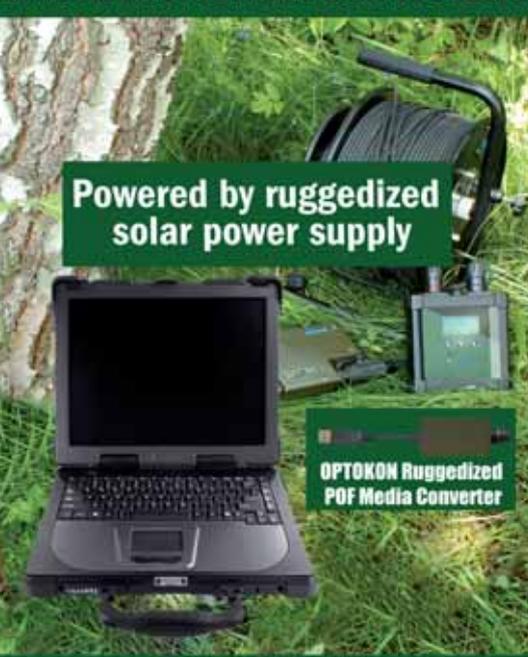




## OPTOKON HMA SERIES HARSH ENVIRONMENT CONNECTORS



Powered by ruggedized solar power supply

OPTOKON Ruggedized POF Media Converter

OPTOKON NATO  
SUPPLIER CODE: 1583G

## HARSH ENVIRONMENTAL EXPANDED BEAM CONNECTOR

HMA-J series  
HMA-S series



- Advanced expanded beam technology
- MIL-DTL-83526 specification
- 2 - 8 fiber channels
- Singlemode and/or Multimode
- Hermaphroditic interconnection
- No adaptors necessary
- Combined fiber and electrical channels

## HARSH ENVIRONMENTAL FERRULE CONNECTOR



HMA-JF Series

- SFF ferrule termination procedure
- Excellent transmission parameters
- Hermaphroditic interconnection
- 2 - 4 fiber channels
- Singlemode and/or Multimode
- No adaptors necessary

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# IDEX 2013

## Demonstration, Training and Test Center (DTTC)

*The Defence and Security Industry Association of the Czech Republic (DSIA) has established the Demonstration, Training and Test Center (DTTC) in the framework of its support for the domestic defence and security industry*

The DTTC will be located in the premises of OPTOKON, a.s. Jihlava where its primary mission is to promote the presentation activities of all members of the Association and to create an environment for the introduction of new technologies and systems departments for the Czech Republic. It will also be a place where there will be joint workshops and seminars to prepare the consortium associated in DSIA to jointly offer integrated solutions to the Ministry of Defence as well as outside the Czech Republic. The DSIA expects that the use of DTTC will gradually expand with experience and the requirements and needs of DSIA members.

The DSIA has established the center in order to find new methods and ways of promoting the domestic defence and security industry with the intention of playing an even greater role as an initiator of industry cooperation when setting up joint integrated solutions for the Ministry of Defence, or for the implementation of applied research, experimental development and innovation.

The DTTC will offer DSIA members space for presentations and demonstrations of new products. Army representatives, including foreign delegations will also be invited. THE DTTC is open to DSIA customers and as a training center for military specialists. This will mostly concern security products and systems for command and control of the Army of the Czech Republic, in other words, to support the implementation of C4ISR. DSIA assumes that the mutual use of the DTTC by members of the Association and the Army of the Czech Republic will create a synergistic effect and strengthen confidence in the domestic industry, which will optimally meet customer demands.

*On this occasion, we asked the President and CEO of DSIA, RNDr. Jiří Hynek.*



**Mr President, what is the main mission of the DTTC?**

Our main mission is always to support domestic industry in the implementation of contracts for the defence and security industry both at

home and abroad. This, of course we do, although the current economic situation forces us to seek ever more efficient and sophisticated ways of support. We see that both domestic and foreign customers require more and more integrated solutions that one company alone cannot offer. We think that the DTTC will create the conditions for a mutual organization leading companies to submit joint bids for the implementation of integrated system solutions for foreign acquisition. To help our companies in the export market is also an important factor in the new forms of support from the DSIA.

**How do you intend to put this initiative into practice?**

Representatives of the defence and security industry are pragmatists with a rapid response to customer re-

quirements. This leads us to the fact that we prefer the DTTC practical introduction into practice. The first few events that we implement, will help shape DTTC procedure and then we will draw up some clear and simple rules that do not restrict us but create a common framework for the use of the center. On the other hand, it is necessary that our initiative is to introduce responsible personnel to the Defence Department and other departments, which we will do in the short term in the form of official communication, or maybe even on the pages of this magazine.

**Mr. President, why did you choose Jihlava as the DTTC site?**

Our decision was influenced by two factors. The first is the location of OPTOKON, a.s. in Jihlava, in the centre of the Republic. We want all DSIA members to be treated equally. The second factor was the very positive attitude and full support of the General Director of OPTOKON, as Jiří Štefl, who offered us facilities, both existing new, that they are willing to adapt to this purpose and are technically equipped.

We even had the opportunity last year to use the existing facilities for AOBP off-site training sessions and we were delighted with the facilities and the friendly attitude of all the OPTOKON staff. So why not continue with it?

**The title says DTTC training and testing. What are your ideas in this context?**

We want to offer our military something that is already long established throughout the world. It is a fact that professional army soldiers should only undertake those activities related to combat operations and the use of weapons. All other supporting and service activities, such as training and testing of new technologies, can be provided by private enterprise, for example, members of the DSIA. Such an approach is beneficial for both parties. The army should be professionally armed soldiers with only the required number of bound structures of military units and equipment. Security through external companies would be at a significantly higher professional level, as in the agreed selection procedure, which is not possible within the army.

This new approach will not be easy to introduce into the army, but we are striving for it through the DSIA creating favourable conditions and showing that the defence and security industry with the support of the Czech Army, takes it very seriously.

**Mr. President and Executive Director of the DSIA, thank you for the interview and for outlining new approaches to supporting the national defence and security industry.**

*We also asked a couple of questions to Jiří Štefl, the General Director of OPTOKON, a.s. who will organizationally and administratively house the DTTC.*



**Mr. General Director, can you explain the reasons for your support for the new DTTC concept?**

I understand the concept as an innovative approach to

promote domestic industry and to improve the offers that the organization can make to both domestic and foreign customers. The original idea of introducing new approaches and supporting the industry together to finalize the implementation of the DTTC does not mean in practice that the desired effect is reached, therefore giving up the search for new approaches. You know, our company operates at home and around the world and in our daily work, we can see how states support the domestic industry, and create various restrictions and conditions so that taxpayers contributions are largely channelled into the volume required for local legislation at home. Therefore, I support the idea of finding new ways to support domestic industry and I intend to continue to implement it in order to create suitable conditions.

### How will the DTTC affect the internal operation of OPTOKON, a.s.?

OPTOKON, a.s. is a company with a number of foreign affiliates which organize various events of both small and large significance. Our employees understand this and the DTTC facility do not interfere with the administrative, research and development, or production environments. OPTOKON, a.s. is a company with an innovative approach

that addresses the applied research, experimental development and innovation projects, technological specialization in optics and optoelectronics, and manufacturing projects for customers from Japan to the U.S., so the implementation of DTTC is a challenge for us to use all our expertise and organizational abilities.

### Mr. General Director, can you explain how the DTTC is financed?

The center is organized under the auspices of DSIA, which is a non-profit organization, so we do not assume that the DTTC will be a profitable "business". Together with all domestic defence and security industry companies and customers who will benefit from this facility, we will seek ways to cover operating costs. I think that for our customers in the Ministry of Defence a good sign is to create greater trust on both sides.

**Mr. General Director, we thank you for answering our questions and hope that on the occasion of your first events you will invite us to the DTTC, so we can monitor the progress of these new initiatives and that our journalistic work can contribute to your innovations.**

Interview by Ing. Milos Soukup

## Technologies supported efficient use of C2/C4ISR systems

Military communication systems have been used by military organizations for both strategic and tactical communications for many years, beginning in ancient times with running messengers or horse riders, carrier/homing pigeons, later by smoke and light signals up to communication and signalization systems via copper wire cables. In the last two centuries, new developments in the field of spreading and transmitting electromagnetic signals enable the setup of modern communication systems in military conditions. Two progressive technologies in particular are largely used in many applications:

**FIBER OPTIC SOLUTIONS  
RADIO SYSTEMS**

The use of both systems allows the application of a complete communications system in a wide range of military infrastructure, beginning with the connection from each soldier on the battlefield up to connection and signals transmission at the highest army headquarter levels: battalion, brigade, ...

The huge transmission capacity of optical fiber, operating at the highest transmission speed over long haul distances can ensure C2/C4ISR:

**COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS, INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE** services in military networks.

### FIBER OPTIC SOLUTIONS

OPTOKON, as a leading global designer and manu-



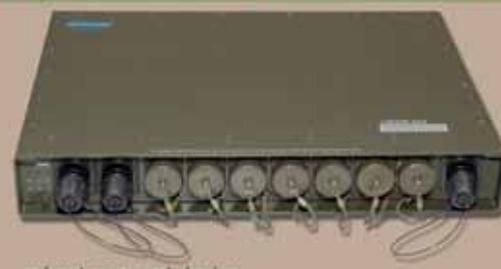
## OPTOKON ACTIVE DEVICES OPTOKON NATO SUPPLIER CODE: 1583G LMSW-10 SERIES RUGGEDIZED FIELD SWITCH



**CZECH ARMY TECHNICAL SPECIFICATIONS:  
TP-LMSW10-0PT01-08**

- robust compact design
- 2 fiber optic ports, 8 UTP ports, 2 FXS ports
- 10Base-T/100Base-TX a 100Base-FX standard
- PoE – Power over Ethernet
- IEEE 802.3/802.3u auto-negotiation function
- QoS function for each port
- VLAN support for each port
- support of STP (Spanning Tree Protocol)
- LED signalization
- backup battery - 4 hours operation
- complies with STANAG 4643 standards
- hard carrying case for transportation

## LMSW-08 SERIES RUGGEDIZED FIELD SWITCH



- robust compact design
- 2 fiber optic ports, 6 UTP ports, 2 FXS ports
- 10Base-T/100Base-TX and 100Base-FX standard
- IEEE 802.3/802.3u auto-negotiation function
- LED signalization
- external battery backup
- complies with STANAG 4643 standards

## LMC SERIES COMPACT MEDIA CONVERTERS

- interconnection in harsh environment conditions
- 10/100/1000 Mbps data transmission
- FO connectivity up to 2 km for MM, 80 km for SM
- OPTOKON HMA fiber optic connector
- Full-Duplex, Half-Duplex or Auto selectable.
- MIL-STD tested



**Czech Army  
Technical specifications:  
TP-0PT-1981-2004**

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facturer of fiber optic network solutions, specializes in the production of military tactical components for use in harsh environmental conditions.

OPTOKON, an ISO 9000 and UL approved company, develops, manufactures and markets fiber optic products at the leading edge of technology and employs over 160 staff across its headquarters and branches in Poland, Slovenia, Romania, Ukraine, Latvia, Estonia, Lithuania, Saudi Arabia and representative offices in USA and Germany.

OPTOKON currently supplies the military forces of more than twelve countries with high quality military tactical components using unique Expanded Beam technology.

Similar to the standard telecommunication and data network, the fiber optic network has almost replaced copper wires communication cables over long distances.

Interconnection networks equipped with OPTOKON passive fiber optic components are designed to connect the nodes of tactical networks using cables with optical fibers. The expanded beam technology used preserves all the advantages of signals transmission through the optical lines in field harsh environmental conditions.

Tactical cables with expanded beam OPTOKON connectors enable connection between headquarters and subaltern points in field conditions in a very short time, for example. The flexible 2 – 6 fiber 6 mm outer diameter optical cables have high crush and strain relief resistance and a rugged field repairable connector design. The wide range of cable drums has been developed to facilitate storage and manipulation with cable coils. The drums are designed to store up to 500 m tactical cable. The low weight of the cable coils allows easy network reconfiguration in field conditions.

There are two systems of fiber optics cable termination using OPTOKON connectors – high performance manufactured optical cables with installed OPTOKON connectors including comprehensive tests and visual inspection in factory conditions. The second option - rugged field repairable connector design allows to terminate the tactical cable with optical fibers in harsh environmental conditions.

Comprehensive repair and maintenance kits are available in support of OPTOKON expanded beam connectors. The termination and repair tool kit contains all necessary tools, accessories and consumables to install or repair the OPTOKON connectors. The next tool set - Splice repair kit allows for the complete repair of broken fiber optic cable within 30 minutes in field conditions. The fusion splice kit is designed to repair broken optical cable by using a portable fusion splicer. The maintenance cleaning kit and Diagnostics set keep all optical transmission network components in an operable status and check their parameters.



In addition to passive fiber optic components – ac-

tive devices have been developed to ensure data transmission between communication network nodes. The active devices includes media converters from the LMC series and the LMSW-10 and LMSW-08 switch series, which conform layer 1 and layer 2 of the Open Systems Interconnection (OSI) model (ISO/IEC 7498-1). This is a product of the Open Systems Interconnection effort at the International Organization for Standardization. It is a prescription of characterizing and standardizing the functions of a communications system in terms of abstraction layers. Similar communication functions are grouped into logical layers. A layer serves the layer above it and is served by the layer below it.



Now, OPTOKON has developed the new LMSB14 ruggedized switch as part of the Integrated System for the Armed Forces of NATO. OPTOKON is proud to describe the LMSB14 as the next step in OPTOKON ruggedized field equipment – a ruggedized switchboard capable of 206 simultaneous connections utilizing modern technology in telecommunication fields. The LMSB14 is additionally equipped with 2 optical ports with OPTOKON HMAJ connectors in order to ensure communication in harsh environments over long distances. The rugged metal box housing the switchboard is waterproof, lightweight and easy to transport. The switchboard contains two RF stations to enable radio dialing via a handset. The LMSB14 supports major telephony techniques as well as analog fax and data equipment. The interconnection networks, based on fiber optic components, are designed to connect the nodes of tactical networks using fiber optical cables. The unique Expanded Beam technology used preserves all the key advantages of signal transmissions through optical lines in harsh environmental field conditions.

## RADIO SYSTEMS

OPTOKON offers its customers the complete HW solution for tactical military networks using components that have successfully passed military testing and supplier approval for both NATO and non NATO nations.

The wide range of passive and active fiber optic components has been developed for installation of temporary tactical military networks in heavy terrains. The fiber optic technology based network is designed for transmission of high-speed data signals over almost unlimited distances.

However, the actual optical fiber is designed for installation of the tactical network core - backbone setup connection between fixed nodes in the telecommunication network.

On the margins of the tactical network, in addition to fixed network nodes, a connection between mobile and stationary units with troops moving in the terrain is essential. For this reason, a connection system based on ruggedized fiber optical components has been completed using mobile radio systems:

The radio systems are designed for communication between mobile groups, for issuing orders from headquarters to individual soldiers and for communication between soldiers during missions. The radio system must be compatible with the communication system used in the core optical network; it must ensure security during communication in all segments of a common network. The radio system shares all data, communications and control servers, both HW and SW to setup the unified network.

### These are comprised of three radio systems:

- personal short-range radio system
- handheld and mobile transceiver
- portable and mobile sets for voice and data communication

The personal radio system is a short-range transceiver operating in 2.4 GHz band with a spread spectrum that provides voice and data communication. It is primarily designed for operation groups of up to 30 persons requiring mutual communication (each to each) with a rebroadcasting option, although it also supports networks with an unlimited number of participants. The transceiver is suitable both for communication among buildings and in open terrains, where the range extends up to 1000 m. The personal role radio is available in both – a handy portable and vehicle versions.

The handheld and mobile transceivers provide reliable (TRANSEC) and safe (COMSEC) communication under highly demanding conditions. The transceivers operate in several frequency bands (multiband), serve several purposes (multirole) and work in several operation modes (multimode). The handheld EPM transceiver is designed for communication on a tactical level in all military branches.

The system based on the portable transceiver offers fixed frequency radio voice or data communication in the VHF band. The portable transceiver is designed for radio voice or data communication on tactical level in all military branches and features voice communication via a built-in encryption unit, sending short encrypted messages; it is particularly suitable for vehicle installations or fixed posts.

Both technologies, fiber optic for stationary command posts and radio systems for mobile units, are basic technologies for communication reasons of Command and Control systems in each level of command. Current military requirements for more and more real time data needs robust data channels. Fiber optic technology offers an almost unlimited data flow for stationary command posts. Another issue is no electromagnetic emission of optical fiber, which is a major advantage in terms of security. Radio communication for mobile troops will never offer the same data flow as fiber optics, even though mobility is another major requirement of military units. Working together, both technologies perfect fit for the integration of different C2 systems using computers and communication systems for supporting Command and Control as showed in the large picture in this article.

**OPTOKON**