Machine Connectivity 4.0

# Highly diverse machine facilities connected simply and digitally

Episode 2

# Assembly line



## EXECUTIVE VIEW

Smart Factory processes (known increasingly under the term Industry 4.0) pass through several stages: connectivity, visibility, transparency, predictions, adaptability all the way to digital services complementing the production processes. This applies in particular to “brownfield” plants, i.e. existing machine facilities: At the heart of it all is connectivity. This must be incorporated in a holistic OT/IT architecture right from the outset. FORCAM and SAP offer this holistic architecture with the SAP Digital Manufacturing Cloud.

In six articles for common machine types, we outline how companies can use the FORCAM FORCE™ EDGE connectivity layer to connect all machines – regardless of manufacturer, vintage or control system – and process the data in the SAP DMC (Digital Manufacturing Cloud) or SAP ME/MII.

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## PART 2: ASSEMBLY LINE

Factory assembly lines involve highly complex processes – from the delivery of raw materials and parts to actual assembly, painting and coating work, storage and delivery. Accordingly, assembly lines come in all shapes and sizes. As a result, installing and running an assembly line calls for sophisticated planning of workflows and logistics. Cloud-based, data-driven manufacturing offers the greatest benefits.

To simplify matters, the following example of an assembly line assumes that it is composed of a succession of manual assembly lines representing a logical progression.


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## DATA INPUTS

As per standard practice when designing assembly lines, attention must be given to where data is to be obtained. It is possible to

- collect the data at each individual assembly stage via a corresponding work center control system

or

- acquire the collected information only at the end of the assembly process via a master controller.

In the case in hand, acquiring the data via a master controller is much easier in terms of overall implementation than entering it at each individual work center.

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## SCHEDULE OF THE SERIES

| | |
|---|---|
| Episode 1: Presses | (14th Jan 2021) |
| Episode 2: Assembly Line | (21st Jan 2021) |
| Episode 3: Palett Machine | (28th Jan 2021) |
| Episode 4: NC Machine | (04th Feb 2021) |
| Episode 5: Energy Monitoring | (11th Feb 2021) |
| Episode 6: Traceability | (17th Feb 2021) |

## MANUAL ASSEMBLY WORK CENTER

When planning the target architecture of a manual assembly work center, attention must be paid to the relevant quality gates in the assembly process and how this information is to be incorporated into the overall assessment of the work output. Furthermore, the selection of suitable plug-ins for communication with the individual control systems at the work centers finds its way into the target architecture.

The work center control systems or the master controller send data via the plug-ins to the Edge module “FORCAM FORCE™ EDGE Machine Connectivity and Model”. There, the received data is collated into a semantic data model, i.e. each signal is given its specific meaning. This semantically prepared information is then transferred via standardized machine events to a superordinate third-party system, for example the SAP DMC (Digital Manufacturing Cloud) or SAP ME/MII.

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