

Optessa Enables Real-Time Re-Sequencing for Assembly Lines

“Smart PLC” responds automatically to triggers to re-sequence and generate an optimized schedule to keep the assembly line always on track

Detroit, Mich. – SAE World Congress – April 14, 2008 – In order to remain competitive in today’s tough market, automotive OEMs must be able to respond quickly to changing customer demand and market trends – whether it is gas prices driving down sales of SUVs or an individual customer changing a custom order or the demand for GPS systems in all sizes of cars. All of these changes create a trickle down effect from the auto OEM through to the sub-assemblies making gears and machining crankshafts, for instance. While some of these shifts in the manufacturing schedule can be predicted and planned for, others happen on the fly – in either case, the manufacturer is pressured to respond rapidly and flexibly.

To address this challenge, Optessa Inc. today announced the Optessa MLS with Real Time Sequencing (MLS-RTS) solution, extending the value of the company’s Multi-Line Sequencing and Scheduling (MLS) platform. Optessa MLS-RTS enables real-time automated re-sequencing of in-plant and out-of-plant scheduling and sequencing, giving manufacturers the power to respond, resequence, and refocus their operations in real time.

Optessa MLS helps auto manufacturers optimize and smooth assembly planning, sequencing and scheduling so that OEMs and suppliers can more effectively fulfill customer demand through its superior schedules and fast optimization engine. Optessa MLS provides an optimized and evenly favorable solution for every model and part throughout the schedule horizon. With the addition of RTS capabilities, these optimized schedules can be automatically re-sequenced within the scheduling month, week, day, or even hour, based on pre-defined triggers or manually as ad-hoc needs arise. Because MLS-RTS can be integrated with plant level systems like Manufacturing Execution Systems (MES) or line control systems or even directly integrated with the Programmable Logic Controllers (PLCs) controlling ASRS or other storage buffers, the newly optimized schedule is not only created in real-time, but can also be implemented seamlessly in real-time.

Application points for Optessa MLS-RTS include:

- FIFO sequence: Body to Broadcast
- Body / Frame / Weld on sequence
- Paint sequence
- ASRS / Channel Bank sequence: to Final Assembly
- Split / Merge point sequencing
 - For example, multiple Weld / Body lines to a single Paint line
- Feeder line synchronization sequence
- Routing
 - Aisle / Channel / Lane selection
 - Line selection

According to a recent report by leading industry analyst ARC Advisory Group¹, Research Director Ralph Rio states, “There is always a difference between what was built and what customers actually buy. Those with assembly lines have additional constraints that compound the problem. Changing the line over for the needed products is expensive and often contrary to the production manager’s metrics. The difference between production and actual orders leads to excess inventory, poor on-time delivery and lost orders. Recent trends in product proliferation and reducing set-up for easier change-overs combined with the adoption of ATO and JIT are driving the development of advanced software applications that can manage the complexity and provide the needed fast response to exceptions.”

A typical automotive plant consists of many assembly lines, and “work in process” between these lines is stored in buffers. Selection of vehicles to be forwarded out of these buffers to the next stage of assembly is generally done by PLC-based logic. Conventional schedulers that are implemented within MES systems or PLCs make decisions based on ‘what is best next’ because they only have access to information about what is currently stored within the buffer.

In contrast, Optessa MLS-RTS looks at the global picture – i.e. downstream or upstream events. With this additional information, it considers the impact of each selection on succeeding selections, and makes decisions that provide the best sequence quality over time. Optessa MLS-RTS creates a more informed sequence and introduces an optimized sequence into the PLC, in effect creating a “smart PLC.”

Optessa MLS-RTS responds automatically to predefined triggers to re-sequence and generate an optimized schedule that reflects changes in status on the assembly line or in the schedule. For instance, when supply levels get low, this may trigger an automatic re-sequencing to create a schedule that does not exceed the available supply. The triggers can be pre-defined based on anticipated variables, or resequencing can be triggered manually based on unexpected events.

“What makes Optessa MLS-RTS so revolutionary is its ability to leverage all of the power of MLS, and implement it in real time – so there is minimal lag time between a trigger event, generation of a newly optimized schedule, and execution of that schedule within the line,” said Vasu Netrakanti, chief executive officer of Optessa. “MLS takes all of the variables into consideration, and unlike a legacy PLC-based scheduling system, which just knows what is currently in state, MLS-RTS looks at the present, past, and future to understand the full picture. This level of responsiveness within a plant increases efficiency, decreases waste, and results in near eradication of assembly line downtime.”

To better understand the power of Optessa MLS-RTS, look at how it is being used today within sub-assembly engine parts supplier. Because they are three rungs down in the supply chain, their demand is constantly changing by what happens upstream. In order to meet demand without carrying excessive and costly inventory, the plant has specific inventory targets that must be maintained. When any of these hit the minimum level, supply levels for their assembly fall low, or overall upstream demand spikes, Optessa

MLS-RTS automatically triggers a reschedule. A new optimized schedule is generated, approved by production control, and delivered to the line all in real-time.

The Real-time Re-Sequencing (RTS) capabilities sit on top of the rich Optessa MLS platform, which uses modern stochastic search techniques to find a near optimal solution rapidly. The output is a global optimal schedule that maintains a bias to the original schedule, changing only what is necessary to achieve material stability while responding to required changes. Optessa MLS-RTS delivers a level of flexibility that allows Automotive OEMs and their suppliers to respond quickly, efficiently and intelligently to changing market and customer demand.

For more information about Optessa MLS, download the whitepaper, "Using Modern Scheduling Systems to Deliver to Customer Demand" at http://www.optessa.com/products_download.htm.

¹ "Assembly Line Control and Sequencing. Make or Buy?" ARC Insight, February 14, 2008. www.arcweb.com

About Optessa

Optessa Inc. is an emerging leader in scheduling and sequencing optimization software for high volume manufacturers. Optessa offers the only software solution that can effectively optimize assembly planning, sequencing and scheduling across all of a manufacturer's product lines and constraints. It solves these complex problems through a unique combination of modern optimization techniques based on patent pending algorithms and extensive domain knowledge. Optessa's customers include some of the largest, global brand manufacturing companies, and its platform is designed to solve the needs of companies in automotive, semiconductor and other high volume discrete manufacturing environments. To learn more about Optessa, please visit www.optessa.com.

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