1 PUBLISHABLE EXECUTIVE SUMMARY

1.1 SUMMARY DESCRIPTION OF PROJECT OBJECTIVES

The ARFLEX idea is to get a significant improvement of accuracy, flexibility and adaptability of the actual industrial robots by providing the industrial robot field with new technologies, such as advanced control theory, new sensor devices, electronic embedded systems. The consequence will be not only the robot performance enhancement in the current typical industrial applications, but also the extension of robotic system employment to the SME sector and to new applications, up to now performed only by costly and less flexible tooling machines, or whose requirements have been mostly satisfied by heavy, costly, difficult to reconfigure, mechanical solutions.
The ARFLEX project starts from the availability of industrial robots designed and realized according to the present status of the art without requiring any change of what exists. By means the application of new technologies ARFLEX aims at introducing a new higher level of control loop (*see Figure1*), that, starting from the measurements given by a new sensor system (ARFLEX sensors), generates a correcting command to be added to the present reference signal coming from the user interface. Through this "additive correction command" ARFLEX aims at obtaining the expected improvement of the robot performance.

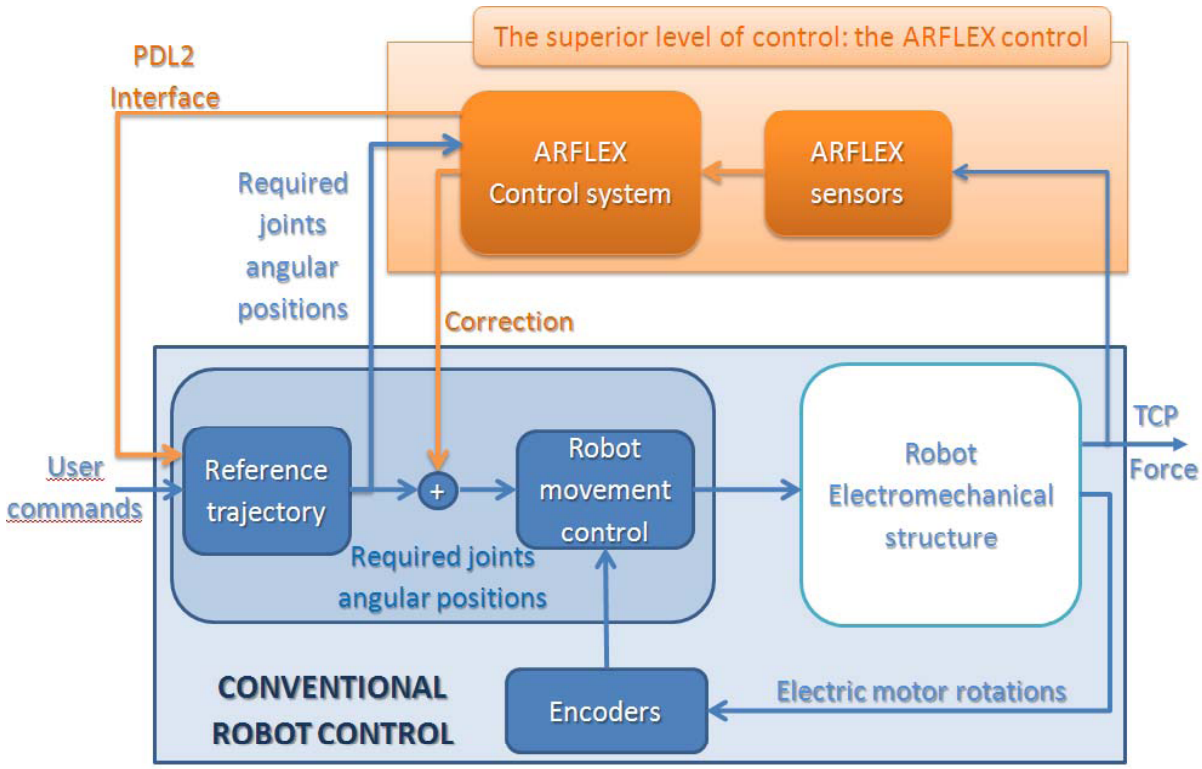

Figure 1. Functional scheme of the interaction between ARFLEX and conventional control

The above approach has been selected with the double purpose:

- to give evidence to the added value, that can be obtained through new technologies available today and not yet systematically applied in the field of industrial robots: they will be added to what already exists, in order to achieve the required improvements,

- to get the development of a new concept that should be quickly introduced and experimented at industrial level.

1.2 CONTRACTORS INVOLVED

PARTNER NAME	SHORT NAME	COUNTRY	ROLE IN THE PROJECT
EICAS Automazione S.p.A.	EICAS	Italy	Project coordinator
COMAU S.p.A.	COMAU	Italy	Industrial partner
Jozef Stefan Institute	JSI	Slovenia	R&D partner
Fraunhofer IPK-FHG	IPK	Germany	R&D partner
ZHW Institute of Mechatronic Systems	IMS	Switzerland	R&D partner
University of Antwerp	UA	Belgium	R&D partner
Actuation and Control Technologies S.r.l.	ACTUA	Italy	R&D partner

1.3 CO-ORDINATOR CONTACT DETAILS

The Project Co-ordinator is Dr. Gabriella Caporaletti of EICAS Automazione S.p.A.
The contact details are:

Telephone: +39 011 5623798 or +39 011 5623088
Fax: +39 011 4360679
E-mail: gabry@eicas.it

1.4 WORK PERFORMED

Introduction

The ARFLEX project (**A**daptive **R**obot for **FLEX**ible manufacturing systems - IST-NMP2-016680) has been funded by the European Community in the context of the Six Programme Frame with the aim to introduce a radical innovation to the existing industrial robots by means of the most advanced technologies in control theory, embedded systems, sensor devices and vision systems.
The ARFLEX Consortium is composed by seven partners, as showed in Figure 1: EICAS Automazione S.p.A (Project Coordinator, Italy), COMAU Robotics (Italy), ACTUA S.r.l (Italy), Jozef Stefan Institute (Slovenia), Institute of Mechatronic Systems (Switzerland), the University of Antwerp (Belgium) and the Fraunhofer Institut Produktionsanlagen und Konstruktionstechnik (Germany).