

TECH OFFER

Middleware for Non-Intrusive Integration of Equipment in Manufacturing Environment



KEY INFORMATION

TECHNOLOGY CATEGORY:

Infocomm - Networks & Communications

Infocomm - Robotics & Automation

Manufacturing - Assembly, Automation & Robotics

TECHNOLOGY READINESS LEVEL (TRL): **TRL6**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO116275**

OVERVIEW

Integration of different machinery to the MES systems and facilitating interaction between them is a common theme in Industry 4.0 implementation. This task can become complicated due to the presence of multiple vendors and legacy systems on the production floor. This invention is a software stack which can be classified as a middleware or control software. The middleware offers an intermediary communication for the different standalone machines to communicate and perform synchronised functions. The system can further be customised to extend its functionality to suit an end user's needs.

TECHNOLOGY FEATURES & SPECIFICATIONS

The middleware was developed to integrate robotic and automation elements allowing different machines to communicate through the middleware console. This is a set of customisable software code developed for the purpose of communicating

through the interfacing ports with different machines.

- Customisation for the disparate systems
- Options to connect by augmenting existing systems through sensorisation of systems.
- Allows heterogeneous systems to operate with customisation.

POTENTIAL APPLICATIONS

The middleware can be used in any production floor to allow easy and non intrusive integration for synchronised operations. The solution also allows integration of legacy systems, with no existing capability, to common Manufacturing Execution Systems (MES). This is a critical step for adoption of Industry 4.0 standards and consequently adding a capability to make data driven decisions in the production floor. The technology is customizable and can be adopted to different scenarios regarding MES integration and synchronised functioning of equipment.

MARKET TRENDS & OPPORTUNITIES

Industry 4.0 has made sweeping changes to how products are manufactured and production floors are managed. One of the challenges in the adoption which still exists, is the presence of expensive but legacy systems which cannot be easily replaced. In Singapore, manufacturing sector accounts for close to one fifth of the GDP. To modernise the manufacturing sector, the problem of integration needs to be solved as it is not always feasible to replace a legacy production capable system with a new one.

UNIQUE VALUE PROPOSITION

The middleware was developed to integrate robotic and automation elements allowing different machines to communicate through the middleware console. This is a set of customisable software code developed for the purpose of communicating through the interfacing ports with different machines.

- Allows digitalization on legacy systems not conforming to the standard MES requirements.
- System works separately on the edge and together with capability to integrate additional sensor inputs, it can provide data to a database or provide OPC UA compatibility for use by the MES.
- Allows non-intrusive sensorization for different brands of equipment.