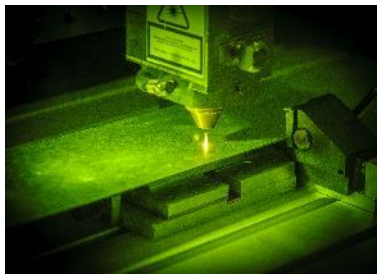
Joining Sub-Platform to Manufuture

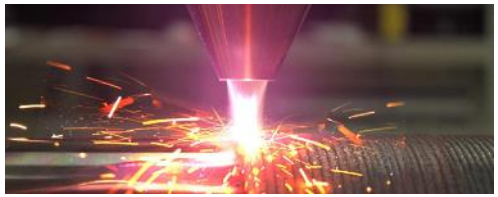
Development and Pilot Line Validation of a Modular re-configurable Laser Process Head

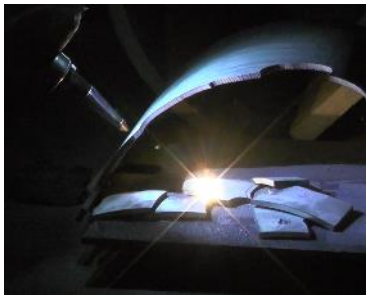
ModuLase



Paola De Bono – TWI Ltd

16th November 2017





Introduction to the Project

- H2020-FOF-13-2016 call
- Factories of the Future: Photonics Laser-based production
- Start date: 1st September 2016
- Duration: 36 months
- Received EC funding: €2,458,465 (€2,184,565 Grant)
- Programme directly focused on “Rapid individualised laser-based production”

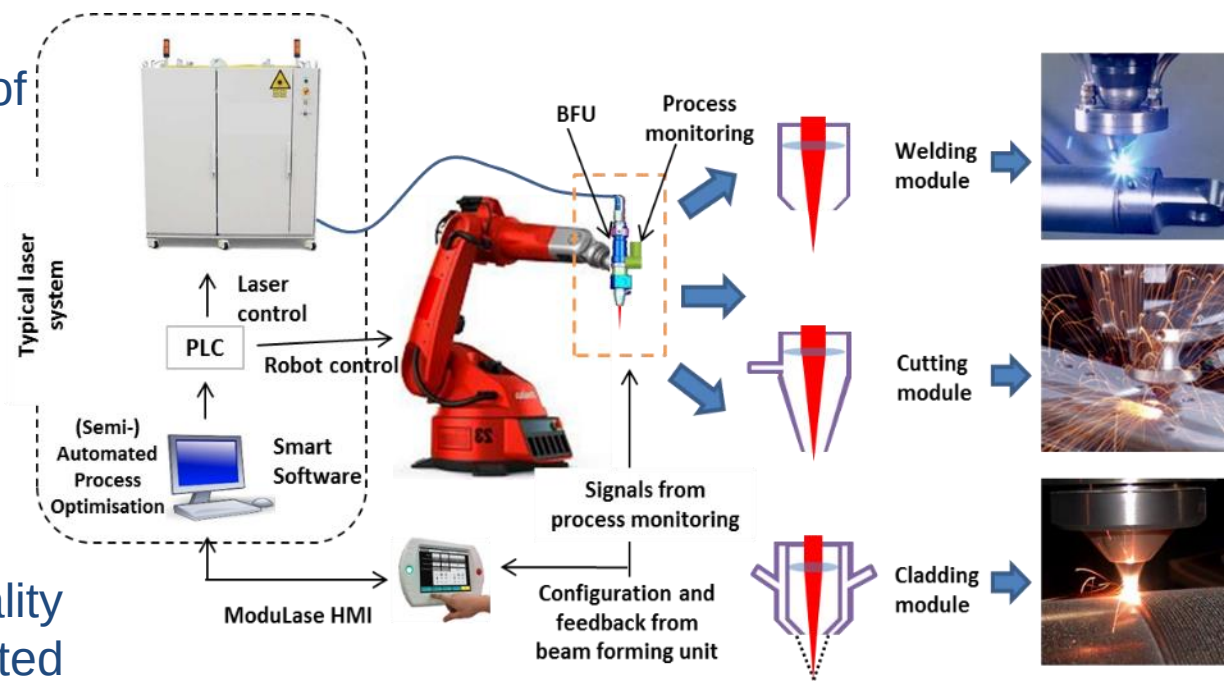
PHOTONICS PUBLIC PRIVATE PARTNERSHIP

The ModuLase project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No. H2020–FoF-2016- 723945-ModuLase. The project is an initiative of the Photonics and Factories of the Future Public Private Partnerships’

ModuLase Overall Objectives

The ModuLase project will:

- Develop a processing head covering welding, cladding and cutting, through the use of three modular end-effectors and re-configurable optics
- Include intelligent sensor technologies for in-process monitoring
- Be linked to an intelligent system, in order to achieve adaptive process control, quality assurance, and semi-automated process parameter configuration



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MODULAR LASER PROCESS HEAD

The ModuLase Consortium

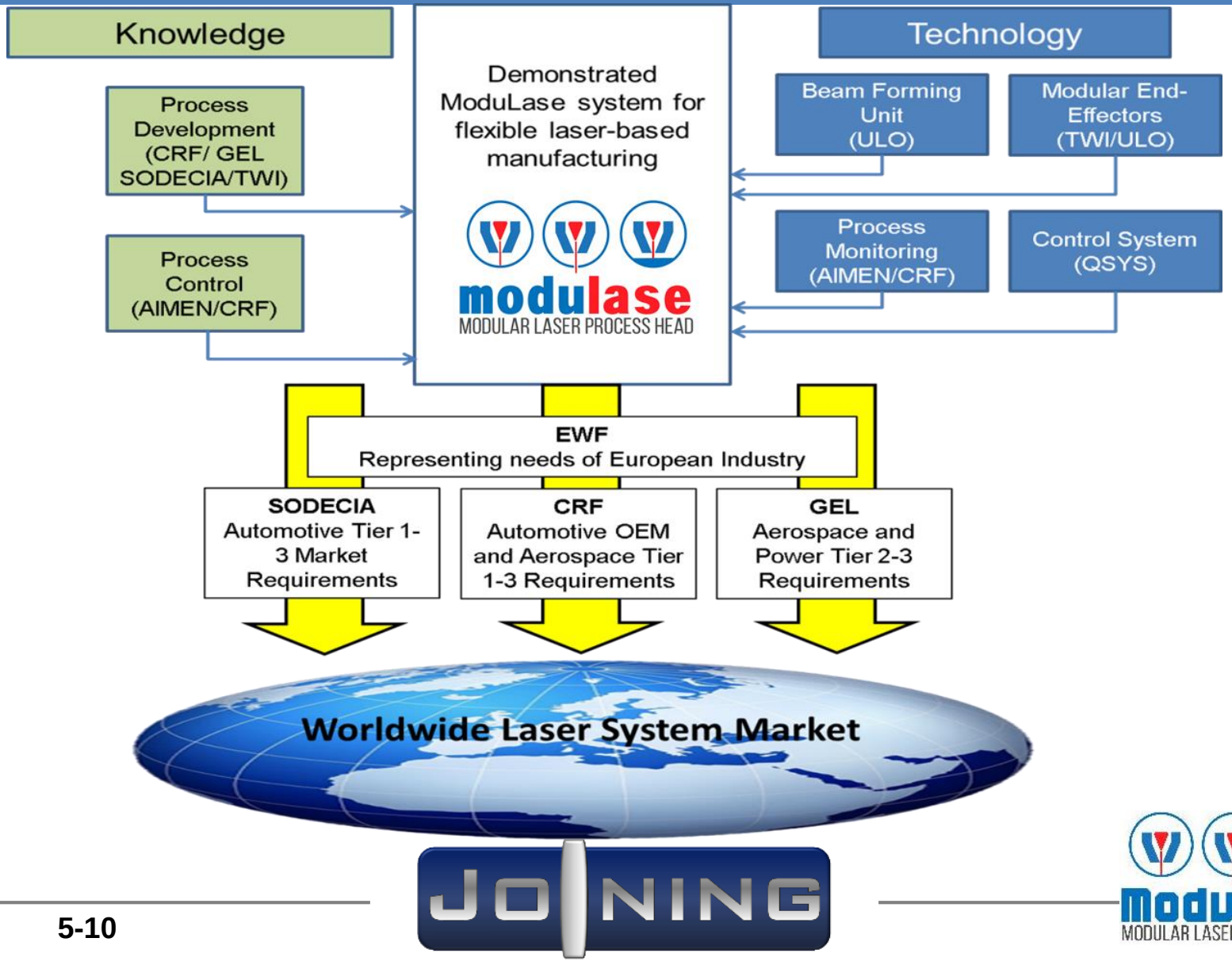
- 8 participants from 4 countries
- 50% RTO, 25%SMEs and 25%LEs
- End users within the power, aerospace and automotive sectors

Activities	Consortium
Beam Forming Unit	ULO Optics
End Effectors	TWI, ULO Optics
Process monitoring and quality control	aimen, CRF
Laser processing development and validation	TWI
User friendly Operating/User interface	Q-Sys
Representing needs of European Industry	EWF
Automotive, power and Aerospace applications	CRF, Graham, SODECIA

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ModuLase Technologies & Industry Focus



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ModuLase Technologies

Beam Forming Unit (BFU):

- Adaptable optical elements capable of delivering a wide range of laser beam energy distributions, suitable for welding, cutting and cladding applications
- A range of high-value goods, e.g. those made from advanced materials (advanced alloy steel, titanium, aluminium, etc.) will be covered

End-effectors:

- Three rapidly interchangeable end-effectors to cover welding, cutting and cladding applications
- Plug and play system to allow them to be changed on the end of the process head within a time of 1minute

ModuLase Technologies

Process monitoring and quality control:

- A process monitoring system suitable for welding, cladding and cutting processes will be developed
- It will be embedded into the ModuLase system, in order to assure process stability and also enabling to reduce additional time and costs involved in the process

User friendly Operating/User interface:

- The ModuLase system will comprise an user friendly HMI interface, enabling to input the material grade, its thickness and the laser process required
- Both the Quality Assurance System and BFU shall adjust vision and optical configurations and deliver the beam accordingly with minimal user contact

Summary of Key Deliverables

- Three end effectors manufactured for cutting, welding and cladding
- BFU manufactured
- Embedded Process Monitoring assembled
- Validation of ModuLase system (BFU + end effectors + process monitoring)
- System and software integrated with new knowledge gained from TWI trials
- Final Demonstration of the ModuLase system in industrial environment and to an industrial audience

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Expected Outcome from ModuLase

- **Reduced capital investment costs:**
  - End-users will save as much as 59% when installing the ModuLase head (with three end-effectors considered in this project)
  - Higher savings possible for organisations adopting more end-effectors

- **Maximise laser equipment utilisation rates by reducing down-time:**
  - Anticipated changeover time of <1 minute for the proposed ModuLase process head
  - Improved utilisation rates

- **Reduced running costs:**
  - Reconfiguring the BFU to match the required beam configuration will save time and cost
  - The integrated process control and monitoring system also helps minimise, if not eliminate, defects and therefore save on re-work or scrappage

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MODULAR LASER PROCESS HEAD

ModuLase Project Information

Further information available at:

http://www.modulase.eu/

Project coordinator contact details:

Dr Paola De Bono

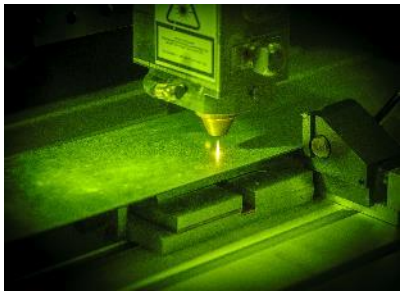
TWI Ltd, Granta Park, Cambridge, CB21 6AL, UK

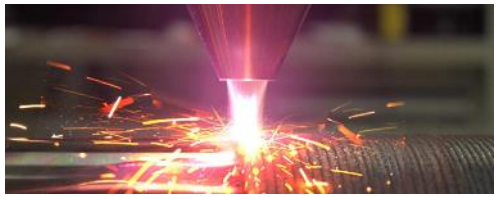
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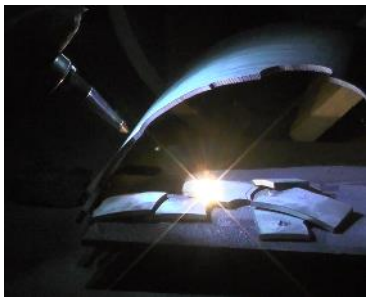
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