Modular Intelligent Hydraulics

Reporting

Project Information

MIDRAULICS

Grant agreement ID: 779020

Project website

DOI
10.3030/779020

Project closed

EC signature date
3 August 2017

Start date
1 September 2017

End date
30 September 2020

Funded under
SOCIETAL CHALLENGES - Smart, Green And Integrated Transport

Total cost
€ 1 290 523,75

EU contribution
€ 903 366,63

Coordinated by
HYDRONIT SRL
Italy

Periodic Reporting for period 3 - MIDRAULICS (Modular Intelligent Hydraulics)

Reporting period: 2019-09-01 to 2020-09-30

Summary of the context and overall objectives of the project

HYDRONIT is a company established in 2003 whose core business focuses on research, development and production of smart modular hydraulic power packs and relevant components for the mobile industry, for which we strive for excellence. We operate in 50+ countries with daughter companies located in China, the UK and the US. Our passion for hydraulics power and our

commitment with our customers let us reach €4,5 million turnover in 2017, 60% of which coming from exports (as of 2018 Q2, we project 10% growth for 2017, which will let us achieve € 5.0 million turnover). Hydronit has always pursued a full new concept of hydraulics consisting on building compact modular solutions that integrates all necessary pieces of knowledge (electric/electronics on top of hydraulics), removing the need to resort to multiple subcontracts to produce the final equipment: a ONE STOP SHOP solution for Industry 4.0 machines. Following this philosophy, we have been developing MIDRAULICS, a connected IoT hydraulic power pack for the mobile industry (e.g. industrial, construction and agricultural vehicles and equipment). MIDRAULICS will provide our customers in the mobile application sector: 1. Full distributed hydraulics and electronics for new machine architectures: lighter, cost effective, available. 2. Machine safety thanks to a SIL2 certified solution of control and power; 3. Consistent energy saving, as a results of the following factors: 86% less material for wiring; 10 % electric power savings in on-off applications thanks to start stop features; 30% electric power savings in variable speed applications through use of Inverters and brushless motors. Environmental friendliness, thanks to reduction of weight and overall dimensions, Cable harnesses reduction (through short distance between PLC and actuators and use of wireless or fieldbus communications) Thanks to MIDRAULICS, we expect to activate new generation of customers generating new business for €6.87 million accumulative revenues during the first 5 years of business achieving a RoI ≥ 1.58.

Work performed from the beginning of the project to the end of the period covered by the report and main results achieved so far

The MIDRAULICS project requires the use of electronics and electronic related specialities within a company specialised in hydraulics (which is mainly mechanics). This has been the real only challenge of the complete period.
Electronic and Mechanics has subjected to completely different timing and time schedules were respected, but slightly reorganized.
The main activities of the projects have been:
TECHNICAL ACTIVITES:
• identifying a location for the mechatronic department.
• installing furniture and finding personnel (software and mechanic engineers),
• defining technical specifications for mechanics:
◦ main hydraulic collector,
◦ mechatronic cover of the electronic board,
◦ special drive shaft,
◦ 3way-pressure compensator,
◦ sensor installation screw,
• defining technical specification for the electronic:
◦ I/O list, safety and fieldbuses requirements,
◦ define overall dimensions to match with the mechanics (and vice versa),
• coordinating activities of internal co-operators and external subcontractors,
• producing static and dynamic prototypes of the mechanic part,
• producing a working electronic controller able to fit inside the limiter room of the mechanics,

• producing a working firmware and libraries in order the electronics to work as planned,
• producing an application software to start test and trials.

All the above-mentioned activities have been executed and have been successful: the results will be exposed from 23 to 26 November 2018 in SPS Drive trade fair in Hannover.

COMMERCIAL ACTIVITIES:
• registering a specific brand for the new offer,
• activating a specific website and web domain, including sales and support e-mail,
• creating a conference room in Hydronit's facilities and related furniture,
• Obtain international patent
• creating keynotes for presentations,
• editing and printing a complete catalogue including the complete MIDRAULICS ecosystem,
• selecting and apply for trade fairs,
• starting sales-engineers formation,
• visiting dealers and OEM.
• Start SALES!
Apart those activities already launched and completed above, few strategy adjustment was needed to focalize the attention of the customers and potential customers on the application of this technology: all sales documents now clearly identify eleven domain of application which make easier the dialog with OEMs (which are the main target of Midraulics). We found that dissemination of Video over the most common social media platoforms returns good feedback from the OEM.
The first sales results arrived 2 months before grant closing: in just 3 months a total of 5 machines have been equipped and commissioned with MIDRAULICS, 4 went to Malaysia, one is in Germany: this is a clear sign that MIDRAULICS is to be considered a solution where time to market is fundamental for the customer. Just this 5 MIDRAULICS has generated more than 30K€ of incoming.

Progress beyond the state of the art and expected potential impact (including the socio-economic impact and the wider societal implications of the project so far)

MIDRAULICS introduces the first generation of "Industry 4.0 hydraulic power pack", where motors, pumps, valves, pressure and flow sensors, amplifiers, drivers, gateways, processors and software lives in one device. The importance of this project goes beyond the specific business opportunity as this is the perfect opportunity to position ourselves as the worldwide reference provider of hydraulic mechatronic solutions for the targeted hydraulic segments, starting with our primary focus: machine safety and quality driven hydraulic segments, which will definitely boost our growth.
The first year of activities in MIDRAULICS project is closed and it is finally possible to sum up the activities as: it works, it is producible, and it is sealable.
More details will follow in the next pages but, in few words, the first period of the project allowed Hydronit to acquire and apply new skills in electronic applied to hydraulics. In order to do so, we have introduced a new team of technicians within a new structure called "mechatronic department", which is in charge of the project itself and start the design.

For the first time in the history of our company, a complete design concept has been adopted: mechatronics as a whole single project, which means mechanic (hydraulic) as a service of the electronic, and electronic as a booster of the mechanic part. Power and logic together for the first time in the history of the mini and micro-powerpack. Somebody told “power is nothing without control”. After three years of work We did it. Midraulics has been installed commissioned and payed by two innovative OEM engaged in different sectors: Heavy Clay and Dock Arm sectors that has almost nothing in common..encouraging us to follow both stationary and mobile industry segment.

Mechatronic department

Scheda eletronicca SPU

Production area

3D printed 1:1 scale parts of Midraulics

XDRAULICS Hydronit

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