

CUSTOMER EXPERIENCES...



LEVELER'S PATENT-PENDING LOAD-CENTRIC POWER ANALYSIS (L-CPA™) MEASURES AND RESOLVES THE IMPACT OF POOR POWER QUALITY ON MANUFACTURING AUTOMATION

BACKGROUND

Industrial Automation, LLC.® of Rochester Hills, Michigan develops cost effective automation solutions for its clients. They utilize both proven and state-of-the-art technologies to meet customer specifications. In the summer of 2004, Industrial Automation manufactured thirteen custom robotic ultrasonic welding automated assembly machines for Plastech® to be installed at the Ford Motor Company Assembly complex in Chicago, IL.

Although each fixture has a different mix of tooling and equipment, what they do have in common is a programmable logic controller to govern operation.

This robot is typical of a mixed power environment where two things occur. First there is an electronic system in place responsible for information processing and direct or indirect control over the operation of the non-electronic applications. Secondly, all devices are traceable to a single power path.

LEVELER AND INDUSTRIAL AUTOMATION WORK TOGETHER

"Industrial Automation's programming engineers were having difficulties with the communication between the robots and the welders. Our engineers suspected electrical disturbances were causing the failures, but were unsure of the source" states Michelle Kozlowski, Program Coordinator for IA. Their frustration was that they had pursued and exhausted all other remedies (software changes, electrical wiring rerouting, etc.) except power quality. IA and Leveler worked together to solve this problem by using the L-CPA.

"Leveler's expertise provided Industrial Automation with an expeditious and cost-effective solution to the problem. The products manufactured for us by Leveler are now a standard on all robotic ultrasonic welding machines manufactured by Industrial Automation."

Michelle Kozlowski
Program Coordinator
Industrial Automation, LLC

INFORMATION GATHERING

Leveler's L-CPA sets a very specific methodology in motion so a customer knows the true quality of power being experienced by

PROBLEM RESOLUTION IN MANUFACTURING

electronic systems. Key to this process is that 1) all data is gathered while "under load" and 2) measurements are taken closest to the load. The data from these points is combined and synthesized to create the "Load-Centric" power experience profile. This unique analysis pinpoints the root causes of poor power quality conditions, assesses their severity in relation to the electronic systems, and provides an exact means to deploying remediation efforts.

The L-CPA for Industrial Automation included:

- Source(s) of Fault Current on Ground
- Harmonic and Surge Amplitude, Frequency, and Dissipation Pathways
- Power Factor due to Current Harmonic presence
- Load Balancing
- Repetitive Transient Activity
- High-Frequency Noise presence, pattern, amplitude, and source(s)
- Neutral wire excess current measurement
- Presence and performance of installed protection
- Temperature (Ambient, conductors, power supplies)

ANALYSIS

The Industrial Automation review of the L-CPA report created a clear definition of the power problems as well as the steps necessary to remediate the poor power quality causing the PLCs to malfunction.

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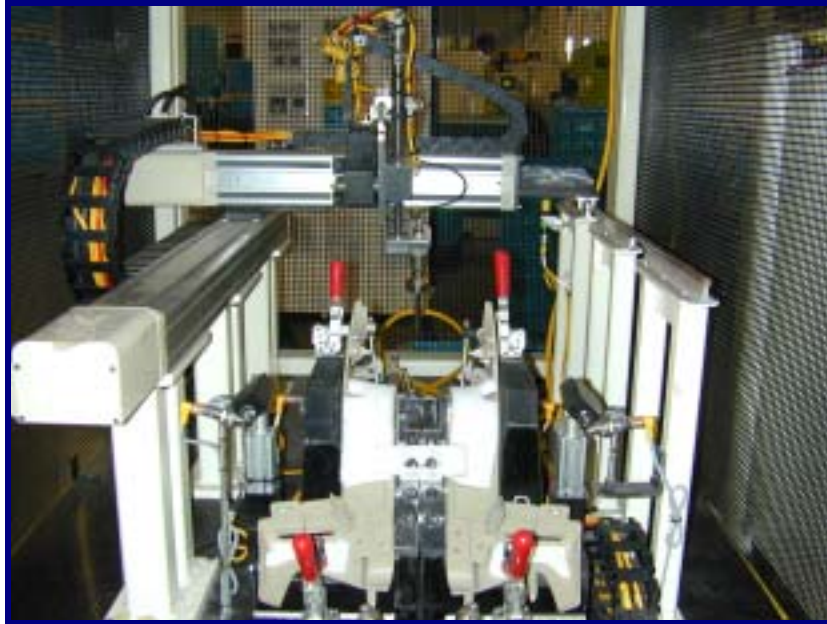
PROBLEM RESOLUTION IN MANUFACTURING

REMEDIATION

The Analysis clearly defined the impact caused by the poor power quality. The solution to the robots' electrical problems was to give the PLC and robotic arm controllers properly conditioned sources of power. Leveler's Power Interfaces from the Bantam and Centurion product lines were deployed to provide

conditioned paths for the electronics. Leveler technology removes the excess current, corrects the impedance characteristics, attenuates the noise and harmonics, and prevents all surge energy right at the input to the electronics. Furthermore, there is no ongoing electrical cost to use these Leveler products, unlike the cost associated with standard centralized solutions. Conditioning at the point of use provides the controllers the highest quality power possible. Leveler's solution has consistent performance metrics regarding its output with a live system; therefore when armed with an L-CPA report, Leveler and IA knew

what to expect before one Bantam or Centurion was put in place. A post-installation power quality audit confirmed that the



Pictured above is one of thirteen Industrial Automation, LLC® robots at Plastech®/Chicago.

The result of the differing use of the power is dramatic; the outcome being that high-power tooling can affect the operation of other more sensitive electronic applications. Data gathered by the L-CPA identified power quality conditions known to be adverse to the operation of the PLCs within these robots.

power delivered was the power required by the PLCs.

After over 1 year of continuous operation, these robots continue to experience no power quality disruptions.

SUMMARY

Mixed-power environments that combine linear power equipment and non-linear electronics is now standard practice. The power quality problems found within the IA robots are not unique to IA or the industry; they occur everywhere that linear and non-linear loads exist on a single electrical distribution infrastructure. Leveler in executing its patent-pending L-

CPA provides the necessary power quality information that allows a customer to move quickly from problem identification to solution.

Leveler helped IA manage their power quality concerns by providing the unique toolset to measure those concerns. Furthermore, Leveler's revolutionary technology was used to eliminate those concerns, saving money, time, and material.



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