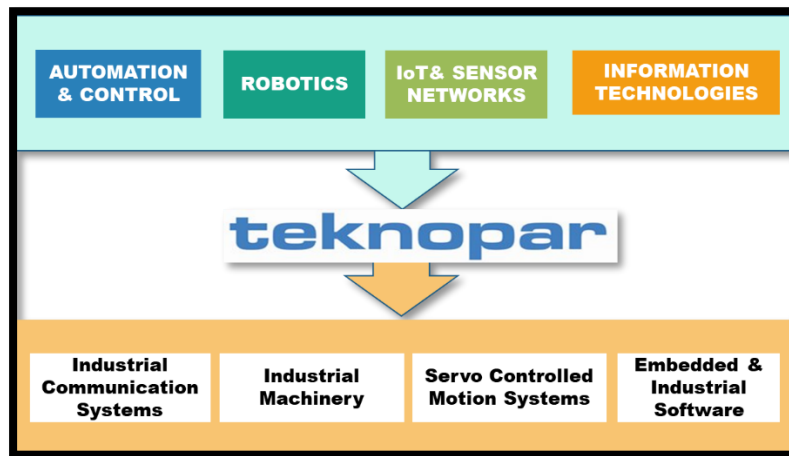


Expression of Interest

TEKNOPAR is an R&D performing SME founded in 1996 and it is one of the leading providers of automation systems and solutions in Turkey for industrial facilities, energy and mobility sectors. Through the development of its engineering and production infrastructure, the company has extended its sphere of activity to provide customers with a wide range of services and end-to-end solutions where integrated applications of mechatronics, automation, electric-electronics, and information technologies have been supplied. The company incorporates control, automation and robotics technologies with information technologies and provides industrial communication systems, servo-controlled motion systems, embedded software&industrial software with service-oriented architecture and data processing platforms.

Expertise:



IoT and Sensor Networks

- On-site installation of the sensors, machines and systems
- Condition Monitoring Systems
- M2M/ Internet of Things (HTTP/MQTT/AMQP/..)
- IIoT & Narrow Band IoT (NB-IoT /LoraWAN/ SigFox/..)
- OPC UA, B2MML, PLCopen OPC UA

Automation and Control Systems

- PLC, SCADA, HMI
- Industrial Communication System design: PROFINET, PROFIBUS, AS-i, DeviceNet
- Servo Controlled Motion Systems: SIMOTION, SINAMICS, CODESYS
- Hydraulics and pneumatics systems

Robotics

- Material Handling and Transfer Systems: Conventional and fully-automated control of the transfer systems, MCC and control panels, SCADA and PLC software.
- Manufacturing Machinery: Fully or semi-autonomous machinery with automation and control systems
- Cable Robots - CONSTRUMATIC 4.0

Edge/Cloud Computation, Analytics and AI

- SoA/Middleware
- Edge/Cloud computation and analytics
- Artificial Intelligence, Machine Learning and Deep Learning
- Object recognition and anomaly detection

Selected Projects:

Cable Robot - CONSTRUMATIC 4.0 (EUREKA):

This is a project on intelligent productive system based on flexible robotic systems and 4.0 industry applied to the construction industry. Construmatic4.0 holds a novel idea which integrates new advanced manufacturing systems research and development, based those ones on the cable robotics and 4.0 industry technologies, and its later integration on the construction industry.

(<https://www.eurekanetwork.org/project/id/11720>)



T-X Vision Automatic Defect Detection for X-Ray Test Systems (TUBITAK):

Supported by The Scientific and Technological Research Council of Turkey, aim of the project is to detect welding defects in manufacturing environment through X-Ray test systems. TEKNOPAR developed imaging software that enables operators to easily notice defects as well as an automatic defect detection system. Convolutional Neural Networks and deep learning techniques for smart defect detection are applied for automatic defect detection. Streaming X-Ray image data is processed in testing environment and image processing techniques are used on retrieved frames. Image data retrieved on the client is posted to the smart defect detector server, and the predicted defect is sent to the client. TEKNOPAR has developed smart defect detection system using the open source technologies and tools like Python, OpenCV, CUDA, Tensorflow, Keras, Pandas, Matplotlib, Conda. The DICONDE compliant system has been the output of the project. (<http://teknopar.com.tr/urun/industrial-facilities/x-ray-test-systems/86>)

Ultrasonic Testing Systems (TEKNOPARK):

Machinery in industrial facilities are equipped with smart sensors for automation of the factory as well as real time smart monitoring and testing. OPC UA and PLC are used to obtain sensor data and it is transferred into industrial internet and servers inside facilities and visualized with SCADA and web technologies for maintenance and monitoring. The DICONDE compliant ultrasonic test system is designed and developed by TEKNOPAR in this project. (<http://teknopar.com.tr/urun/industrial-facilities/ultrasonic-test-systems/85>)

MACHINAIDE (ITEA):

Machine builders are collecting data related to their products within different formats and tools since several years. The number of related Digital Twins increases each time, products of other manufacturers become included in the own one, or in case of acquiring other companies. For coping with this development, MACHINAIDE aims to support innovative concepts for accessing, searching, analysing and using multiple Digital Twins data for the major purpose of increasing usability and functional upgrading of machines and equipment within the crane and printing machine domains. (<https://itea3.org/project/machinaide.html>)

COGNITWIN **COGNITWIN** (H2020):

COGNITWIN solution platform includes a sensor network that will continuously monitor and collect data from various plant processes and assets which will be stored at a database. This data will be used to develop a digital twin of the process and will also be used to develop models with cognitive capability for self-learning and predictive maintenance which will lead towards optimal plant operations. (<https://cordis.europa.eu/project/rcn/224854/factsheet/en>)

The FLOW-CAM (Floating Offshore Wind Turbine Cable Monitoring) project aims to detect and monitor the structural and operational conditions of underwater cables of offshore wind turbines. Mechanical, electrical and thermal damage mechanisms of underwater cables will be inspected with the multi-physics model to be developed by two project partners from Turkey and three project partners from France. By generating new models for failures, new Structural Health Monitoring (SHM) will be developed, based on the use of multi-sensing systems, underwater remotely operated vehicle and AI-based data analytics. (<https://teknopar.com.tr/arge/flow-cam-martera-era-net/12>)

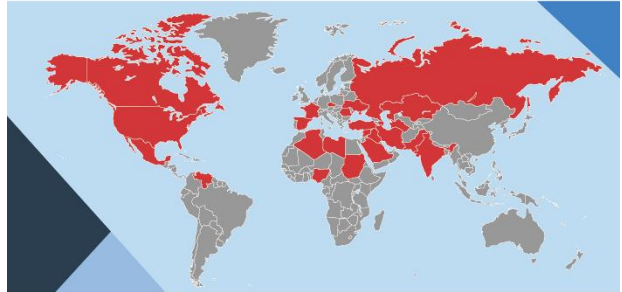
H2020 initiatives involved:

TEKNOPAR has been a member of the following EU Initiatives:

- H2020 Expert Advisory Group "Innovation in SMEs"
- Big Data Value Association (BDVA)
- Vision 2020
- European Factories of the Future research Association (EFFRA)
- Eureka Cluster for Smart Advanced Manufacturing Program

Selected References:

Company	Country
ARCELOR MITTAL	Czechia
NOKSEL	Spain
ORMAZABAL	Spain
RATNAMANI	India
HANSON	USA
IMPERIAL STEEL	USA
AMERON	USA
AMERICAN PIPE	USA
SOFRATEST	France
ÇİMTAŞ	Turkey
BORUSAN	Turkey
ASELSAN	Turkey
BECHTEL-CLUJ	Romania
TZINOROT	Israel
METCO	Israel



The company's references include over 500 projects in 27 countries worldwide.

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