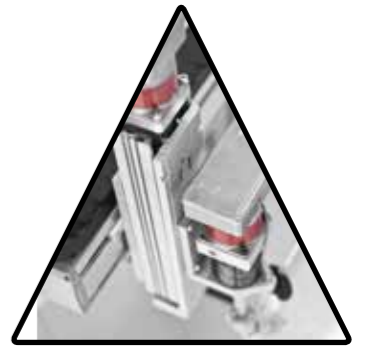# V TECH
smt ltd

alutec
ROBOTICS

GANTRY AND DESKTOP SOLUTIONS

alutec ROBOTICS

INDUSTRIAL AUTOMATION

ALUTEC Robotics is a division of **Alutec Group**, part of the group since 2016 after the acquisition of the **AEB Spa** business unit.

ALUTEC Robotics Business Unit, was formerly named AEB Robotics, is an internationally recognized reality for the **development and production of Cartesian robots desktop and gantry**, specialized also in the realization of **custom systems**.

With a know-how acquired in more than 10 years of field experience, we are able to develop **industrial automations** mainly in the world of **precision industrial dispensing**, such as fluid dispensing (glues, resins, silicones, etc.) or where there is a need to faithfully replicate the operator's manual skills in order to obtain the same quality with a robot in the finished product.

Thanks to the experience on the process and its control over the mechanics and realization of the assembly, Alutec Robotics is able to satisfy the customer's needs for the realization and development of the product assembly lines. Modular applications are the solution to minimize machine times, with a minimum size for assembly line.

Starting from a specific request of a customer, Alutec Robotics performs a **feasibility analysis**, **designs the machine and realizes the application**, always maintaining a close collaboration with the customer during all phases: the design phase, the supply of components, assembly and with the necessary support also in the post-sales phase.

Our goal is your success

Our goal is to offer the best **products** and **services** available on the market to satisfy all customer requirements and help to develop their business. Starting from a specific request from a customer, Alutec carries out a feasibility analysis, designs the machine and realize the application, always maintaining a close cooperation with the customer during all stages. **Professionalism** and **commitment** are Our features: for Alutec is very important to find the best solution to build trust in a customer relationship.

Consulting Service

Alutec consulting service follows customers from the beginning in finding the best possible solutions, with the aim to achieve the desired results.
It then goes on during conception and design, which may arise unexpected and innovative optimization, up to installation and maintenance, to ensure maximum customer satisfaction.
Is in the project that Alutec offers its experience for the development of reliable and efficient products and lines.
Experience, professionalism and high specialization make it possible to tackle every project in an unique and innovative way.
Our projects are not limited to structural and dimensional study, but ranging in choice and selection of materials and equipment most suited to best expression of the projects.

Design

Design studio is, for Alutec, the most important phase and it is followed accurately; our technical staff is at your disposal to realize your project, we start from an idea to create a product.
Our staff, thanks to the great experience in the field, can suggest the right solution to achieve the best possible result.
The project is defined between our consultants and the customer.
As a first step we study customer's need, after we realize a project with 3D rendering, this allows the customer to easily understand how the product will be realized.
The consolidated experience over the years and familiarity in the use of aluminum profiles and accessories, allows us to design unique lightweight and modular systems.

Manufacturing

Thanks to the teamwork and close cooperation among the departments, Alutec manufactures internally all its products, starting from the feasibility study, going from designing, choosing the raw materials up to the finished product material.

This perfectly organized internal supply chain, allows Alutec to guarantee quality, speed of execution and competitive prices.

milling

bending   assembly   cut

Location

Alutec S.r.l
via Mafalda di Savoia, 9
42124 Reggio Emilia - Italy
tel. +39 0522-512580
fax. +39 0522-512542

Alutec Service
via Salimbene da Parma, 2/B
42100 Reggio Emilia
(fraz. di Sesso) - Italy

Tecno-ind food
via Grandi, 5
43038 Sala Baganza (Parma) - Italy

Alutec Meccanica
via Amman, 8
33084 Cordenon (PN) - Italy

WR*a*500

3-4 axes system

The stand-alone Cartesian robots are the ideal solution for dispensing, milling, screwing and soldering applications, which must be highly flexible, simple to program and use and require limited investments. The new ALPHA electronics offer groundbreaking functions and performances, which are included even in the standard models.

WRa500 is a Cartesian robot with three and four interpolated axes and work area of 500x500mm; it is extremely flexible and ensures high precision and repeatability of the operations.

The mechanical part consists of screw axes with linear and rugged ball bearing guides and the self-bearing structure is made of aluminium profiles. **WRa500** is controlled by a **groundbreaking motion control system called ALPHA** by Alutec Group, which, combined with the proprietor software ALPHA, guarantees reference performances and new functions, for both stand-alone operation and for the communication of the robot with external systems (CANopen , serial RS232 or with 16 general purpose input/Outputs),

which are available even in the standard version. The robot is programmed from the PC and subsequently controlled via the operator panel ALPHA CP, supplied with it, and can manage up to 100.000 points split-up into 255 work programs.

The user-friendly graphic interface, the possibility to import files in .dxf, Gerber or Excel format and the new SUB-PROGRAMS function allow you to fulfil extremely complex operations, very quickly. As for the dispensing applications, the 3D interpolation, the continuous path function, the automatic calibration system and the high mechanical precision guarantee utmost execution quality. **WRa500** is supplied complete with safety guards and EC type-approvals.

Applications
p. 18-19

X/Y/Z {R} Work Area (mm)	500 / 500 / 145
Worktable Load / Tool {R}	10 Kg X / 5 Kg Y , (3 Kg) R
Max. Speed X,Y,Z	400 (mm/sec) MAX with protection
Repeatability	±0.015 mm/axis
Resolution	0.004 mm/axis
Pitch Screw	8 mm
Data Memory	100.000 Points / 255 programs
Drive System	stepper motors
Interpolation	point to point & continuous path
Programming Method	remote mode (self-learning) through PC software
I/O Signals	16 input / 16 output
External Interface	USB / RS232 /Analogue output optional
Power Supply	100-240 VAC, 50/60 Hz 500 Watts
Dimensions (WxDxH) mm	798x835x930
Weight	62 Kg

AXIS Z
AXIS Y
929,20
798

AXIS Z
AXIS R
POLSO OPTIONAL
AXIS X
835
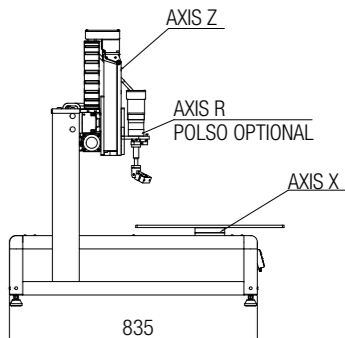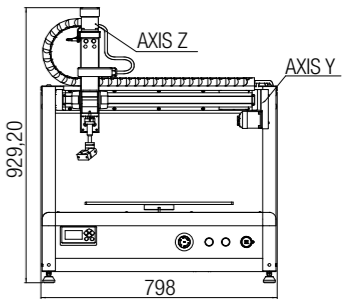
WR**a**300

3-4 axes system

The stand-alone Cartesian robots are the ideal solution for dispensing, milling, screwing and soldering applications, which must be highly flexible, simple to program and use and require limited investments. The ALPHA electronics offer groundbreaking functions and performances, which are included even in the standard models.

WRa300 is a Cartesian robot with three and four interpolated axes and work area of 320x320mm; it is extremely flexible and ensures high precision and repeatability of the operations.The mechanical part consists of screw axes with linear and rugged ball bearing guides and the self-bearing structure is made of aluminium profiles. **WRa300** is controlled by a **groundbreaking motion control system called ALPHA** by Alutec Group, which, combined with the proprietor software ALPHA, guarantees reference performances and new functions, for both stand-alone operation and for the communication of the robot with external systems (CANopen, serial RS232 or with 16 general purpose input/Outputs), which are available even in the standard version. The robot is programmed from the PC and subsequently controlled via the operator panel ALPHA CP, supplied with it, and can manage up to 100.000 points split-up into 255 work programs. The user-friendly graphic interface, the possibility to import files in .dxf, Gerber or Excel format and the new SUB-PROGRAMS function allow you to fulfil extremely complex operations, very quickly. As for the dispensing applications, the 3D interpolation, the continuous path function, the automatic calibration system and the high mechanical precision guarantee utmost execution quality. **WRa300** is supplied complete with safety guards and EC type-approvals.

Applications
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X/Y/Z {R} Work Area (mm)	300 / 300 / 145
Worktable Load / Tool {R}	10 Kg X / 5 Kg Y , (3 Kg) R
Max. Speed X,Y,Z	400 (mm/sec) MAX with protection
Repeatability	±0.015 mm/axis
Resolution	0.004 mm/axis
Pitch Screw	8 mm
Data Memory	100.000 Points / 255 programs
Drive System	stepper motors
Interpolation	point to point & continuous path
Programming Method	remote mode (self-learning) through PC software
I/O Signals	16 input / 16 output
External Interface	USB / RS232 /Analogue output optional
Power Supply	100-240 VAC, 50/60 Hz 500 Watts
Dimensions (WxDxH) mm	600x635x930
Weight	49 Kg

AXIS Z

AXIS Y

930

600

AXIS Z

AXIS R
POLSO OPTIONAL

AXIS X

635
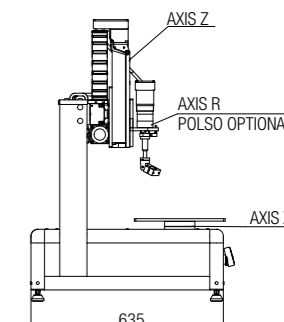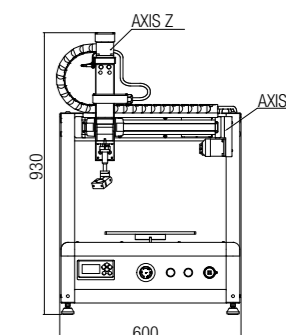
WRL300

Movimento 3 assi

The WRL300 Cartesian robot (WRL200) comprises a selfsupporting structure in 100% aluminium, offering high stability and great strength with minimum weight.

The movement is assured by a toothed belt, bearing guides on hardened shafts and bipolar stepper motor: these all help **WRL300** to combine the high precision and repetition of the belts and bearings with the high performance of the motors.

The **SW programming software** included, designed specifically for dispensing fluids, allows the operator to program even the most complex paths.

The **WRL300** front panel is also fitted not only with START and EMERGENCY operator buttons, but also a functional controller with built-in **display**, used to call up the main software functions, including program selection, program execu-tion controls, alarm display, input-output menu, etc.
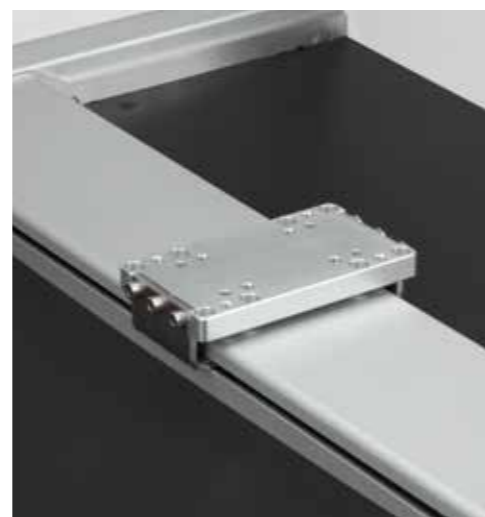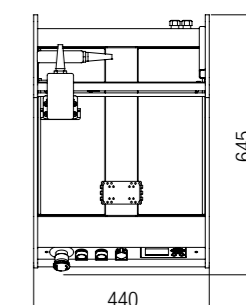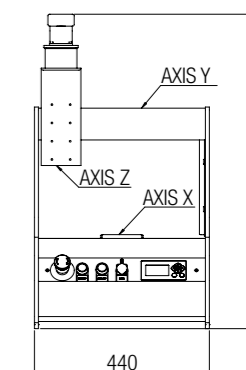
Furthermore, **2 digital inputs** and **4 digital outputs** are also available for connection to external devices (e.g. dispensing valves, level sensors, general enabling signals, etc.) which can be fully configured by the user.

Applications
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X/Y/Z {R} Work Area (mm)	300 / 300 / 140
Worktable Load / Tool {R}	5 Kg X, 1 Kg Y
Max. Speed X,Y,Z	1-250 mm/sec X, Y, 1-100mm/sec Z
Repeatability	±0,1 mm/axis
Resolution	0,08 mm/axis
Data Memory	100.000 Points / 255 programs
Drive System	stepper motors
Interpolation	point to point & continuous path
Programming Method	remote mode (self-learning) through PC software
I/O Signals	2 input digitali - 4 output digitali
External Interface	USB / RS232 /Analogue output optional
Power Supply	110/230Vac ±10% - 50/60Hz - 400VA
Dimensions (WxDxH) mm	440x645x800
Weight	32,7 Kg

AXIS Y
AXIS Z
AXIS X
800
440

645
440

Options available

4th axis wrist KIT

The wrist kit is used to vary the working angle of the tool on the robot's wrist. Thanks to this tool, it is possible to reach awkward processing points and to maintain a correct angle when dispensing rather viscous material. The wrist kit can be fitted on robots WRa300 and WRa500 of Alutec-Group. The system can work interpolated with the other three axes of the robot.

Optical protection barrier

Health & Safety module pursuant to EC standards. The structure is made of anodized aluminium profiles and polycarbonate. The front opening is protected by optical barriers and safety relays with Class 4 rating.

Air brake

Pneumatic brake with "normally closed" air system to be applied on vertical movements to avoid emergency situations or absence of driving torque. It controls the air via 24V solenoid valve, which can be connected directly to the driver (of the ALPHA series) that moves the vertical axis:
- When the solenoid valve is ON, it provides air to the pneumatic brake, which releases the axis.
- When the solenoid valve is OFF, it cuts off the air from the pneumatic brake, which blocks the axis.

Mechanical protection barrier

Health & Safety module pursuant to EC standards. The structure is made of anodized aluminium profiles and polycarbonate. The front opening is the "up and down" type with safety microswitch. It is ideal for processes that involve the risk of projections of small particles and emissions of smoke or vapour.

Work surface

Aluminium work surface with reference pegs for robots of the WRa500 series. Suitable for securing work tools and equipment. Aluminium work surface with reference pegs for robots of the WRa300 series. Suitable for securing work tools and equipment.
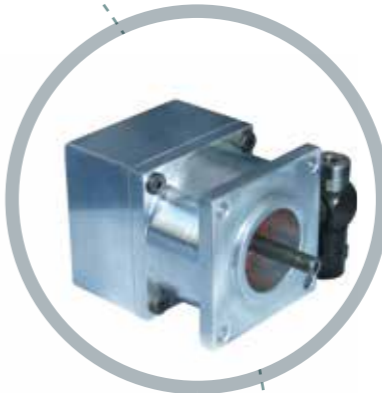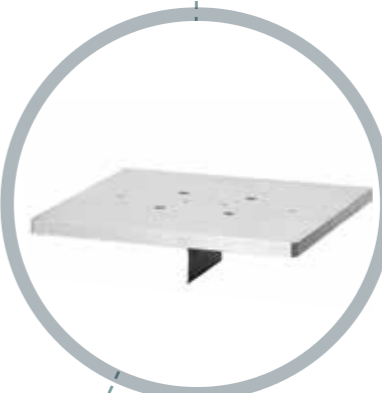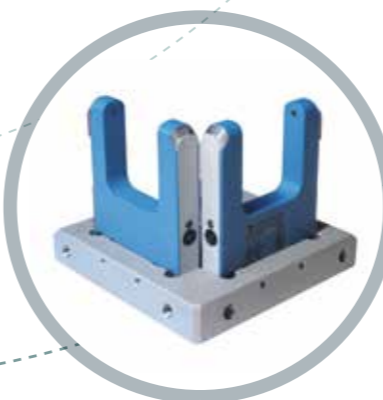
Analogue output

New analogue output card is giving out a 0-10V analogue voltage signal in order to perfectly drive dispensing application like volumetric pumps. This allow to have a perfectly constant amount of dispensing material even if robot speed is variable, and to have high quality dispensing at high speed, with very low cycle time.

Calibration system

Calibration system of X-Y with laser sensors for the ALPHA system. Connected to the inputs of the ALPHA system, it is able to automatically centre the program along axes X and Y in relation to the tool fitted. Using the ALPHA SW program, it is possible to set how to manage and use the calibration tool at your own pleasure. The system is devised for frequent and rapid tool changes.

alutec ROBOTICS

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Gantry Robot

3-4 axes system

Alutec Group offers customised machines tailored for the specific needs of customers, both in stand-alone version (also with automated loading and unloading systems) and configured to be installed on an automation line (even a pre-existing one).

Movements are performed by Cartesian axes systems with GANTRY structure and three and four interpolated axes (X-Y-Z-R). The machines are supplied complete with structure, wired electrical cabinet, safety guards and EC type-approvals. The work area can be customised from 500x500mm to 2000x2500mm, with the possibility to work on the specific work surface of the customer, on automation lines and on piece loading- unloading trolleys. The performances of the machines are modulated according to the specific application requirements of the customer; it is possible to handle up to 15 kg on the vertical axis, with high speeds, guaranteeing excellent precision and repeatability.The meticulous design ensures solutions that match the customers'

expectations. The custom machines of Alutec Group are controlled by the groundbreaking motion control system called ALPHA by Alutec Group, which, combined with the new proprietor software ALPHA, guarantees reference performances and new functions, for both stand-alone operation and for the communication of the robot with external systems (CANopen, serial RS232 or with 16 general purpose input/Output board, which are available even in the standard version).
The robot is programmed via the PC and subsequently controlled via the master line or the operator panel ALPHA, which can manage up to 255 programs and 100.000 processing points; It is able to control external systems (e.g. loaders-unloaders) and a number of

applications. The user-friendly graphic interface, the possibility to import files in .dxf, Gerber or Excel format and the new SUB-PROGRAMS function allow you to fulfil extremely complex operations, very quickly.
The custom machines of Alutec Group are the ideal solution for simple or complex dispensing, screwing, soldering or pick & place applications. Flexibility and design rapidity ensure the customer prompt responses. By supervising the whole design and mechanical, electronic and software realization, we are able to guarantee the quality and reliability of the solutions offered.

Applications
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X/Y/Z {R} Work Area (mm)	on request starting from 500 mm to 2000 mm
Worktable Load / Tool {R}	20-50 Kg 5 Kg (3 Kg) R
Max. Speed X,Y,Z	400 (mm/sec) MAX *
Repeatability	from ±0.015 mm/axis a 0,2mm/axis *
Resolution	0.004 mm/axis
Data Memory	100.000 Points / 255 programs
Drive System	stepper motors / Brushless motors *
Interpolation	point to point & continuous path
Programming Method	remote mode (self-learning) through PC software
I/O Signals	16 input / 16 output
External Interface	USB / RS232 /Analogue output optional
Power Supply	100-240 VAC, 50/60 Hz 500 Watts
Dimensions (WxDxH) mm	800x800 -3000x3000 *
Weight	500 -1000 Kg *

* This value can change, depending on the required robot configuration
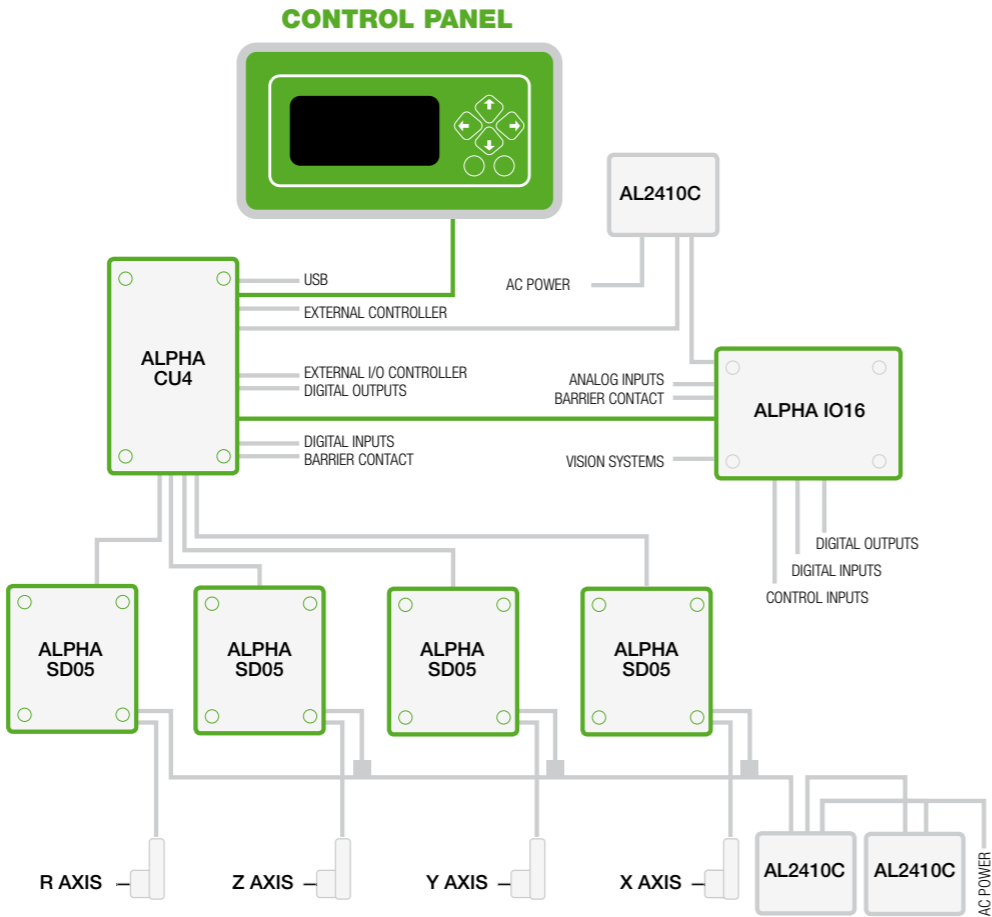
Alpha Series

Alpha series is a system that controls the movements of Cartesian axes, which enables the fulfilment of linear and circular interpolation in the work area of the robot.

Using programming software, you can easily load sequences of processes on the central unit memory, which is independent and can be subsequently controlled not only from the software and LCD panel, but also via serial commands, inputs and outputs and CANOpen® commands.

Alpha is equipped with a user-friendly programming graphic interface and excellent precision performances, speed and acceleration.

CONTROL PANEL

- AL2410C
- USB
- AC POWER
- EXTERNAL CONTROLLER
- ALPHA CU4
- EXTERNAL I/O CONTROLLER
- DIGITAL OUTPUTS
- ANALOG INPUTS
- BARRIER CONTACT
- ALPHA IO16
- DIGITAL INPUTS
- BARRIER CONTACT
- VISION SYSTEMS
- DIGITAL OUTPUTS
- DIGITAL INPUTS
- CONTROL INPUTS
- ALPHA SD05
- ALPHA SD05
- ALPHA SD05
- ALPHA SD05
- R AXIS
- Z AXIS
- Y AXIS
- X AXIS
- AL2410C
- AL2410C
- AC POWER

Control Software

The PC software interface, which can be connected to the USB port of the central unit, aids users in programming through the following actions:
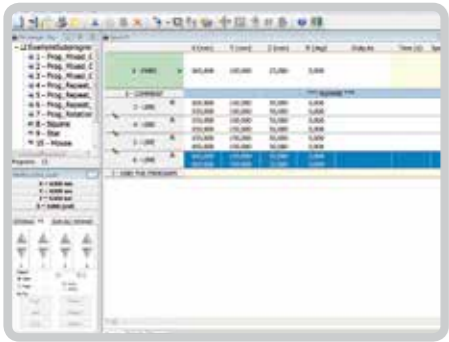
Configuring the system
Number and dimensions of the axes, configuration of the ramps and maximum speeds, type of sensors installed etc.

Programming the process
The movement steps of the robot (point, line, arch, circumference, area) generate 3D movement sequences, both "**point-to-point**" and "continuous path", which can detect inputs or activate outputs during their execution. Via the flow control steps (comment, branch, jump, calibration line, delay, input detection, output setting, **sub-program** execution), it is possible to implement cycles, sub-routines, portions of program perfectly similar to the programming language; the user is therefore able to fulfil various applications with maximum control of the system.
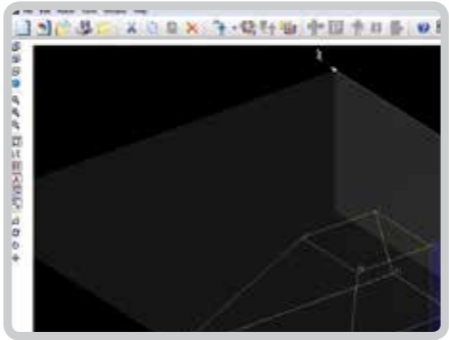
Setting the coordinates from files type
DXF(CAD), DXF(CAD), GDO(Gerber), XLS (Excel): this cuts right down on robot programming times, by exploiting the information that users already know from other systems. Functions such as copy/paste, drag and drop, multiple edit and the possibility to create sub-programs, help the user in rapidly controlling the final application and ensure maximum precision and repeatability in production contexts and de-structured environments and are always preserved thanks to specific parameters (anticipate output activation, calibration lines,...).
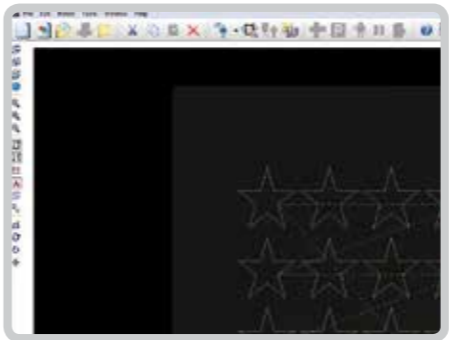
Diagnosing and testing the program in real time
Thanks to the 3D view of the paths and the "step by step" execution of each single step, it is possible to verify the positions and test the robot program to fine-tune and calibrate the final application.

Componenti Hardware

ALPHA CU4
The CU4 central unit is a control device for systems with three and four interpolated axes. It manages both linear interpolations and circular 3D interpolations with "point-to-point" and "continuous path" movements; it is programmed via proprietor software with user-friendly graphic interface. There is a support for connectivity type CANOpen® (standard CiA® DSP402) and serial RS232. All the work programs are saved on the internal flash memory and the standard process Library is included.

ALPHA IO16
The digital input/output board ALPHA IO16 is used to expand the input and output contacts. All the contacts are optoisolated and protected and can be used in PNP or NPN configuration and two outputs have relays. The board offers: 16 optoisolated "General purpose" inputs for connecting sensors, external push buttons, PLC outputs etc..11 digital optoisolated control inputs. 16 "General purpose" outputs for connecting tools, indicators etc.(digital optoisolated outputs / relay outputs). 7 status outputs. In addition, there is a serial connector for feasible future utilities. The board is used to manage the safety barrier.

DRIVER SD05
Drivers SD05 for bipolar stepper motors. SD05 manages up to 48Vdc and 5A with pulse chain input (max 100kHz) and direction. The operating parameters (microstepping, phase current, encoder etc.) can be set via proprietor software ALPHADriver SW.

ALPHA CP
Alpha Cp is the Control Panel for diagnosing and commanding ALPHA systems. It is used to display the status of the robot and to manage the following menus in **real time**: Select program / Robot controls menu / Inputs-Outputs Status / Diagnosis / Select language / Adjust display. The rear-lit LCD has 6 buttons to display and manage the menus (Standard on WRL300-WRa300-WRa500).

Technical Data

	WR**a**500	WR**a**300
Axes Motion System	3/4	3/4
X/Y/Z {R} Work Area (mm)	500 / 500 / 145	300 / 300 / 145
Worktable Load / Tool {R}	10 Kg X / 5 Kg Y , (3 Kg) R	10 Kg X / 5 Kg Y , (3 Kg) R
Max. Speed X,Y,Z	400 (mm/sec) MAX with protection	400 (mm/sec) MAX with protection
Repeatability	±0.015 mm/axis	±0.015 mm/axis
Resolution	0.004 mm/axis	0.004 mm/axis
Pitch Screw	8 mm	8 mm
Data Memory	100.000 Points / 255 programs	100.000 Points / 255 programs
Drive System	stepper motors	stepper motors
Interpolation	point to point & continuous path	point to point & continuous path
Programming Method	remote mode (self-learning) through PC software	remote mode (self-learning) through PC software
I/O Signals	16 input / 16 output	16 input / 16 output
External Interface	USB/RS232/Analogue output optional	USB / RS232 /Analogue output optional
Power Supply	100-240 VAC, 50/60 Hz 500 Watts	100-240 VAC, 50/60 Hz 500 Watts
Dimensions (WxDxH) mm	798x835x930	600x635x930
Weight	62 Kg	49 Kg

Technical Data

	WRL300
Axes Motion System	3
X/Y/Z {R} Work Area (mm)	300 / 300 / 140
Worktable Load / Tool {R}	5 Kg X, 1 Kg Y
Max. Speed X,Y,Z	1-250 mm/sec X, Y, 1-100mm/sec Z
Repeatability	±0,1 mm/axis
Resolution	0,08 mm/axis
Pitch Screw	-
Data Memory	100.000 Points / 255 programs
Drive System	stepper motors
Interpolation	point to point & continuous path
Programming Method	remote mode (self-learning) through PC software
I/O Signals	2 input digitali - 4 output digitali
External Interface	USB / RS232 /Analogue output optional
Power Supply	110/230Vac ±10% - 50/60Hz - 400VA
Dimensions (WxDxH) mm	440x645x800
Weight	32,7 Kg

	Gantry Robot
Axes Motion System	3/4
X/Y/Z {R} Work Area (mm)	on request starting from 500 mm to 2000 mm
Worktable Load / Tool {R}	20-50 Kg / 5 Kg (3 Kg) R
Max. Speed X,Y,Z	400 (mm/sec) MAX *
Repeatability	from ±0.015 mm/axis a 0,2mm/axis *
Resolution	0.004 mm/axis
Pitch Screw	-
Data Memory	100.000 Points / 255 programs
Drive System	stepper motors / Brushless motors *
Interpolation	point to point & continuous path
Programming Method	remote mode (self-learning) through PC software
I/O Signals	16 input / 16 output
External Interface	USB / RS232 /Uscita analogica opzionale
Power Supply	100-240 VAC, 50/60 Hz 500 Watts
Dimensions (WxDxH) mm	800x800 -3000x3000 *
Weight	500 -1000 Kg *

* This value can change, depending on the required robot configuration

Optional

X = already present in the basic configuration; O = optional; — = option not available

	WR**a**500	WR**a**300	WRL300
Wrist rotation on Z axes	O	O	—
ALPHA CP Control panel	X	X	X
X-Y-Z calibration system	O	O	—
Brake on Z axis	O	O	—
External cabled Electric panel	—	—	—
RS232 Control	X	X	X
Optical CE safety barrier	O	O	—
CE Safety barrier	O	O	—
Digital 16 input/16 output card	X	X	O
Software import. DXF, Gerber, Excel file	X	X	—
Subroutine Management	X	X	—
Work Surface	O	O	O
Analogue Output	O	O	O

Optional

X = already present in the basic configuration; O = optional; — = option not available

	Gantry Robot
Wrist rotation on Z axes	O
ALPHA CP Control panel	O
X-Y-Z calibration system	O
Brake on Z axis	O
External cabled Electric panel	O
RS232 Control	X
Optical CE safety barrier	O
CE Safety barrier	O
Digital 16 input/16 output card	X
Software import. DXF, Gerber, Excel file	X
Subroutine Management	X
Work Surface	O
Analogue Output	O

Applications

All possible applications	Dispensing	Pick and place	Milling	Screwing	Soldering

VTECH

alutec ROBOTICS

Via Mafalda di Savoia, 9 - 42124 Reggio Emilia - Italy
tel +39 0522 512580 - fax +39 0522 512542
commerciale@alutecsrl.it - robotics@alutecsrl.it
www.alutecsrl.it

VTECH smt ltd

Vision House,
Bandeath Ind. Estate,
Throsk, Stirling.
FK7 7NP. UK.

Tel: +44 (0) 1786 813999
Fax: +44 (0) 1786 813998
E-mail: sales@vtech-smt.co.uk
www.vtech-smt.co.uk