OMAC PackML Standardization: Opportunities for
Improved Performance in Manufacturing

SHAPING THE FUTURE TOGETHER

The Organization for Machine Automation and Control (OMAC[1]) was created in 1994 to offer companies a framework to develop standardization and improve the performance of manufacturing. In recent years, OMAC's Packaging Workgroup has entered into a phase of dynamic evolution. Leading manufacturers such as Nestlé, Arla Foods, Procter & Gamble and Boeing are driving the effort for wider international acceptance. As an OMAC member since 2014, COPA-DATA directly supports this development. In this interview, Mr. Arne Svendsen, OMAC Board Member and renowned expert in MES and automation, shares his vision of fully profiting from standardization.

[1] www.omac.org

At the end of 2015, the ISA-88 committee approved the document ANSI/ISA-TR88.00.02-2015 Machine and Unit States: An implementation example of ANSI/ISA-88.00.01. Known as TR88 or PackML, it was developed by the OMAC Packaging Workgroup. PackML specifies unit state models and operation modes for machine control and packaging line implementation. *Figure 2* shows the PackML state model. PackML also defines a set of meaningful data tags, called PackTags. They serve for standardizing internal machine automation and communication with other machines or systems.

Let's explore what makes PackML so beneficial for industry.

What do you see as the most critical challenges in manufacturing today? Can OMAC PackML standardization help to address them?

Today's manufacturers are facing a number of challenges in their production and packaging facilities. These include fast-changing markets and increasing pressure to reduce "time to market". Many manufacturers are also dealing with complex customer requirements. For example, food manufacturers producing private-label products for retailers.

Developments in new machinery and equipment from sub-suppliers are coming in faster increments, and manufacturers need to respond to this. We are also seeing an increasing desire to build a "digital twin", to build the story around products, i.e. to make relevant traceability data of product and production available for the retailers and, eventually, for the consumer.

Open industry standards represent one of the most important answers to this whole range of volatile and increasingly complex challenges.

How would you describe PackML?

PackML is an open industry standard. In formal terms, it is a "semantic" protocol, as it structures the information to be shared between packaging units, packaging lines and even – as per Industry 4.0 – shared with cloud data storage. The best way to think of PackML is as a "USB for Manufacturing". When you buy any USB device, you can easily connect it to your computer because of the standardized specifications. In a similar way, you can easily connect a packaging machine to a line controller or SCADA system if both are adhering to the PackML standardization. And please remember, despite its name, PackML is a very useful connectivity standard for both production and packaging lines.

For example, in one of its cheese dairy plants, Arla Foods would use PackML to connect units and machines in the cheese production area and the finished goods packaging and palletising area. Only the very first part of the dairy – the milk-processing area – would be treated as pure process automation. PackML originates from the ISA-88 standard that we use in process automation, so the "language" in the standards documents is similar, and a process-automation expert would find PackML very easy to understand and adopt.

What are the main deliverables of OMAC today?

There are a number of benefits delivered by the OMAC organisation today.

First, OMAC has developed an Implementation Guide, which makes it easier for companies to adopt the standard. In addition, industry leaders such as Procter & Gamble, Nestlé and Arla Foods are sharing their documentation and even PLC source code, although you will need to be an OMAC member to access this information in full.

ABOUT OMAC

OMAC's Packaging Workgroup brings together end-user manufacturers, automation technology suppliers, OEM machine builders, system integrators, and other organizations worldwide. Members collaborate to create standards that improve machine-to-machine integration and packaging line to business system performance. OMAC PackML defines a common state model, modes and tag-naming conventions for automation. It has been implemented on control platforms worldwide to increase reliability, reduce costs, ease integration and shorten project timescales.

ARNE SVENDSEN
Arne Svendsen holds a M.Sc. EE(P) and Computer Science. He has over ten years of experience in PLC firmware and SCADA software development and another ten years as a consultant in computer-integrated manufacturing. Since 2002, Arne leads the corporate MES and automation team within the Global IT group at Arla Foods. Arne is a board member of OMAC.

Following 2016, a year rich in activities within OMAC, 2017 brings further dynamic change. OMAC will introduce PackML at PackExpo in US, Interpack in Dusseldorf. Then OMAC volunteers, end-users and automation suppliers will present PackML at numerous conferences around the world.

In addition, we want to share real implementation experiences at conferences – such as the one in March 2017 in Copenhagen. You can find more information about these events on the OMAC website.

What are the short- to middle-term plans of the OMAC PackML workgroup?

As an OMAC member company, you gain access to workgroups where the future OMAC guidelines are being developed. In autumn 2016, we released Part 1 of the PackML Unit/Machine Implementation Guide dedicated to the PackML Interface State Manager. We found it very useful to document best-practice recommendations for machine interoperability. Even different machines, which internally do not follow the standardization, can present a PackML-compatible interface. The appropriate mapping of a proprietary status model with the OMAC state model has an important place within Part 1.

We are going to develop additional specific guidance for other topics connected to PackML, from the internal machine code-structure, through to user interface and line integration. Wider participation by different companies and specialists will be key for creating valuable documents.

How will end users profit from the OMAC PackML standardization on their way to the "smart factory", Industry 4.0 and IIoT?

PackML is delivering benefits to end users in terms of: rapid integration of different machines within the complete line, more transparency of machine data for greater productivity, and flexibility at a reasonable cost. Of course, OEMs and integrators benefit as well, because standardization supports modular solution design and implementation. The engineering costs are lower, the documentation creation is faster and all related services become easier.

For Arla Foods, which is just now laying out an Industry 4.0 strategy, PackML is a strategic component for a number of reasons. First, we have a very mature MES implementation on 50 sites already today. Second, we are implementing PackML in the production and packaging areas, primarily to provide even more agility in building,

Figure 1: PackExpo exhibition in Chicago, fall 2016: the leading suppliers B&R, Bosch Rexroth, COPA-DATA, Festo and Siemens presented an initial interoperability demonstration based on OMAC PackML and OPC UA standardization.
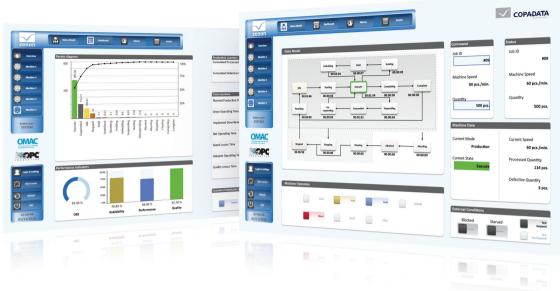
Figure 2: OMAC PackML-based line supervision and performance analysis.

re-building or changing the lines, which can happen frequently. In addition, we also see PackML on OPC-UA or even MQTT as the natural carrier of data from the shop floor directly to the cloud. This cloud might be an Arla-specific big data cloud, but in parallel with this, it could also be a cloud operated by the machine suppliers. Machine data can thereby be used by Arla Foods for our optimisation purposes. And we can also share it with machine builders, so that our machine data feeds into our suppliers' global initiatives to improve machine performance and technology.

In this context, what is your message for the industrial technology suppliers?

For us, it is very important to have a functional eco-system around PackML. We encourage technology suppliers to keep active within this context. Initially, we'd like them to make sure their controllers are PackML-ready and even OPC UA-ready in the short term. Second, we'd like them to deliver standard PackML code blocks, tested against PackML line controllers. And, finally, to spread the message via their channels. Since OMAC is a volunteer organisation, we lack the marketing funds to reach all potential users, so technology suppliers will play an important role here.

At the start of 2017, we are seeing a significant momentum building and we are gaining support from all significant automation suppliers and MES suppliers in the market. OMAC is the place where technology suppliers meet to agree on the future direction of development, in close cooperation with industry-leading manufacturers.

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PackML an **OMAC** standard
OMAC.org

How is zenon supporting the PackML standardization?
Just follow this link to our webpage:

www.copadata.com/omac