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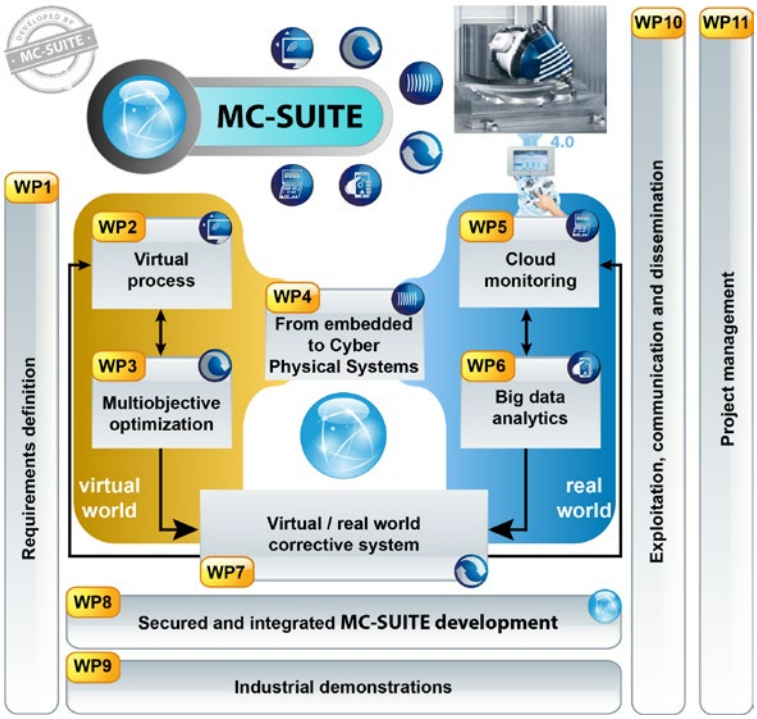
MC-SUITE - ICT POWERED MACHINING SOFTWARE SUITE

> PROJECT OBJECTIVE

Advances in Information and Communication Technology (ICT) are revolutionizing our everyday life. However, the manufacturing industry has not yet taken full advantage of this huge potential. The objective of the MC-SUITE project is to transfer advanced technology solutions from leading edge machine manufactures and universities to manufacturing companies especially SMEs.



The MC-SUITE project proposes a new generation of ICT enabled process simulation and optimisation tools enhanced by physical measurements and monitoring. The scope is to increase the competence of the European manufacturing industry, reducing the gap between the programmed process and the real part.

> CASE STUDIES

The industrial impact and relevance of the MC-SUITE project will be established through the development of industrial demonstrators:

- Demonstrator one will represent the automotive sector aiming at gearbox machining for robust process optimisation, fast adaptation and ramp-up.
- Demonstrator two will represent the general industry focusing on system integration of MC-SUITE for large workpieces.
- Demonstrator three will represent aerospace industry and will facilitate the application of MC-SUITE for this sector.

The purpose of these three demonstrators will be to ensure that specific requirements of the target sectors will be addressed by the MC-SUITE project and to showcase technological innovations the European manufacturing industry will benefit from.

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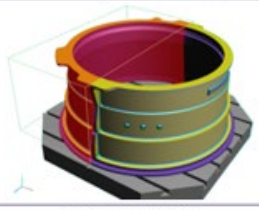
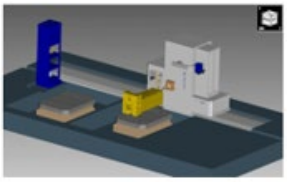
	Demonstrator 1	Demonstrator 2	Demonstrator 3
Sector	DIAD GROUP	SORALUCE	AEROMEC
	Automotive	Large parts manufacturing	Aerospace
	TRL 7	TRL 7	TRL 7
Part	Gearbox casing	Machine tool column	turbine casing
	Aluminium (AlSi9)	Cast iron (FG 30)	Jetethe (Stainless Steel)
			
Machine	FIDIA VSE1066	SORALUCE FR12000	SORALUCE FL3000
			
.	MC-SUITE excluding MC-CyPhy will be demonstrated	Complete MC-SUITE will be demonstrated	Complete MC-SUITE will be demonstrated

> Cedrat Technologies contribution

Within the framework of the MC-SUITE project, Cedrat Technologies has developed force feedback systems. During machining operations, forces from the cutting operation are transferred to the workpiece, understanding the magnitude, and directions of these forces allows optimisation of the cutting process. This in turn, increases cutting removal rates, improves cutting precision and enhances surface finishes.

> Force feedback systems

Stand-alone force feedback systems are currently available from a number of companies, however due to the inherent requirement of being both very stiff, and precise, existing systems are based around piezo technology. The objective for Cedrat Technologies is to develop force feedback systems based around Electro Capacitive Sensing (ECS) technology. ECS technology has a number of advantages, however to date has lacked the ability to equal the precision of piezo. Cedrat Technologies has developed a system that is capable of equalling existing product performance, while offering improvements in static measurements and global cost reduction.

> Cedrat Technologies – Product development

Three products will be brought to market within the frame of the MC-SUITE project:

- Single axis force feedback table

Capable of measuring forces in one direction only with a range of ±20kN, a resolution of 12N and accuracy of better than 50N at 1kHz the table has dimensions of diameter 100mm and a height of 70mm.

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- Single axis force feedback tool holder

The tool holder has been developed to measure forces during drilling operations, especially adapted to take large diameter drill (>50mm), it will measure forces up to 20kN.

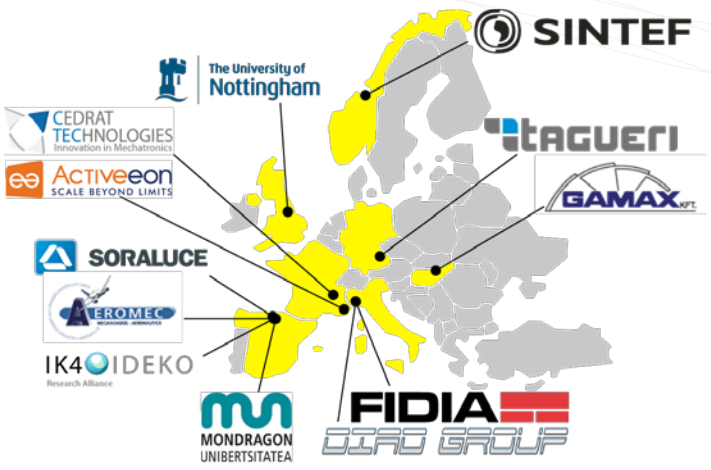
- Three axis force feedback table

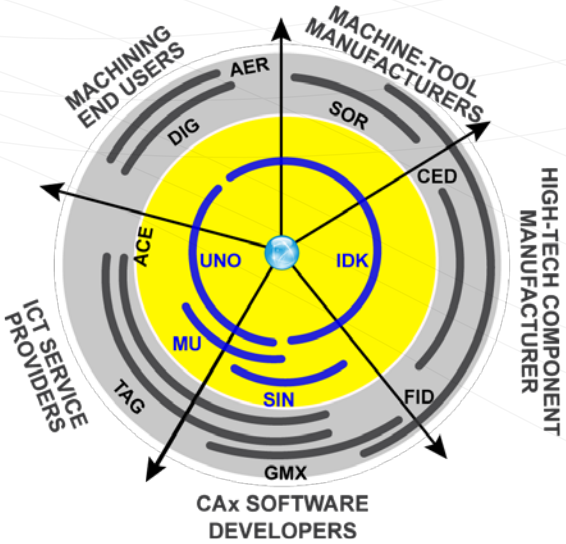
Capable of measuring forces up to 60kN, and operating in three direction simultaneously, the table has a size of 260mm x 2600 and height of 95mm.

> PROJECT PARTNERS

The combination of manufacturing, Information & Communication Technologies (ICT) partners is at the core of the construction of the consortium resulting in an exact balance between ICT and manufactures. The consortium assembled for this 36-month project consists of a unique combination of skills and expertise including 6 SMEs, 2 universities, 2 research centres and 2 large companies. Hence, this consortium covers all the value chain of the manufacturing products including software providers, equipment providers, machine tool builders and end users.

ACTIVEEON	AEROMEC	CEDRAT TECHNOLOGIES	DIAD GROUP
FIDIA	IK4-IDEKO	MONDRAGON UNIVERSITY	SINTEF
SORALUCE	TAGUERI	UNIVERSITY OF NOTTINGHAM	GAMAX





The European interdisciplinary approach of MC-SUITE

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