

OPTOKON ruggedized tactical optical network

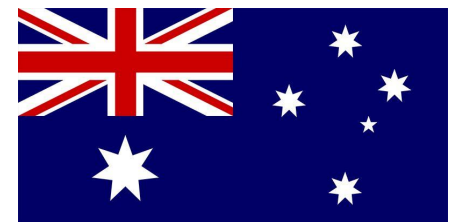
SUPPLIER OF
NATO ARMED FORCES
FOR MORE THAN 20 YEARS



NATO supplier code: 1583G



POWERTECH
ENERGY



OPTOKON GROUP

HEADQUARTERS PRODUCTION & RESEARCH CENTER CZECH REPUBLIC



OPTOKON, a.s.

Červený Kříž 250, Jihlava

OPTOKON Prague Office

Venušina 1149/3, Prague 10



OptoNet Communication

- Complete solution for ISP
- Management of optical network
- Datacenter and telehouse services



OPTOKON Kable

- Optical cables manufacturing



“one team one dream”
“one united company”

EUROPEAN MANUFACTURER AND SUPPLIER
WWW.OPTOKON.COM



OPTOKON Baltic



OPTOKON Egypt



OPTOKON PLT, Malaysia



OPTOKON Poland



**OPTOKON Middle East for Industries,
Kingdom of Saudi Arabia**



OPTOKON Serbia



OPTOKON Slovenia



OPTOKON Elektronik, Turkey



OPTOKON Ukraine



OPTOKON USA

Data Network Equipment

- Media Converters

10/100/1G/10G/40G/100G

- SFP, SFP+, XFP Transceivers
- EDFA Amplifiers
- OPTTA - Powerful servers for AI



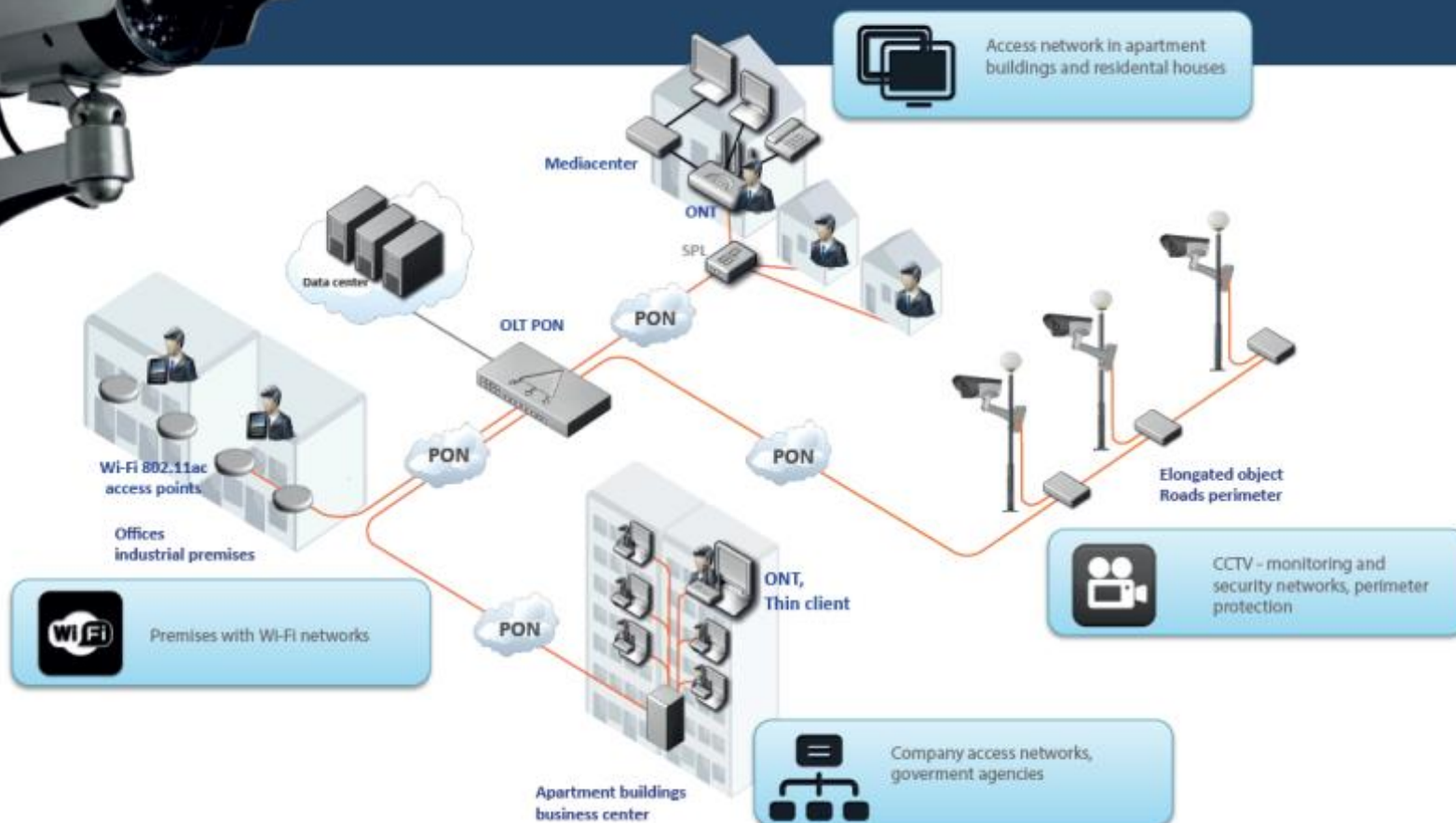
- **FOTAS** - Perimeter Security system

OPTTA family

- Ruggedized Military AI server OPTTA-PP62X
- Commercial / Industrial AI server AICP-X128



OPTOKON SECURITY NETWORK



OPTOKON ruggedized network

- HMA series harsh environment connectors and patchcords
- Cable drums for tactical optical cables
- Ruggedized field fiber optic converters and repeaters
- Ruggedized field switches, routers
- Ruggedized phones
- Ruggedized fiber optic test equipment
- Ruggedized communication systems
- Maintenance and installation tools



NEW GENERATION OF LMCP FAMILY

LMCP-28H-NGe

Light Mobile Computing Platform – Extended version

- Intel® Xeon® processor
- **Up to 256 GB RAM ECC DDR4**
- 2x removable SSD 2.5 inch, RAID 0,1
- **Wide operating temperature range: -40 to +85 °C**
- **Uplink 10/25 Gbps**

LMCP-28H-NGa

Light Mobile Computing Platform

- Intel® Xeon® processor
- Up to 64 GB RAM ECC DDR4
- 2x removable SSD 2.5 inch, RAID 0,1
- **Wide operating temperature range: -40 to +85 °C**
- **Uplink 1/10 Gbps**

LMCP-7H

Light Mobile Computing Platform

- Intel® Xeon® Processor
- Up to 64 GB DDR4
- Wide operating temperature range: -32 to +75 °C

TEMPERATURE RANGE: -40 TO +85 °C
UPLINK 10/25 GBPS

OPTOKON ruggedized network



LMCP-7H
Compact, ultra-durable server

- Intel® Xeon®/ Core™ Processor
- Up to 64 GB DDR4
- 3x 1G routed server ports
- 7x 1G switch ports

OPTTA-PP62X
Land Mobile Graphics Processing Computing Platform

- 2x Intel® Xeon® Silver 4316 @ 2.30 GHz
- Up to 4 TB DDR4 RAM
- Up to 8 removable SSD
- 2x 1G Ethernet routed ports
- nVidia graphics card RTX™ A4000

Connectors and cables
for extreme temperatures
ranging from
-60°C to +85°C

CISCO Technology Integrator



LMSW-E33

Ruggedized 1/10 Gi gabit switch

- **Ethernet Layer 2/3 Managed PoE Switch**
- 2x 1/10G WAN, FO HMA or RJ-45
- 8 or 24x LAN 10/100/1000Base-T, PoE y

**OPTOKON'S R&D
SOLUTION TECHNOLOGY INTEGRATOR
OF CISCO SYSTEMS**



Metallic cables for harsh environment and military

- **Rugged and durable** specialized cables with **multipin connectors**
- Output ports for various types of signals such as **Ethernet, video, USB, and serial signals**
- Designed for **industrial and military environments**
- **Flexible EMI shielding** to protect against electromagnetic interference, information leakage



COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS, INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE



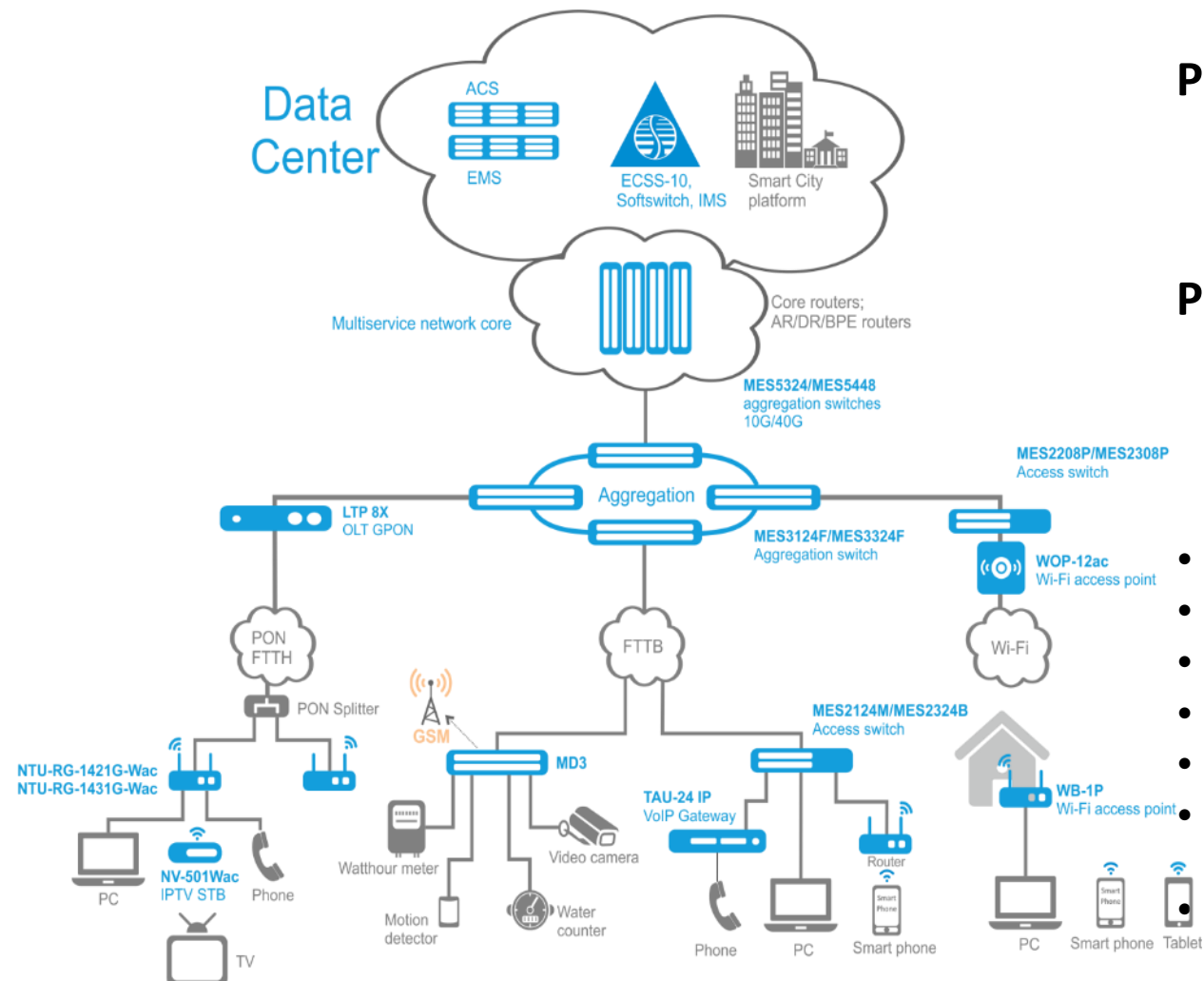
Passive Optical Network (PON)

PON – GPON

– OLT:

– ONU:

PON - ONU NTU series



- **HAG – Home Access Gateway**
- **IPTV (Set Top Box)**
- **Switches**
- **Access, Aggregation, Data Center**
- **Thin clients**
- **EMS: Centralized Managing Network System**
- **SFP for PON**

Testing Division

Mechanical testing, temperature and semi-anechoic chamber

The OPTOKON testing division offer Individual temperature and mechanical test methods according to the standard CSN EN ISO/IEC 17025.



Calibration services:

- Calibrating thermometers from -40°C do $+140^{\circ}\text{C}$.



OPTOKON Temperature chamber



OPTOKON Pressure resistance test workplace



OPTOKON Testing Division

Testing services:

- Accredited fiber optic calibration laboratory 317/2011
- EMC test (MIL-STD 461G and EN 50147-1)
- Tensile test fiber optic cables
- Cable abrasion test
- Pressure resistance test
- Shock resistance test
- Repeat bending test
- Torsion Test
- Test of cable flexibility
- Bending test in loop
- Dynamic bending test
- Temperature cycling
- Water penetration test



OPTOKON EMC chamber

The OPTOKON EMC chamber meets all the MIL-STD 461G requirements for the certified EMC measurement of the tests: CE 101; CE 102; CS 101; CS 114; CS 115; CS 116; RE 102 and RS 103. The design of the chamber meets the field intensity minimum 50 V/m for the susceptibility tests. The shielding effectiveness measured according to the EN 50147-1 is stronger than the EN 50147-1 recommendation.

Calibration Laboratory

- Independent
- Calibration of Fiber Optic Test Equipment from all manufacturers
- Professional personnel certified by third party
- Traceability of etalons
- Interlaboratory Comparisons
- Accredited Calibration of OTDR's



ACCREDITATION NUMBER 317/2011
according to EN ISO/IEC 17025:2005

Calibration Center for Europe and the Asia-Pacific Market



MEMBER OF OPTOKON GROUP

In the heart of Europe

■ Backbone ("PAN European" a "Viking Network")

■ Data Center Vysočina Optical Network

DATOVÉ CENTRUM VYSOČINA
MODERN INFRASTRUCTURE
VYSOČINA, CZECH REPUBLIC



OPTOKON Service and Installation

- **Service** of Fiber Optic Test Equipment & Devices
- **Installation** of Fiber Optics Lines

OPTOKON KABLE DESIGN & PRODUCTION CENTER

- European fiber optic cable manufacturer
- Very latest modern technology



WWW.OPTOKONKABLE.COM



MEMBER OF OPTOKON GROUP



Optical and hybrid cables

for mobile and tactical use based on military
norm MIL-C-85045



**CONNECTING THE COUNTRIES OF THE WORLD
WITH HIGH-END FIBER OPTIC CABLES**

WWW.OPTOKONKABLE.COM

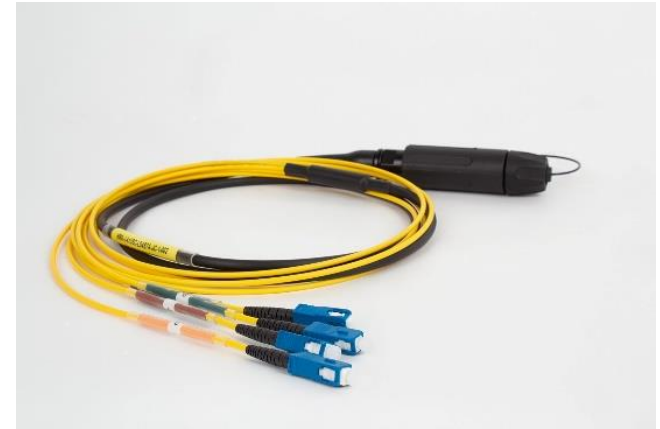
WWW.OPTOKON.COM

OPTOKON Elektronik Limited Şirketi

Member of OPTOKON GROUP



- Rugged computing devices
- Rugged notebooks, tablets, box PCs, handheld devices, and defend panel PCs
- Manufacturer of passive components
- Designed to harsh environmental conditions, industries and military

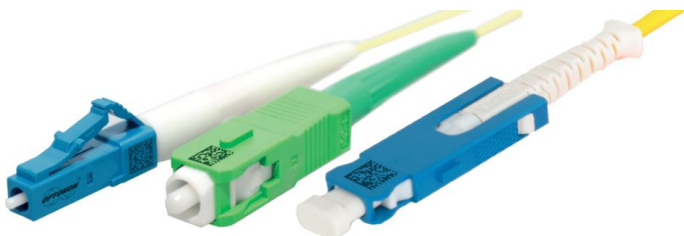


OPTOKON Middle East (KSA)

Member of OPTOKON GROUP



- The company is based in Riyadh, Kingdom of Saudi Arabia
- Manufacturer of passive components
- Fiber optic solutions and services in the Middle East region
- Ruggedized products
- Installation, maintenance, and training for OPTOKON test equipment



OPTOKON Middle East Supervisor marking laser

OPTOKON Pacific (Malaysia)

Member of OPTOKON GROUP



- Camera systems
- Video door entry systems
- Access systems
- NVR Recorders
- Security systems
- Active network devices

Malaysian calibration Laboratory

- Accredited Calibration Center for the **Asia-Pacific Market**
- Cooperation with Malaysia's government Calibration Laboratory **SIRIM SST**.

DATOVÉ CENTRUM VYSOČINA



OPTTA family

- Ruggedized AI server OPTTA-PP62X
- AICP-X128 Industrial AI server



Meets Tier 4 – 99.995%
Guaranteed availability

The first data center in the Czech Republic to detect security violations using optical cable and FOTAS equipment.

- **Zero single points of failure.** Tier IV providers have redundancies for every process and data protection stream.
- **99.995 % uptime per annum.**
- **2N+1 infrastructure (two times the amount for operation plus a backup).** 2N+1 is “fully redundant.”
- **26.3 minutes of downtime per annum** as a maximum
- **96-hour power outage protection**

NEW OPTOKON DATA CENTER SYSTEM

- HIGHS DENSITY CABLING SYSTEM
- MONITORING OF ENVIRONMENT

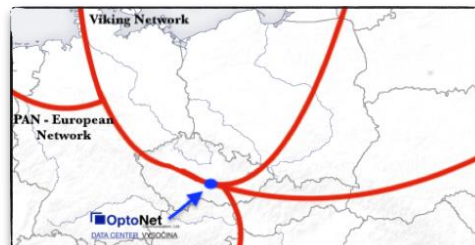
DATA CENTER
DOS
OPTOKON SYSTEM



Meets Tier 4 Certification

- Cloud, Hybrid cloud, Private cloud
- Redundant storage
- SaaS, PaaS, IaaS
- IT as service
- Server housing, hosting
- Services for ISP
- Services for corporates customers
- IPTV, streaming

The Main European fiber-optic networks

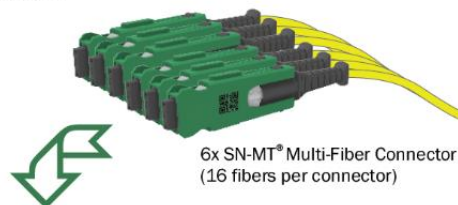


DOS Data Center Cabling System

TECHNOLOGY FOR FUTURE DATA CENTRE STRUCTURED CABLING SYSTEM with **SN-MT Next Generation Multi-Fiber Connector**

Next Generation Multi-Fiber Connector
SN-MT® 16 CONNECTOR up to 16F in one row

The cables with 96 - 384 fibers terminated with multiber connectors are installed into PUDOS pull-out unit equipped with CNPM panels with SN-MT adapters.

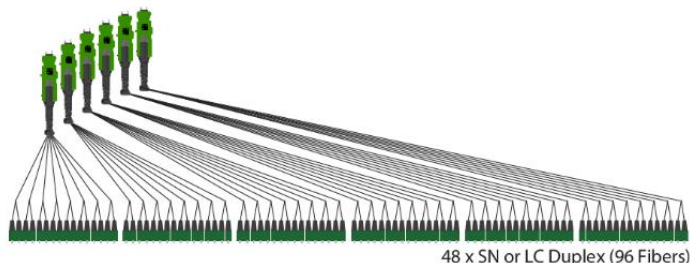


Optical cable
96F to 384F

Example of PUDOS (1U Distribution Frame) with one CNPM panel equipped with 2 x SN-MT® Adapter and 6 connectors (96F)



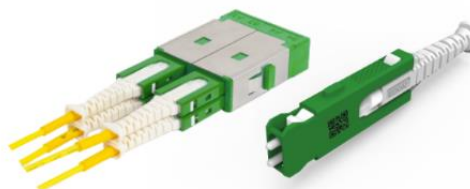
1x CNPM panel = up to 6x SN-MT® Adapter for 4 connectors = 384 F
2x CNPM panels = up to 12x SN-MT® Adapter for 4 connectors = 768 F
3x CNPM panels = up to 18x SN-MT® Adapter for 4 connectors = 1 152 F



48 x SN or LC Duplex (96 Fibers)

**MAX CAPACITY
1 152 FIBERS**
with 3 fully-equipped CNPM panels
in 1 unit

High density with duplex SN®
Connector and adaptor



PUDOS-1E-384-SNMT4
Termination for 384 Fibers



PUDOS-1E-768-SNMT4
Termination for 768 Fibers



PUDOS-1E-1152-SNMT4
Termination for 1 152 Fibers

DATA CENTER
DOS®
CABLE SYSTEM

DOS[®] SOLUTION MAXIMUM DENSITIES

Each component is specifically engineered to work in conjunction with the other components in the platform resulting in a world-class structured fiber cabling system.

Maximum Densities for LC, MPO / MTP and SN-MT connectors:

DATA CENTER



CABLE SYSTEM

LC (adapter x connector x fiber)	MPO / MTP (adapter x connector x fiber)	SN / APC - MT (adapter x connector x fiber)
1RU = 96fiber (24x4x1)	MPO12 1RU = 288-fiber (24x1x12) MPO24 1RU = 576 fiber (24x1x24)	1RU = 1 152 fiber (18x4x16) 1RU = 1 536 fiber (24x4x16)
2RU = 192-fiber (48x4x1)	MPO12 2RU = 576 fiber (48x1x12) MPO24 2RU = 1152 fiber (48x1x24)	2RU = 2 304 fiber (36 x4x16) 1RU = 3 072 fiber (48x4x16)
4RU = 384-fiber (96x4x1)	MPO12 4RU = 1152-fiber (96x1x12) MPO24 4RU = 2304 fiber (96x1x24)	4RU = 1 152 fiber (72x4x16) 1RU = 3 072 fiber (96x4x16)

Connectors, Cable Assemblies & Attenuators

- Connectors, Adapters
- Patchcords, Pigtails
- Attenuators



**RIBBON
TECHNOLOGY**



QUICK-CURE™ SOC
Splice on Connector



QUICK-CURE™
Quick installable connectors



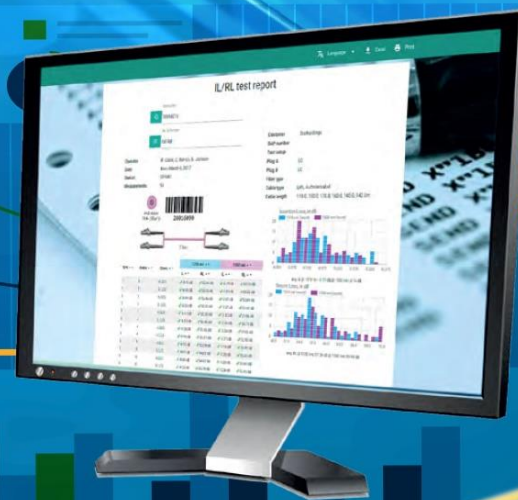
**METHOD AND TECHNOLOGY PROTECTED BY JAPAN PATENT NO.
100091683, EUROPEAN PATENT NO. 05765008.7-1234-KR2005001904.**

OPTOKON SUPERVISOR

100% OF OPTOKON OPTICAL CONNECTORS
TESTED WITH TRACEABILITY MONITORING SYSTEM.

LIFE TIME WARRANTY

**The Best
Insertion Loss
in the market
0.10 dB**

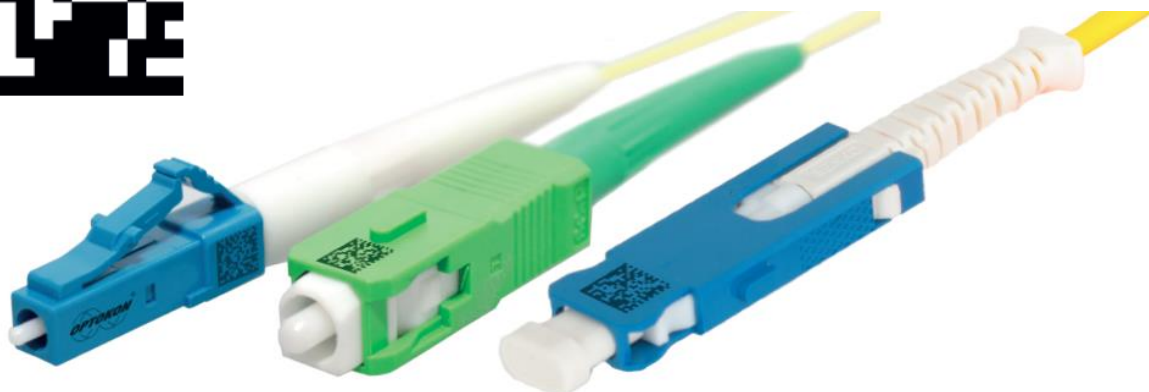
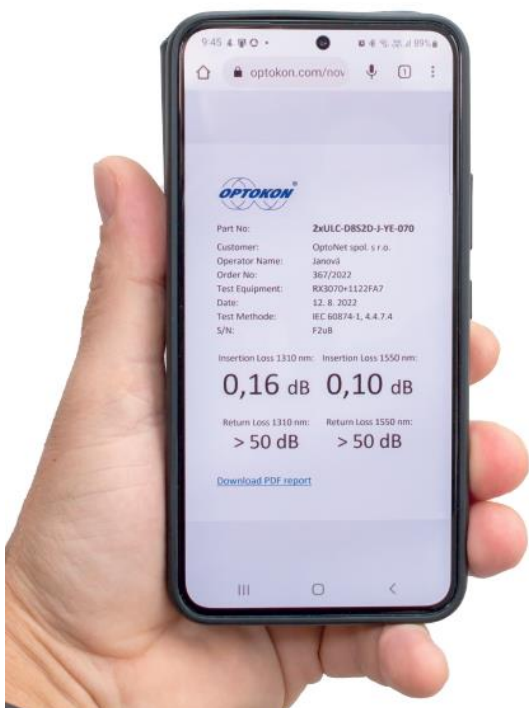


OPTOKON SUPERVISOR

QR Code marking examples

OPTOKON SUPERVISOR

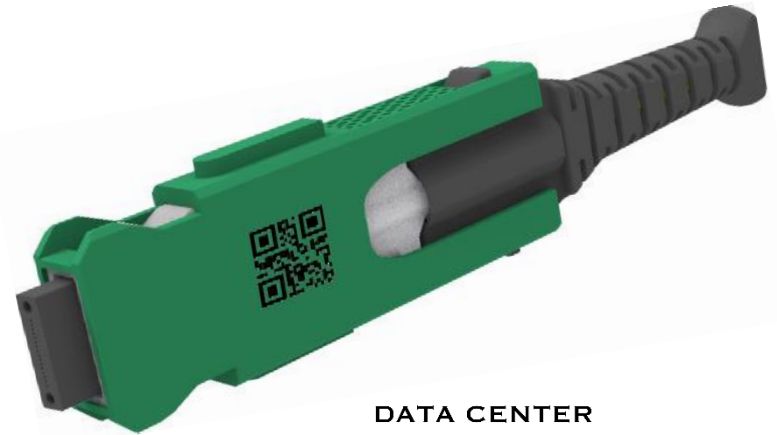
- - All OPTOKON product marked by QR or Matrix Code
- - Display of the product details by QR reader on Phone



SN-MT Connector

- Up to 16-fibers in a single row
- Same connector footprint as SN connector
- **The industry's highest density connector**
- 2.7x denser than MPO-16F
- 1.3x denser than MPO-32F
- 200 micron rollable-ribbon compatible
- Insertion loss max.0.35dB max IEC Grade B

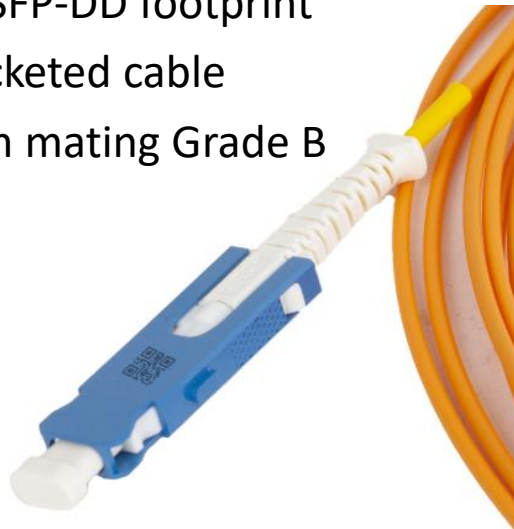
*Simplifying Leaf-Spine
Cross-connections*



DATA CENTER
DCS[®]
CABLE SYSTEM

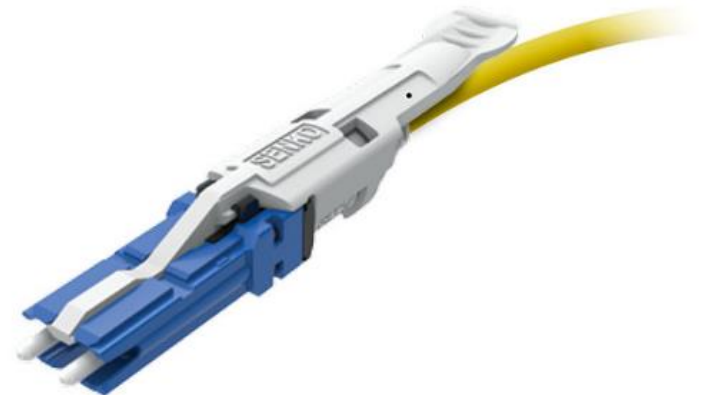
SN Connector

- **Effective size reduction compared to LC Duplex**
- Designed for OSFP/QSFP-DD Break out application
- Proven 1.25 mm ferrule technology
- 4 Duplex connectors (total 8-fibers) in OSFP/QSFP-DD footprint
- 1.6 mm jacketed cable
- IEC random mating Grade B



CS Connector

- **40% size reduction compared to LC Duplex**
- Connector adopted by QSFP-DD, OSFP and COBO
- Performance exceeds LC
- Push/Pull tab for a better usability in high density applications

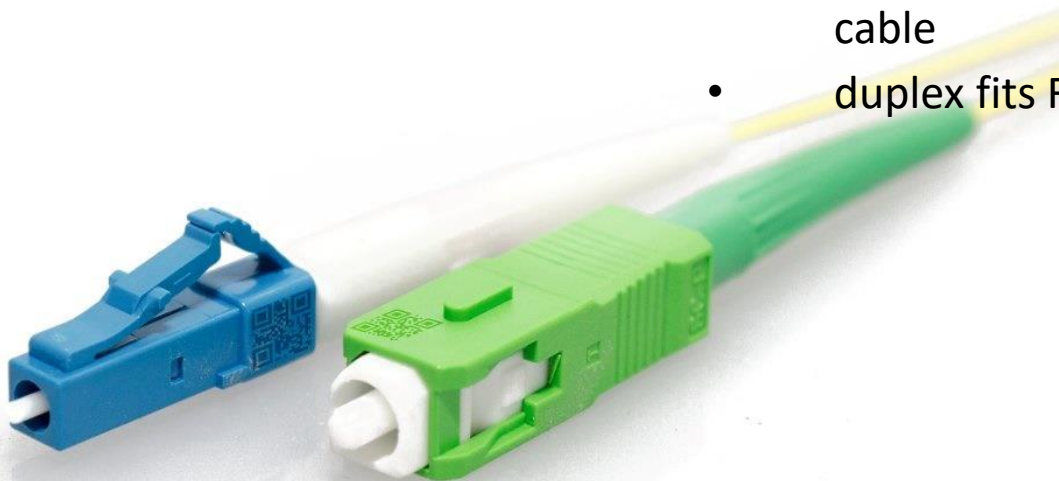


SC Connector

- Pull proof, intuitive latching mechanism
- Meets SC connector standards
- Ferrule assembly has high resolution tuning feature
- Available SM, MM simplex or duplex connector
- Ultra, PC and APC polishing (class Super was merged to Ultra)

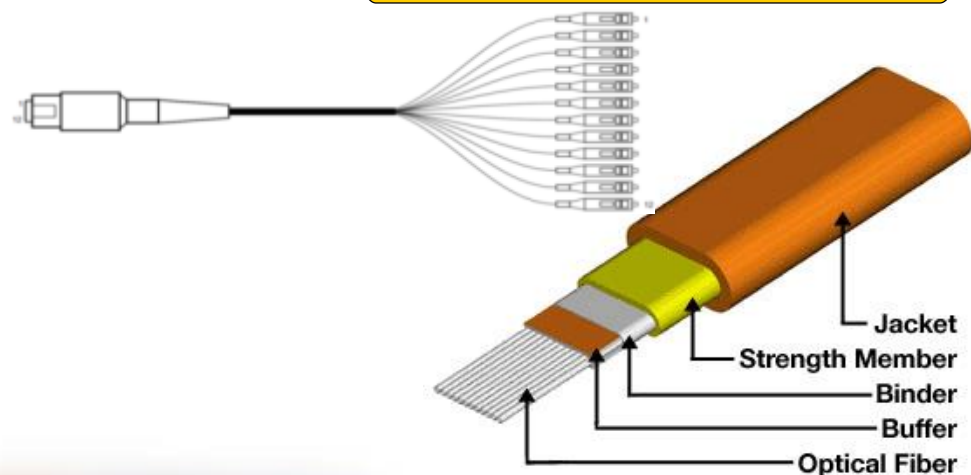
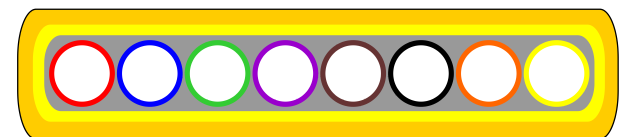
LC Connector

- one-half the size of current industry standards
- increases panel density – provides duplex connection in 50% less space
- available in SM, MM versions with Super, Ultra and Angle (APC) polishing
- pull – proof 1.6 mm simplex minicord, 1.8 x 3.6 mm duplex minizip cable
- duplex fits RJ-45 footprint



MPO (MTP) Connector Ribbon

- **12/24 fibers**
- Available SM (angled) and MM (flat) performance
- Push-on / Pull-off latching connector
- Easy connection and disconnection
- No need for matching material
- Fiber protrusion
- Low Insertion loss & Reflection
- Simple & Low cost
- IEC61754-7, TIA/EIA 604-5



Polypropylene sulfid ferrule



Couplers, WDM, CWDM, DWDM

- FBT (Fused Biconic Taper) technology
(meet Bellcore requirements ANSI/NCSL Z540-1 and CENELEC norms)
- PLC (Planar couplers)



DWDM available in a variety of packaging options for standard configurations of 4, 8, 16, 32 and 40 channels.

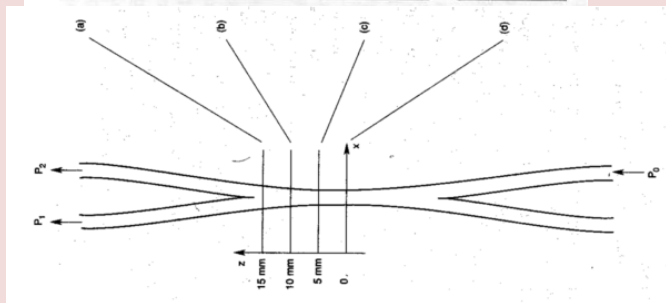
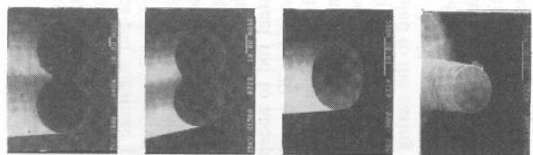


Splitters Technology

FBT (produced up to 1:8)
Fused biconic technology

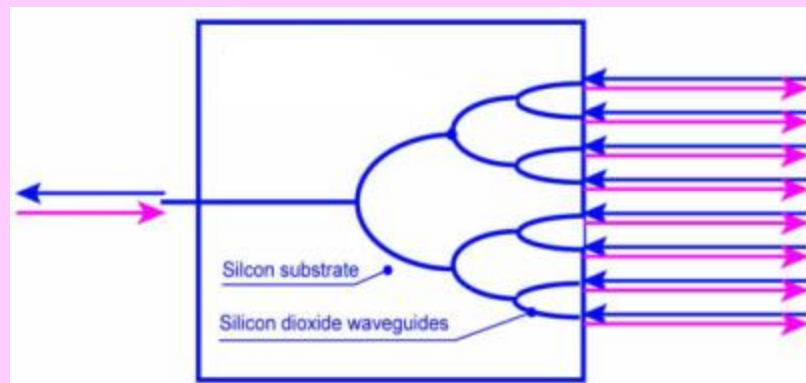


Fibers are thermally tapered and fused that the cores comes to intimate contact...



PLC (testing&packing)
Planar Lightwave Circuit

Uses lithography and etching



Splitters Configuration

FBT

coupling ratio:

Type 01x02

50/50	80/20
66/33	90/10
60/40	99/1
70/30	etc.

Type 01xN

01x03	33/33/33
01x04	25/25/25/25
01x04	70/10/10/10

variable ratio
(on request)

WAVELENGTHS:

Single mode:

1310 nm & 1550 nm (dual window)

1310 ± 40 and 1550 ± 80nm

1310 nm - 1550 nm (wavelength independent)

1250 - 1650 nm, full CWDM range

Multimode:

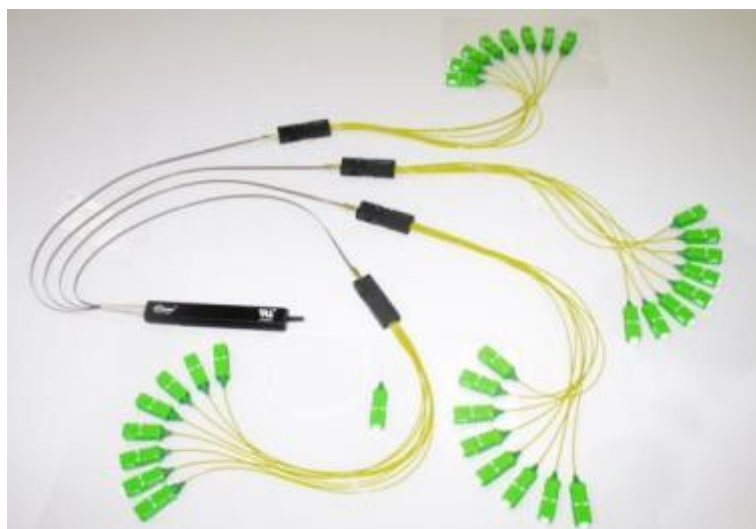
850 nm or 1300 nm (single or dual window)

PLC

coupling ratio:

- **01x02** (2x50%)
- **01x04** (4x 25%)
- **01x08** (8x 12.5%)
- **01x16** (16x 6.25%)
- **01x32**
- **01x64**
- **01x128**

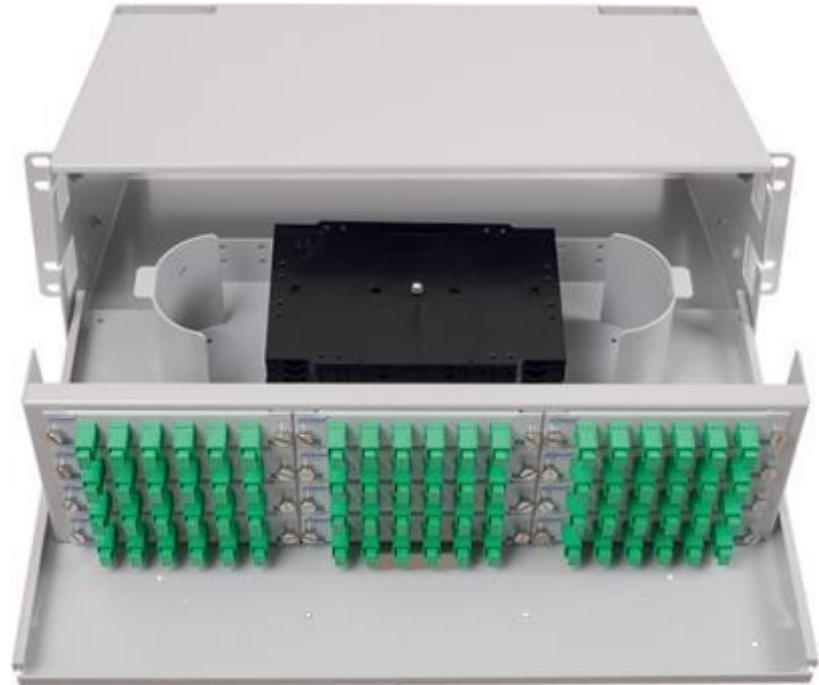
ratio fixed!



Cable Management System

... managing optical cables with OPTOKON is EASY!

- Rack Mount
- Wall mount
- End user boxes
- Outdoor
- 19" Racks
- Accessories
- Cable Closures



A green recycling symbol consisting of three arrows forming a triangle.
Eco-friendly product
Lifetime warranty

Cable Management System

... managing optical cables with OPTOKON is EASY!



Eco-friendly product
Lifetime warranty



Rack

Rack is a standardized system for transparent installation and connection of various electrical and electronic devices together with termination of cable distribution in columns one above the other in a steel frame.

Two standards:

19"

dimensions in inches
most usual

ETSI

metric units (mm)
telecoms

Main parameter – Height in number of units



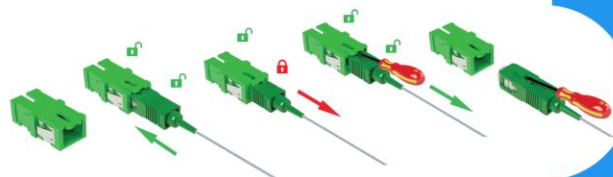
OPT-ER-2
IP41 Generic Rack

FUTURE FTTH TECHNOLOGY - Easy link



Bring fiber to the home without splicers

Easy Fiber

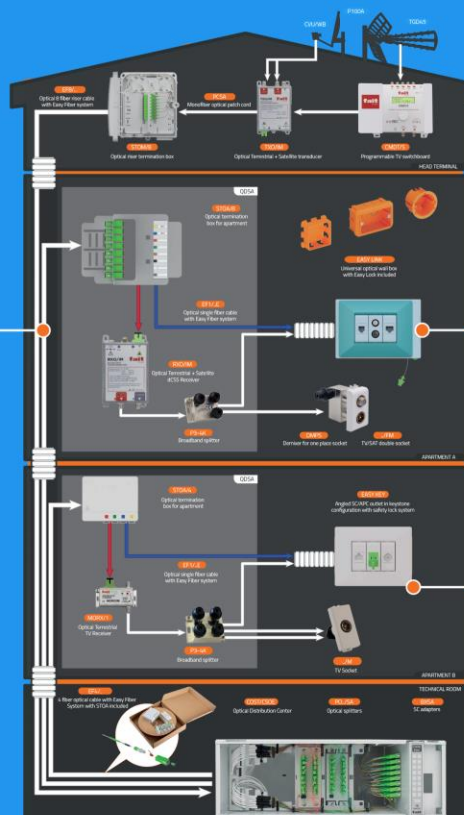


Keep your FTTH connection safe

Easy Lock

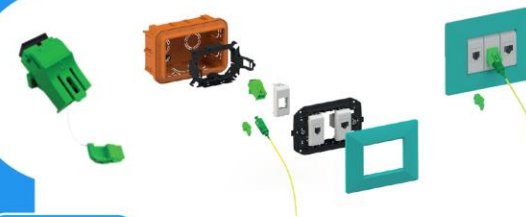
MULTISERVICE SYSTEM & Easy FTTH

The innovative way to delivery Fiber To The Home



Easy Link

Universal optical box for existing buildings



Easy Key

Angled keystone optical outlet for new buildings

PATENTED

OPTOKON Test Equipment

- Pocket Power Meter, **Ribbon Pocket Power Meter**
- Standard Power Meter and Light Source
- FTTx Power Meter and Light Source
- Loss Test Sets, 4 channel IL/RL tester
- POF Lost Test Set and POF Indicator
- Ruggedized Power Meter and Loss Test Set
- Mini OTDR **Singlemode & Multimode** version
- **CWDM Optical Analyzer**
- Precise laboratory Light source



**The PM-212 MPO cuts
larger power meters to
ribbons**

PM-215-GL

Pocket optical power meter
USB probe

**THE SMALLEST
IN THE MARKET**



OPTOKON Test Equipment

Insertion Loss test equipment:

PM-215-G(L)



LS-215-G



PM-212



**THE SMALLEST
IN THE MARKET**



Pocket optical Power Meter – Light Source
USB probe



PM-212 (SI) (M)
PM-212-MPO
PM-212-CWDM

OPTOKON Test Equipment

Insertion Loss test equipment:

Basic FO testers



FTTH testers



Loss Test Set



RL Loss Test Set



800 series

830 series

820 series

OFT-840

LS-800
PM-800
OFT-820

LS-830
PM-830

OFT-820
OFT-820-POF

IL & RL tester

Measurement various
wavelengths (MM 850, 1300
SM 1310, 1490, 1550 and others)

Wavelength:
1310 upstream
1490 downstream
1550 CATV

LS & PM in one
box

LS & PM in one
box with RL
meter

OPTOKON Test Equipment

Other test equipment:

PM-4212



**Power meter
for 4 channels**

PM for simultaneous
measurement

OFT-855D & OFT-850



SMPTE

Hybrid Cable Checker Set
OFT-855D - Made exclusively
for LEMO

LS & PM-240-MTP



**Multifiber Optical Light
Source and Power Meter**

MTP/MPO input interface
Separate photodetectors for all fibers
Up to 24 fibers testing

OPTOKON Test Equipment

Other test equipment:

OFT-840



RL tester

**Test equipment
with RL meter**

OFT-920



**Rugged tester
HMA connectors**

**Expanded Beam
Non-physical
contact testing**

PM-240 MTP/MPO/SN



**Multifiber Optical
Power Meter**

**MTP/MPO/SN input
interface
Separate photodetectors
for all fibers
Up to 24 fibers testing**

PM-4212



**Power meter
for 4 channels**

**PM for
simultaneous
measurement**

OPTOKON Test Equipment

Other test equipment:

OFT-4212



**Fiber optic 4-channels
optical testing system**

**4-fibers simultaneous
measurements SM & MM**

OFT-4820 Tester



**OFT -4820
Loss Test set**

**4- fibers simultaneous
measurements
MM and SM mode application
Light source and Power meter**

OFT-3240



**Combined wavelength
Loss Test Set**

**precise optical light source
combined with power meter
designed for laboratory use**

Reference

Supplying Fiber Optic solutions to Military end-users for more than 24 years



NATO supplier code: 1583G
WWW.OPTOKON.COM

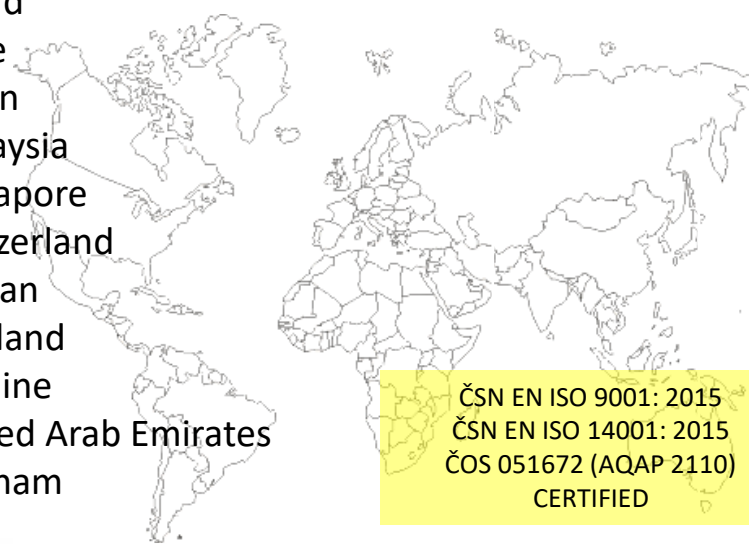


OPTOKON's NATO reference:

Albania	Montenegro
Bulgaria	Nato Mission in Afghanistan
Croatia	Netherlands
Czech Republic	Poland
Denmark	Poland
Estonia	Portugal
France	Romania
Germany	Slovak Republic
Greece	Slovenia
Hungary	Spain
Italy	Türkiye
Latvia	United Kingdom
Lithuania	USA

OPTOKON's reference list in Military Area:

Australia
Belgian
Finland
Chile
Japan
Malaysia
Singapore
Switzerland
Taiwan
Thailand
Ukraine
United Arab Emirates
Vietnam



ČSN EN ISO 9001: 2015
ČSN EN ISO 14001: 2015
ČOS 051672 (AQAP 2110)
CERTIFIED

OPTOKON GROUP KEY DATES

- 1991 - Established in the **Czech Republic** taking over the extended production program of optical connectors produced by **TESLA Jihlava**
- 1996 - **Subsidiary of USA company METHODE ELECTRONICS, Inc. & ISO 9002** approved company
- 1999 - Independent ISO 9000 **OPTOKON Calibration Laboratory** established
- 2001 - Main member of Fiber Optic normalization council **CENELEC**
- 2002 - **“NBU” (NATO) approved company**
- 2006 - Established **OptoNet Communication Ltd.** - Data network services and Optical line
- 2007 - **Expanding of OPTOKON Group** (1996 Slovenia, 2001 Ukraine, 2002 Poland, 2008 Serbia, 2008 Latvia)
- 2011 - **OPTOKON as purely Czech company & Expanding to Middle East**
- 2015 - Established facility in Malaysia **OPTOKON, Malaysia**, OPTOKON Calibration Laboratories in Kuala Lumpur & Ipoh
- 2015 - Established **OPTOKON Kable Ltd.** - Expanding to fiber optic cable manufacturing
- 2018 - **OPTOKON Testing division** according to the standard ČSN EN ISO/IEC 17025
- 2019 - Established **OPTOKON Elektronik Limited Şirketi**, Turkey
- 2022 - New **OptoNet Datové Centrum Vysočina** – Expanding data network services, Meet Tier 4 Certification
- 2022 – OPTOKON partnering with **POWERTECH ENERGY Pty Ltd** to bring the future of fibre optics to Australia
- 2023 - **Established OPTOKON Middle East for Industries**, Kingdom of Saudi Arabia
- 2023 - **Established OPTOKON Egypt**

MAIN OPTOKON REFERENCE



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