



CREATING AN "A-TEAM"

UNMANNED ROBOTS HELP MILITARY AND CIVILIAN TASK FORCES TO SCOUT THE TERRAIN AND ELIMINATE HOT SPOTS

- ▶ UNLEASHING NEW POSSIBILITIES IN HARSH ENVIRONMENTS, KONTRON'S COM EXPRESS® MINI MODULE PROVES TO HAVE A SMALL HEART WITH BIG POWER FOR MISSION-CRITICAL SITUATIONS

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THE SPECIALISTS IN THE SUCCESSFUL US TELEVISION SERIES "THE A-TEAM" WERE THE INSPIRATION WHEN YOSI WOLF AND ELAD LEVY FOUNDED THEIR COMPANY, ROBOTTEAM, IN ISRAEL IN 2010.



// ROCU-7 CONTROL UNIT

THEIR PLAN WAS TO DEVELOP A SPECIALIZED TASK FORCE OF UNMANNED ROBOTS IN ORDER TO SUPPORT SOLDIERS IN THE FIELD, AND ALSO TO SIMPLIFY THE WORK OF GOVERNMENTS AND CIVIL DEFENSE AUTHORITIES. BUT IN THIS CASE, IT IS AN A-TEAM MADE OF ELECTRONICS AND IRON. TODAY THE COMPANY HAS 35 EMPLOYEES AT ITS HEADQUARTERS IN TEL AVIV AND A 10-MEMBER TEAM IN MARYLAND IN THE USA.

As former members of a special unit in the Israeli army, the company founders were familiar with all the requirements that military operations demand when critical dangers have to be defused. Their objective was to develop modern unmanned systems that are easy to operate no matter how difficult the setting and that protect the lives of soldiers and members of the emergency services.

Today Roboteam develops and produces a variety of highly specific unmanned platforms and control units that can be used for defense, law enforcement or security missions. The Israeli company's robot solutions are used for tactical military missions as well as for handling explosives or chemical, biological, radioactive or other hazardous substances. However the unmanned devices are also used to investigate tunnels and underground environments, as well as for search and rescue.

Dozens of experienced engineers are steadily at work to develop unmanned systems that are as light as possible and rapidly available and that offer users a broad range of functions for different uses. Roboteam's customers include the US military and the Israeli army, as well as governments, special military units from various countries, and SWAT teams and elite units all over the world.



ROBOTEAM HAS DEVELOPED THE ROCU-7, AN INTELLIGENT CONTROLLER THAT EASILY DOES ITS JOB UNDER EVEN THE TOUGHEST CONDITIONS, FOR THESE MISSION SCENARIOS. THE COM EXPRESS® MINI MODULE FROM KONTRON IS A KEY ELEMENT IN THIS SOLUTION.

USERS WANT RUGGED QUALITY

Based on their own military experience and intensive talks with users, the company founders set clear priorities for the development of unmanned systems right from the start. The solutions that Roboteam offers should be compact and light-weight, as well as easy to operate. In addition, the application areas for unmanned robots also demand 3D representation, video communication and the necessary ruggedness for hard use in the field. Compliance with military standards is mandatory. From the very beginning, the development teams stressed the importance of an ergonomic product design and human-machine interfaces that conform to industrial standards. It should be possible to integrate the control units for the robots into any networks with different nodes. For its customers, Roboteam also stands for short production times, quick upgrades and good support. These quality standards that the manufacturer sets are also a challenge for its suppliers.

THE SEARCH FOR A SMALL HEART WITH LOTS OF POWER

Around three years ago, the developer team headed by Mark Vaynberg was looking for a small, flexible CPU that could easily be integrated into the new ROCU-7 control unit. After a short market analysis, they found what they were looking for at Kontron. „I had already worked with Kontron solutions at the university and had had only good experiences with the components,“ says Mark Vaynberg, who plays a major role in product development as the head of the Research and Development Department at Roboteam. Kontron developed the COM Express® mini module in order to implement power-saving computer-on-modules with greater x86 performance on a credit card-sized footprint (55 x 84 mm). „The ultra-compact module with COM Express® pin-out type 10 satisfied all the requirements with regard to functionality and performance that we expected from an ultra-small embedded solution for our ROCU-7 control unit,“ Vaynberg says. In addition, the price-performance ratio and global customer support at Kontron fit the bill. „Kontron is always a step ahead of its competitors when it comes to technology, and it always works with the latest Intel

processor technologies, which naturally benefits us as customers when it comes to speed and energy efficiency,“ the robot specialist says in praise of Kontron.

Kontron's COM Express makes a significant contribution to the ROCU-7's flexibility and broadly diversified deployment scenario, because it supports widespread commercial standards and also industrial standards. This makes it possible to use the controller in this especially critical setting. As a result, the systems keep working even when subjected to extreme temperature fluctuations and challenging environmental conditions such as extreme weather, severe dust formation or almost impassable terrain.



// ROCU-7 CONTROL UNIT

RUGGED HANDHELD FOR TOUGH JOBS

The name ROCU-7 stands for Ruggedized Operator Control Unit and classifies a handheld with a 7-inch monitor. Roboteam also offers a version with a 5-inch monitor. An operator can control various unmanned systems with just one of the rugged handhelds from the ROCU-7 series, no matter whether the device is a terrestrial robot, an unmanned aerial vehicle (drone) or a system for use in water.

The Windows-based handheld allows continuous control of all the units that are connected. This includes operation of the unmanned robot as well as control of its tactical mission. The rugged controller works with Windows 7 and has numerous standardized interfaces to various solutions. It is possible to control the entire mission management and carry out diverse independent actions.

CONTROL ALSO POSSIBLE WITH GLOVE AND JOYSTICK

For even more convenient usability, Roboteam equipped its rugged controller with a number of control elements. This includes joysticks, in addition to rugged switches that can also be operated with gloves. The unmanned units can consequently be precisely controlled and positioned at the site with pinpoint accuracy. The open interfaces make it possible to use the intuitive platform that Roboteam developed, along with complex external systems that users may be using. The COM Express modules from Kontron support this deployment scenario because they have been specially developed for use in multi-touch display systems and consequently perfectly fulfill the specifications for the embedded solution that Roboteam was seeking for its controller. Roboteam developed the ROCU-7 control unit on the basis of military standards in order to satisfy the requirements of ground troops around the world. This allows dangerous missions to be easily coordinated and carried out from a safe distance. The solution can also be used with unmanned air and water robots, however, in order to coordinate and control critical missions in real-time.

„We didn't use any of the commercially available standard rugged tablets for the ROCU-7. Instead we developed our own solution and used the best components on the market, such as the COM Express mini modules,“ Mark says to emphasize the Roboteam solution's unique selling point. „This allowed us to design smaller and more rugged units and equip them with exactly the control elements that we had in mind.“

CONVENIENT OPERATION BY DAY AND NIGHT

Individuality was also a key factor for the Roboteam developers when it came to the screen. The rugged controller's monitor can also be easily read in bright sunlight and it even individually adapts to difficult lighting conditions. Its light components also support use at night. The unmanned unit that is to be controlled can be clearly and precisely identified on the highly specialized screen in all light conditions. This allows a clear look at the unmanned robot at all times in all environments. So-called „starlight readable screens“ are an important tool, especially for use in tunnels or for underground surveys.

THE LIGHTEST POSSIBLE FIELD PACK

An important factor in Roboteam's selection of Kontron was the importance of light and compact designs for the Roboteam systems in order to simplify use in the field. The unmanned robot and ROCU-7 control unit together weigh a total of only around 16 kg. Task forces can carry the complete system on their backs across the terrain until they reach the point at which the robot has to enter the danger zone. This means that the soldiers do not have to go directly to the site of use in order to do their job. Instead, the munitions that are to be put in place are laid in the robot's gripper arm. The robot then drives by remote control to the site and deposits the munitions as required. Once the robot has left the danger zone, the munitions can be set off from a distance. Consequently neither the soldiers nor the robot are endangered. Conversely, this also makes it possible to retrieve critical materials from dangerous settings and securely decommission them in order to protect those involved.



THE COM EXPRESS® MINI MODULE FROM KONTRON HAS NOW BEEN WORKING IN ROBOTEAM CONTROLLERS FOR MORE THAN THREE YEARS AND HAS PROVEN ITSELF IN ALL ITS MISSIONS.

„Meanwhile we are using the latest generation of the module, but the older version also continues to work reliably,“ Mark Vaynberg explains. This is also required, because as a rule, the rugged unmanned robots have a service life of ten or more years assuming they are appropriately maintained. In the work with Kontron, Mark Vaynberg primarily appreciates the partner's technological know-how and exemplary support. „Both in Israel and in the USA, our most important locations, we can count on Kontron's very well-developed global sales network and very customer-oriented support at all times,“ he reports on his experience. „Kontron furthermore has a clear technological edge over the competition, which guarantees that our solution is always equipped with the latest technology and is consequently always state-of-the-art.“

About Kontron

Kontron is a global leader in embedded computing technology. With its employees in research and development, Kontron creates many of the standards that drive the world's embedded computing platforms. Kontron's product longevity, local engineering and support, and value-added services, help create a sustainable and viable embedded solution for OEMs and system integrators.

Kontron works closely with its customers on their embedded application-ready platforms and custom solutions, enabling them to focus on their core competencies. The result is an accelerated time-to-market, reduced total-cost-of-ownership and an improved overall application with leading edge, highly reliable embedded technology.

Kontron is a listed company. Its shares are traded in the Prime Standard segment of the Frankfurt Stock Exchange and on other exchanges under the symbol "KBC". For more information, please visit: www.kontron.com



CORPORATE OFFICES

EUROPE, MIDDLE EAST & AFRICA

Lise-Meitner-Str. 3-5
86156 Augsburg
Germany
Tel.: +49 821 4086-0
Fax: +49 821 4086-111
info@kontron.com

NORTH AMERICA

14118 Stowe Drive
Poway, CA 92064-7147
USA
Tel.: +1 888 294 4558
Fax: +1 858 677 0898
info@us.kontron.com

ASIA PACIFIC

1-2F, 10 Building, No. 8 Liangshuihe 2nd Street,
Economic & Technological Development
Zone,
Beijing, 100176, P.R. China
Tel.: +86 10 63751188
Fax: +86 10 83682438
info@kontron.cn