

Visual Battlefield Data by Fotoniks

Humans receive most of the information about their surroundings through the human visual pathway (eyes), which is why a book that normally takes several weeks to read can be easily made into a three-hour film. We live in the age of information, where a broad range of devices, from a soldier's gunsight to the cameras of a satellite, provide an abundance of visual data in a multi-layered format. Working on supportive tactical electro-optic systems and on products that fuse the information provided by these systems, Fotoniks seeks to offer its users the best through innovative solutions.

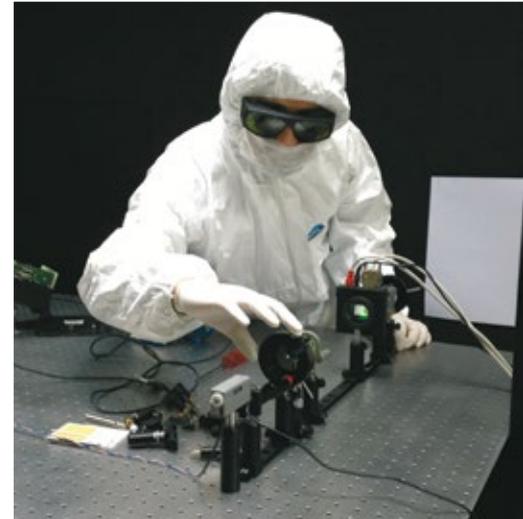
Fotoniks' primary area of activity is the design and production of tactical electro-optic systems that merge visual information, obtained under any conditions, with meta-data and then presents it to the user according to the mission definition at the relevant layer. Fotoniks' product portfolio includes thermal gunsights, night vision systems, laser designators and target detection, identification and orientation systems that can be fitted on soldiers' weapons or headgears used handheld on tripods, on armoured vehicles, and on out-post and base areas. Today, reconnaissance and surveillance systems equipped with Fotoniks-made thermal drive cameras are being used in different vehicles and regions. The company's new generation clip-on thermal gunsights, wide angle night vision systems, thermal binoculars and laser support systems are currently being used in the Turkish Armed Forces (TAF). The company is also continuing its activities on visual information and dynamic data fusion through the Smart Helmet R&D Project, and on aviation and avionics systems, which includes head-up display devices. The Head-Up Display System of the HÜRKUŞ aircraft, for example, is being manufactured by Fotoniks.

Following its establishment in 2010, Fotoniks has achieved significant growth in line with its business plan and technology road map. With its 41 strong team, the company's turnover for the past two years has averaged approximately ₺40 million. The company is currently working on a state-sponsored R&D project. In addition to this, it is also conducting two other projects using its own resources: a new generation camera that can be used on naval platforms, and a smart helmet R&D project. Fotoniks allocates approximately 25 percent of its turnover to R&D activities.

Cem Yazıcıoğlu, General Manager at Fotoniks, comments on the company's activities as follows: "Our goal is to make a difference in the products we offer. Our philosophy is to move



forward with new technologies that have proven themselves, equipped with full knowledge of the product's complete life cycle and our role within it, and by offering full support to the user. With imaging systems, we are focusing more on new generation detectors, image processors, image intensifiers and thermal image fusion. Furthermore, with regard to projection technologies, instead of the classic approach of reflecting an image through an optic sequence onto a projection surface, which requires a certain distance, we are working on optic wave guides that 'inject' the image into the surface. Based on this approach, we are conducting basic studies on surface computing systems, and possibly every type of transmitting surface in the future, as an interface for receiving and controlling information. An example in which these approaches I speak of have been incorporated in our solutions includes the following product: For soldiers, in addition to their basic mission systems such as thermal gunsights and night vision devices, there is the Multi-Purpose Thermal Binoculars that offer target detection, identification and coordinate-setting in a small but effective package. These binoculars, weighing



about 3.5 kg, can detect a person from 6 km, determine its coordinates, designate the person with a laser, take its picture, and then send it through a network connection. This system is a real force multiplier. This type of thermal imaging binocular – about which I cannot provide further technical information, since it is used by the Turkish Armed Forces – is manufactured by only four or five companies in the world. Our other solutions, which include Thermal Gunsights that can be mounted in front of normal, or day-time, gunsights without requiring any re-zeroing, and our Night Vision Gunsights, were first offered to Turkey by our company in 2011. These sights are very light – only about 400 grams – making these high resolution detector and optics much appreciated by their users.” Yazıcıoğlu also described their work on head-up display systems: “We are working together with a development partner company on the new generation head-up display system to be used on the HÜRKUŞ. The system relies on optic wave guide and new generation projection capabilities that will be used for the first time in head-up displays. Compared with older generation systems, our head-up display systems are 25 to 30 percent lighter, and have 30 to 40 percent less volume. Furthermore, the digital image source (or projection system), which is one of the basic technologies of the system, can directly replace the CRT tube projection systems used in legacy HUD Systems, which have high energy requirements. As a result, this extends the life cycle of head-up display systems. In this context, with the support of the Undersecretariat for Defence Industries (SSM), Fotoniks has almost completed the infrastructure-laying work for becoming an F-16 Head-Up Display Maintenance Centre, which will provide services at a regional level. We are planning to make the centre operational by September.”

Yazıcıoğlu noted that, looking ahead, there are still certain challenges in store for the industry: “While Turkey has gained highly advanced know-how on design and integration, there is still a lack of domestic options or resources for certain critical technologies. Despite the initiation of R&D work, there is still no serial production of semiconductor detectors and germanium lenses, which means that we have difficulties procuring them domestically.”

Yazıcıoğlu also shared his assessments of the situation with the Small and Medium-sized Enter-

prises (SMEs) in the industry: “In recent years, the support and means offered to SMEs in our country have increased considerably. Even so, there is a need to properly classify SMEs, on the basis of whether they are system and subsystem manufacturing SMEs, or those that manufacture parts and spare parts. Large defence industry companies, and particularly the [Turkish Armed Forces Foundation-affiliated] companies, tend to work with SMEs that do not offer products or services directly to end users – in other words, with SMEs that manufacture parts and spare parts that are not complete/finished products in themselves. These companies see SMEs that use advanced technology and work in niche areas and which are capable of producing the same or a similar range of systems and sub-systems, as their competitors. Owing to their somewhat privileged position, they sometimes engage in excessive undercutting in open tenders, by utilizing their high margins on sole source projects which they are awarded directly. Unfortunately, they use this approach as a hidden subsidy, particularly for taking the SMEs they see as competitors out of the game. We believe that asking prime contractors to provide a ‘Sub-Contractor Plan’ in every project of certain size, and protecting SMEs against larger companies, will serve as an important milestone for promoting the development of SMEs, while also enabling the formation and maturation of design and technology development capabilities in Turkey on a wider and sounder basis. This approach will help resolve the problem I mentioned. Thanks to this plan requested from prime contractors, larger companies will be able to reinforce their position as main integrators and system suppliers, while technology-based SMEs will become powerhouses that support the prime contractors, and will also manage to find their own living space forming a healthy symbiotic circle/eco-system. This will enable them to develop and mature in their own areas of interest, and to open up to foreign markets together with prime contractors. We mustn’t forget that generating economic added value requires indigenising the inputs that are [procured from abroad with foreign currency] by as much as possible, while also enhancing foreign currency revenues through exports. Achieving this will necessitate a joint industry development and cooperation model, based on a realistic situation assessment and realistic objectives.”

