Digital Manufacturing for Welding and Joining Technologies

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TWI Welding Systems Integration

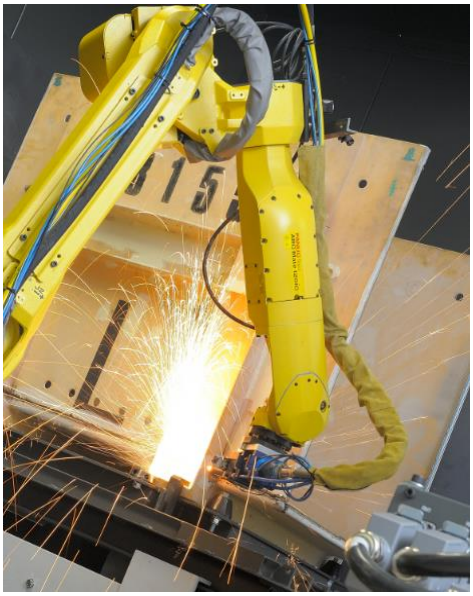
TWI is one of the world's foremost independent research and technology organisations, with expertise in materials joining and engineering processes as applied in industry. TWI specialises in innovation, knowledge transfer and in solving problems across all aspects of manufacturing, fabrication and whole-life integrity management.

The aim of the Welding Systems Integration (WSI) team is to provide the next generation of **Smart Autonomous Digital Welding Systems** based upon TWI's world-class process knowledge, developed within the context of the latest digital manufacturing philosophies underpinned by Industry 4.0.

WSI Offerings

Independent, comprehensive offering with an innovative manufacturing systems based approach. Supporting a wide range of welding, joining and associated repair technologies, materials, manufacturing systems integration activities and product certification. Focused on solving complex industrial challenges in the digital age:

- Systems integration research and development
  - Sensing equipment selection and deployment
  - The development of system demonstrators
  - Optimal parameter investigations.
- Production support, and technology gap analysis
- Independent specification and design of automated systems and options for innovation
- Consultation focused around Industry 4.0 concepts (Digital awareness, big data analytics, connectivity)
- Digital collaborative concepts, consortium building and submission management via the Joining 4.0 Innovation Centre 'J4IC'.



Source: TWI Ltd

WSI Project Case Study (1)

Industrial challenge

Request for the method of procurement for the acquisition of a state-of-the-art digital welding production system.

TWI response

A turnkey, end-to-end specification in the form of a report covering:

1. An in-depth understanding of the users digital manufacturing requirements
2. Fit for purpose hardware and software supplier reviews and down selection
3. Welding process knowledge and training support
4. Ongoing support throughout the systems integration, programming, FATs, SATs, commissioning, design of experiments (parameter development), and training.

WSI Project Example (2)

Industrial challenge

Request to review a shop floor 'low volume high value manufacturing' production system, and provide an independent review and gap analysis for the implementation of innovative smart sensing solutions.

TWI response:

An independent in-depth report outlining sensor selection and key process variable identification for an in-process monitoring system, which would enable the detection and ultimately the prevention of faults. Implementation of the above system would lead to an increased productivity enabling an estimated 80% increase in operational equipment effectiveness, leading to a potential time saving of 120 minutes / per shift.

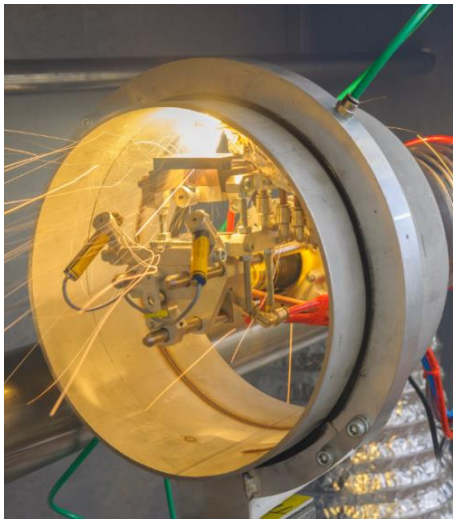
Grow Industry 4.0

The **GrowIn 4.0** Interreg North Sea Region collaborative project, **aims to build strong Industry 4.0 competences and tools for the benefit of manufacturing SME's**.

The UK delivery partners are TWI, Anglia Ruskin University, Greater Cambridge and Peterborough Local Enterprise Partnership. Our objectives are to (1)**Study digitisation best practices** across manufacturing SMEs, (2)**Engage with SMEs** (3)**Support business strategy** and **tool implementation**.

Source: TWI Ltd

To get involved Please get in touch for further details and SME participation options.



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Joining 4.0 Innovation Centre

a strategic partnership between TWI and Lancaster University

J4IC aims

The Centre aims to develop a research facility and draw on Lancaster's existing research strengths within engineering, data science and computing, with TWI's world leading knowhow in joining technologies to create, develop and embed transformative manufacturing capabilities for the benefit of industry. Contact details below for digital collaborative concepts, consortium building and submission management.

J4IC core areas

- Digitalised manufacturing capabilities based on advanced joining technologies
- Underpinned with expert joining knowhow, data centric engineering, software platforms, cloud computing, advanced systems connectivity, robotics and communications solutions

J4IC objectives

- To be world-leading and industrially relevant in the R&D of digital manufacturing capabilities based on advanced joining and associated technologies
- To create a successful collaborative environment between HEI-RTO-industry with substantial research, technology impact and adoption by industry
- To establish an excellent research environment underpinned by MSc, PhD researchers and academic staff embedded by industry
- Secure a portfolio of research funding from public funding bodies

Contact us

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