

PLC PRODUCTS

Future-proof automation for metro lines and tunnels

AC500 is ideal for complex infrastructure applications

Elmak is a global engineering company founded in 1994 and based in Istanbul, Turkey. With the Elmak Dubai Office, they now have around 50 employees. The company is specialized in automation and control systems, handling projects from the electromechanical design stage to the training plan. Over many years, Elmak has built up expertise to implement control systems for infrastructure & transportation, industrial automation and process control, while also providing system integration as well as proprietary energy management solutions and support services.



General Manager Ulvi Temel has worked as Elmak's company managing partner since 2010. He is an Electronics and Communication Engineer who is very experienced in automation technologies, both in the engineering and managing part. He is a pioneer who is creating state-of-the-art system architectures by closely following new technologies. In addition, he has wide experience in safety systems, and has a functional safety certificate.

—
Ulvi Temel, Managing
Partner at Elmak

Mr. Temel, what is it that has made Elmak so successful in rail and road infrastructure projects? Metro control projects are quite sophisticated applications. How did you get the know-how?

Metro projects require a multi-disciplinary approach, deep industrial control know-how and of course expertise in project management, Building Control Systems, Energy Management Systems, and Safety/Security Systems. Elmak has

managed these multidisciplinary projects for over 17 years. We put great effort into having strong application libraries, and we conducted many studies to create sector-based special applications, designed and created by us. As a result, we have a wealth of sector-specific experience at our disposal.

How did Elmak start the cooperation with ABB and what were the main reasons for it?

We are very familiar with ABB systems and products. We have some technical and commercial criteria for product selection, such as flexible architecture, easy product supply, competitive prices, and brand reputation. ABB has supported us in our projects by giving technical, commercial, and marketing support.



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Metro line in Istanbul,
Turkey, automated by
Elmak with AC500

Why did you start using AC500 in your infrastructure solutions? How do you see the position of AC500 in this segment as compared to competitors' products?

Compared to other applications, metro and tunnel projects are more complex because of the high degree of integration required: We have to add functional safety solutions and RTU features for wide-area communications to the necessary features. "Integration" means that different disciplines have to be handled in one controller (e.g. power and building automation) and also that different brands including many 3rd parties have to form one system.

Recently, safety systems also began to be requested by the clients.

In our opinion, the AC500 product family fits these requirements extremely well. It has versatile communication driver capabilities like IEC104 (for RTU), Modbus, IEC61850 (for power automation), KNX (for building automation), and Profibus. It offers redundancy for High Availability and comes with the full CODESYS platform power. A standard controller can easily be converted into a safe controller. The AC500 comes with big working memory and high CPU speed. As the amount of data per controller is very high, this is helping. And, last but not least, it comes with the possibility to use remote I/O structures with ring topology.

The combination of these features makes AC500 very strong in the infrastructure sector. Going forward, more IT-connected systems will be preferred. AC500 V3 is coming already prepared for IT integrations with OPC UA and MQTT. So we can confidently say that we will be able to continue using AC500 in the future.

How many projects have you implemented in Turkey with AC500 and what were the biggest challenges that Elmak had to overcome with ABB's PLC solution?

We started to use ABB products for the first time in the Eurasia Tunnel between the two sides of Istanbul, later on, in tens of road tunnels and at the end, in our metro projects. By now, we have deployed over 300 AC500 PLCs in 15 different projects. There are 3 sets of

AC500 PLCs and remote I/Os in a redundant set-up in each metro station. In a project with 20 stations, we integrated over 25 different sub-systems, and energy, industrial and building system protocols were integrated into the main architecture. We could provide all these functionalities with AC500.

Thank you, Mr. Temel for your industry insights!

In your opinion, what are current technology and business trends in the tunnel, highway and infrastructure world? What future challenges might we have to face?

IoT platforms have begun to play a bigger role to integrate automation systems with IT or data analytics platforms. Metro and tunnel operators have started to search a way to combine their lines' or tunnels' automation systems to create a "center of centers" for infrastructure control.

AC500 will need to position itself additionally as an Edge Device. So, more features on MQTT / IoT communications or data models and application/software management through the Cloud will be our next challenges. And if we were able to use it more like a PC platform, maybe we could integrate some IT applications also on the AC500.

Lastly, functional safety will be used more in future, we believe. It is already included in projects in some countries in Europe and the Middle East but we expect it to expand further.