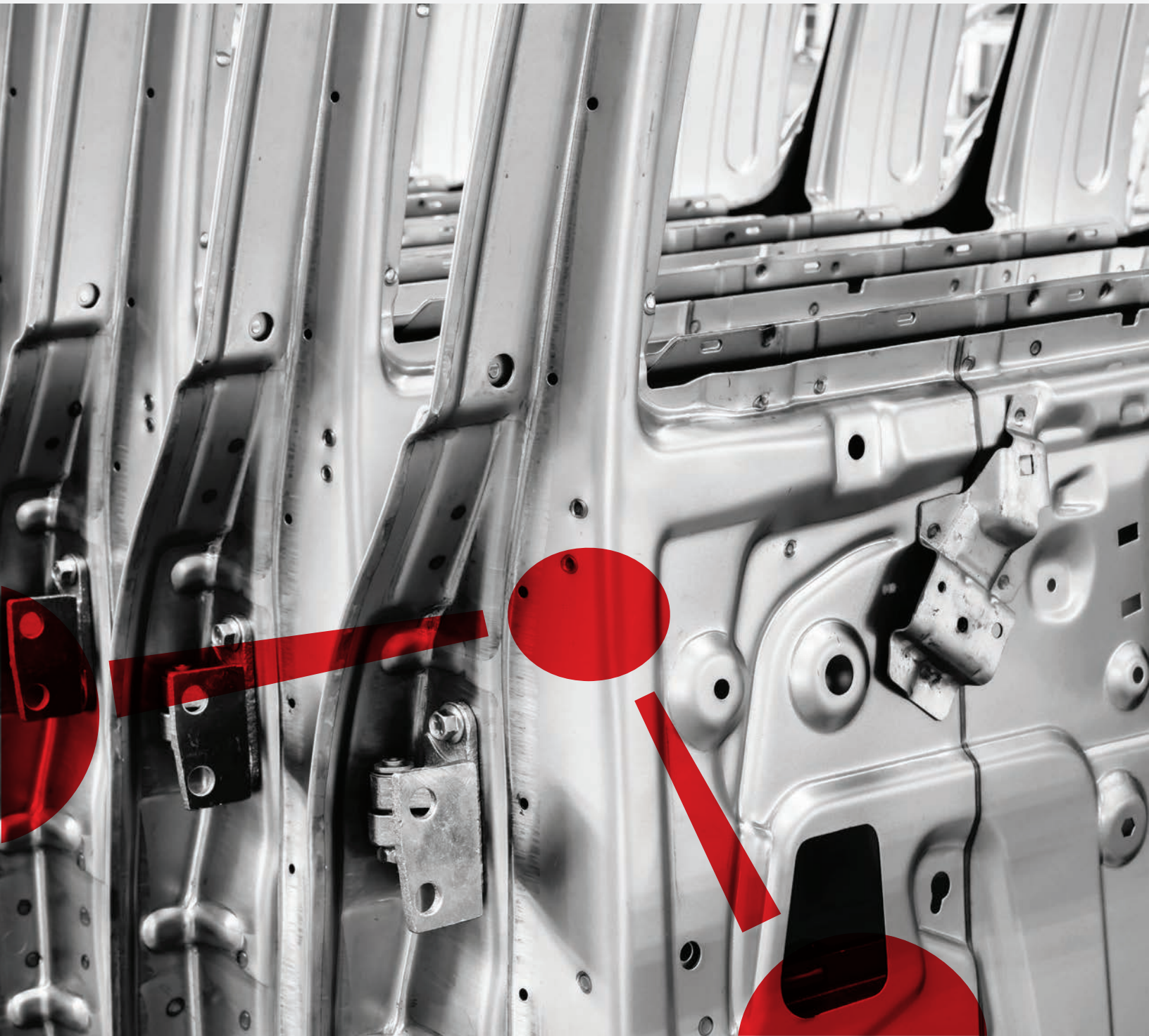## Case Study

Keeping Mission Critical Automotive Manufacturing Operations Running around the Clock

To keep an automotive manufacturing operation running 24 hours a day, auto manufacturers have utilized Kanban systems, lean manufacturing and just-in-time manufacturing (JIT) however these business processes require tracking of the inventory and materials within a manufacturing facility. Manufacturers that truly want to automate the replenishment process utilize automatic identification such as RFID to create real-time visibility into their manufacturing and inventory management process.

One such automatic RFID replenishment system is from MSM Solutions called PortalTrack. This automated RFID and customizable software solution provides real time visibility without disrupting workflow and can be seamlessly integrated into current manufacturing processes. The end result also provides for a more accurate inventory control and will prevent lost revenue in mission critical applications.

MSM's PortalTrack system was successfully implemented in an automotive production site of a premium car manufacturer. MSM Solutions was able to work within the existing process flows without disrupting work in process and tailoring its PortalTrack Software to provide the required reporting and metrics that enabled real time visibility for more informed decision making.

As a leading automotive manufacturer, maintaining production without interruption is paramount. Having accurate real time visibility allows the customer to know exactly what they have on hand, along with its precise location.

PortalTrack enables visibility throughout the entire internal supply chain, thus enabling employees to make smarter decisions faster to insure production keeps running.

Using RFID to Maximize Uptime

The goal of the premium car manufacturing project was to provide an automated real time visibility solution utilizing RFID to track and visually report work in process replenishment inventory to maximize uptime for a mission critical 24x7 automotive manufacturing operation. The manual processes currently in place relied too much on human intervention resulting in production delays, inaccurate inventory counts and lost revenue.

After an initial site assessment of a premium car manufacturer, MSM Solutions provided the customer with a completely integrated RFID solution. What drove this integration was finding a durable metal mount hard tag that provided reliable read ranges up to 20', develop a network strategy that entailed not directly interfacing the hardware and software components with the customers network but utilizing an IoT Network solution to manage the RFID read data, reduce deployment time, and provide a secure independent network.

Also, it is important to note that the traditional ways of running hardware and software solutions directly on a customer's network are becoming increasingly more stringent due to security concerns, infrastructure costs, lack of IT resources and complexity of deployment. However, MSM Solutions was able to overcome all of these challenges using their cloud-based software and IOT network technology which takes the burden off of internal IT support, reduces costs, has zero maintenance for the end user, along with providing security and allowing for rapid deployment.

With a new car rolling off the line roughly every 80 seconds it is imperative that the right parts and the right counts be at each designated work station in the process. The parts replenishment process flow for the production facility works in a continuous cycle with parts flowing from the supply side of the facility to the manufacturing lines. Parts are placed on racks and assigned to a specific part number with a specific count per rack. The racks are equipped with durable metal mount RFID tags that identify the part number. Once the racks are loaded, multiple racks are then hooked to an automated tug which moves the parts from the supply side to the manufacturing lines.
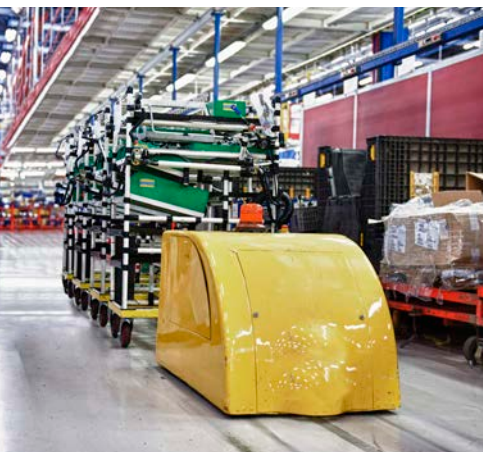
As the tug travels, it passes 2 sets of RFID Fixed Readers and Antennas; one set of RFID readers monitors inbound inventory to the manufacturing lines and another set of RFID readers monitor empty racks returning from manufacturing back to the supply side to be reloaded. Each part number has a target inventory level that must always be on hand in the manufacturing facility. As items enter the manufacturing side via the automated tug, the RFID tags are read and the inventory is automatically increased. On the other hand, as empty racks exit the manufacturing side the RFID tags are read again, and the inventory is automatically deducted. The real time inventory counts are displayed on large monitors throughout the facility and on a web-based dashboard for viewing on any device.

Rolling out RFID within the Existing Process Flows

Once a date was determined for the physical install of RFID, MSM Solutions installed all the readers, cabling, mounts, cellular devices and flat panel monitors in a 2-day period. The PortalTrack customized software solution was live within 24 hours of the hardware installation.
One key metric that was uncovered by MSM Solutions during this process was that once the system was in place, they were able to provide some travel and real time analytics that drastically changed the customer's stated expectations.

For example, the customer's perceived expectation for a particular parts cycle rates from supply side to manufacturing was deemed to be on the replenishment cycle of "X" when in reality the system showed the real cycle rate was "Y". This was a key discovery in that MSM Solutions found parts that were not being

replenished at the required cycle rate, parts that were not moving at all, and others that were traveling on paths that went against the workflow.

The net gain of having the real time visibility into the production flows instantaneously allows management to react and institute the corrective measures so that production stays on schedule and replenishment efforts remain focused on the most critical parts at any given time.
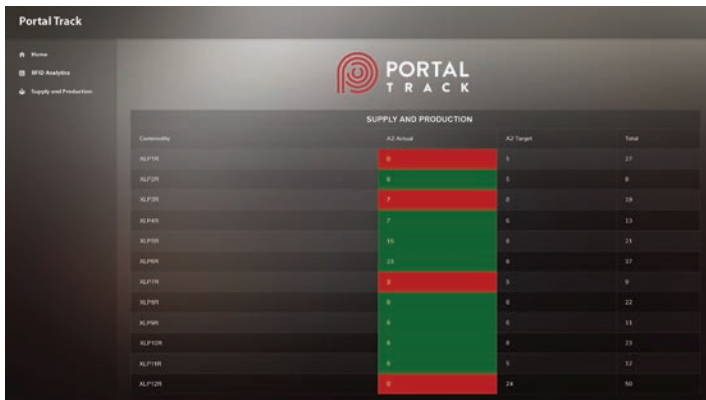
The return on investment for the system was less than three months and the project continues to expand to more applications within the facility.

How a Customized Cloud-Based Software Solution with Stand-Alone Secure Network Operates Independent of the Customer's Network

A few key requirements for this installation was that the entire solution needed to operate independent of the customers network based on internal security protocols, limited available IT support, infrastructure concerns and the need for rapid deployment. MSM Solutions was able to customize a cloud-based Cradlepoint IOT Network coupled with our PortalTrack software that provided a solution that was secure, completely manageable outside the 4 walls, reduced the infrastructure costs, required no internal IT support and was easily deployable and expandable.

PortalTrack software displays racks and pallets that are tagged by outside suppliers then received via RFID.

Real-time inventory count where green show target stock level met or exceeded and red indicates low inventory level.

By eliminating the manual data entry system, MSM Solutions bundled the company's new RFID module with its existing solutions. The result provided a fully automated system of goods receiving, automatic inventory updating, real-time visibility of production line consumption, and automated warehouse and vendor replenishment. The products and technologies suggested to the premium car manufacturing company included Zebra FX7500 readers, Times 7 5010 Flat Panel Antennas, CradlePoint IOT devices, Xerafy Cargo Trak RFID Hard tags, and 50" Flat panel commercial monitors.

In many cases customers have asked about dashboards that can easily display a real-time visual inventory report. The visual inventory report created by Portal Track is represented by 3 columns. Column A shows the actual real time inventory count for a part on hand in manufacturing and provides a visual representation with a real time count and a color code of either green (target level met or exceeded) or red (inventory level low) when compared to the target inventory level. Column B displays the target count for an item to always be maintained in manufacturing, and Column C displays a total count of all the racks available for an item.

Times-7 Slimline A5010
Circular Polarized Antenna

Xerafy Cargo Trak
RFID Hard tags

Conclusion

RFID adoption rates in the auto industry are steadily increasing and the applications are expanding. Traditional barcode technologies rely too much on human interaction and are no longer sufficient in today's data driven global economy. Having access to real time information and analytics drives informed decision making that results in less downtime, increased sales, improved inventory accuracy and knowing an item's location instantly. RFID and PortalTrack enable connectivity that allows companies to identify, track, count and manage all of their assets from point of origin to point of sale.

Due to the success of the of this initial project, MSM Solutions is piloting a new supplier level project with the same automaker. For this project MSM's PortalTrack software manages the printing and encoding, reading and analytics for an estimated 500,000 supplier totes that will be read at the receiving dock doors at the automotive manufacturer.