Unlimited
everywhere.

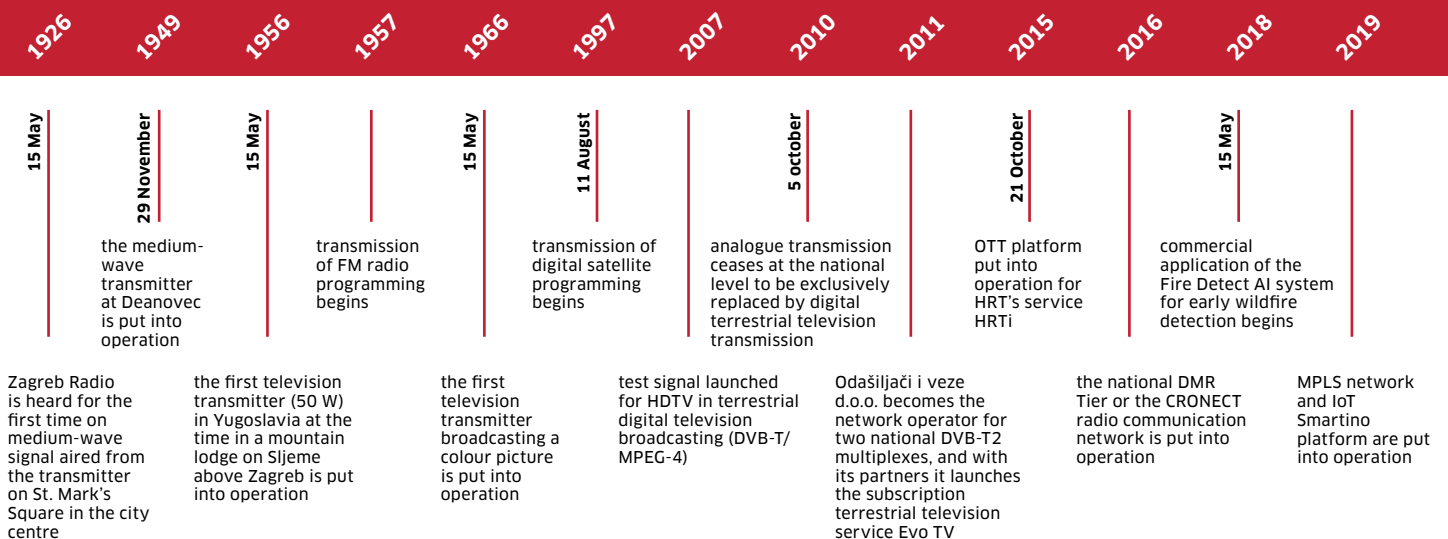**OIV** Digital signals and
networks

OIV - DIGITAL SIGNALS AND NETWORKS

We are the primary provider of national strategic communications infrastructure that offers clients reliable digital networks and platforms for the transmission and transfer of digital signals, distribution of content and transfer of data through the fibre-optic network. We develop innovative products on a secure and reliable infrastructure that facilitates the digital transformation of everyday life and business. OIV's rapid response teams and 24/7 surveillance allow for mission-critical reliability.

- Digital television and radio signals covering virtually 100% of Croatia's territory

- Providing a national infrastructure for communication, content delivery, signal transmission and Internet backbone services

- Designing, implementing and supporting content delivery platforms, digital TV and radio networks and Internet of Things LoRaWan solutions

- Professional-grade public safety services (Cronect, panoramic 360° live video, early fire detection)

- Managing over 8,000 km of a fibre-optic Internet backbone network and 5G broadband mobile internet

- Custom-tailored broadcasting and over-the-top solutions for broadcasting and media industry clients

For over 90 years, we have been an active creator and participant in the evolution of technology

1926	1949	1956	1957	1966	1997	2007	2010	2011	2015	2016	2018	2019
15 May	29 November	15 May		15 May	11 August		5 october		21 October		15 May	
	the medium-wave transmitter at Deanovec is put into operation	transmission of FM radio programming begins			transmission of digital satellite programming begins		analogue transmission ceases at the national level to be exclusively replaced by digital terrestrial television transmission		OTT platform put into operation for HRT's service HRTi		commercial application of the Fire Detect AI system for early wildfire detection begins	
Zagreb Radio is heard for the first time on medium-wave signal aired from the transmitter on St. Mark's Square in the city centre	the first television transmitter (50 W) in Yugoslavia at the time in a mountain lodge on Sljeme above Zagreb is put into operation			the first television transmitter broadcasting a colour picture is put into operation	test signal launched for HDTV in terrestrial digital television broadcasting (DVB-T/MPEG-4)		Odašiljači i veze d.o.o. becomes the network operator for two national DVB-T2 multiplexes, and with its partners it launches the subscription terrestrial television service Evo TV			the national DMR Tier or the CRONECT radio communication network is put into operation		MPLS network and IoT Smartino platform are put into operation

From OIV's Satellite and Multimedia Centre, equipped with 10 satellite transmission stations with dishes ranging from 2.4 to 7.6 m in diameter and over 20 satellite receiver dishes with diameters of 3.7 m and 2.4 m with automated de-icing systems installed, **we can transmit television and radio programming to any satellite visible from Croatian territory.**

We facilitate the HRTi OTT service for over 300,000 users who can access HRT's television and radio programming whenever they want on their smart phones, tablets, home computers and smart televisions.

With 214 existing transmitter locations, soon in the new DVB-T2 HEVC standard, **we cover 99% of Croatia's population with a free-reception digital television signal** and bring national, regional and local television programming to almost every home in Croatia free of charge.

With 77 transmitter locations, **we cover 99% of Croatia's population with FM radio signals**, while our **test digital radio DAB+ signal** covers **over 3 million inhabitants**.
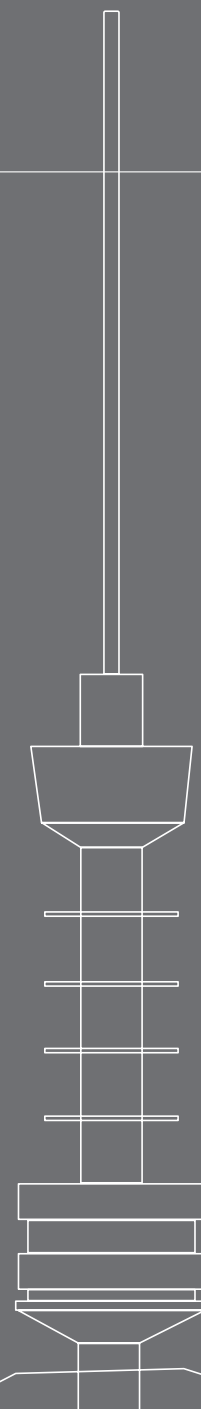
The **OIV Fire Detect AI system** with 46 observation posts and 92 video surveillance cameras **covers over half of the surface area in the four counties most threatened by wildfires**, facilitating early detection of smoke and fire, with a simulator for any fire's spread. It has already been proven effective in its first firefighting season in 2018 (39% less fires and 90% fewer surfaces consumed by fire in comparison to the 10-year average).

90.1 m

81.5 m

OIV's entirely autonomous **digital microwave link system** consists of over 300 individual links of varying capacity, **with which we can transmit tele-communications content from any part of Croatia** with very high reliability.

64.4 m

56.4 m

48.4 m

The modern core **fibre-optic network**, based on DWDM technology with a capacity of 9.6 Tbit/s, 100 Gbit/s per wavelength, **links the cities of Zagreb, Rijeka, Zadar, Split, Varaždin, Osijek, etc.**

40.4 m

32.5 m

100%
owned by the Republic of Croatia

a company of
strategic interest
to the Republic of Croatia

The company's general objectives are to enhance its market position by developing new services and maintaining and developing the electronic communications infrastructure and the related equipment.

- Reinforce its position as the leading network operator in Croatia in the field of terrestrial radio broadcasting
- Continue to expand telecommunications services, particularly by increasing telecommunications capacity in the fibre-optic network
- Continue expanding multimedia services

- Develop new services
- Monitor user wants and needs and in this regard promptly respond in all fields, particularly in telecommunications services, digital television, professional communication and new multimedia services
- Continue working to improve the quality of all services

THE BOARD

Board member - CEO:
Mate Botica

Independent
Corporate Security
Department

Corporate
Affairs Sector

Core Network
and Service
Sector

Independent IT-
communication
Service
Department

Radio
Transmission
Network
Development
Sector

Systems
Development
and Maintenance
Sector

Finance and
Operational
Support Sector

Independent
Sales
Department

Innovations help us grow without limits

We base our product and development on innovations and adaptation in line with technological advancements, market demand and user needs through the integration of our comparative advantages in infrastructure. This is why our clients recognize us as a reliable, high-quality and innovative network operator.

Our employees are dedicated to challenges

Our employees are our most valuable resource, and we constantly invest in their knowledge and skills. Many in our technical staff are certified electrical engineers, civil engineers, mechanical engineers and members of vocational guilds. Furthermore, we continually invest in our support service staff so that they can better fulfil their potential.

301
EMPLOYEES

44 years
AVERAGE AGE

50%
HIGHLY QUALIFIED

INFRASTRUCTURE FOR SECURE AND RELIABLE COMMUNICATION

We have built our infrastructure on dependable technologies above and below ground and enhanced redundant systems and the central Network Operations Centre with four regional centres, so that we can guarantee 99.99% uptime reliability for strategic national and commercial mission-critical services.

| **4000 km** of fibre-optic cables | **LoRaWAN** network for IoT | **930** transmitters | **350** infrastructure sites | **1** Network Operations Centre |

900 GB/s — optical internet backbone bandwidth

2,5 Gbit/s — digital microwave network

9,6 Tbit/s — DWDM system

Uplink — via satellite

We manage the fibre-optic infrastructure owned by the Republic of Croatia

CABLE CONDUITS
over
2,100 km

FIBRE-OPTIC CABLES(DARK FIBRE)
over
8,000 km

WE HAVE LEASED
over **2,200 km**
of fibre-optic cables

FIBRE-OPTIC INFRASTRUCTURE
used to implement the aggregate NPBBI network

National coverage

- ◉ Network Operations Centre (NOC)
- ● Regional structure (4 regional centres)
- ● Rapid response to eliminate problem situations
- ● 365/24/7 oversight

— DWDM transmission network
● adding/releasing nodes
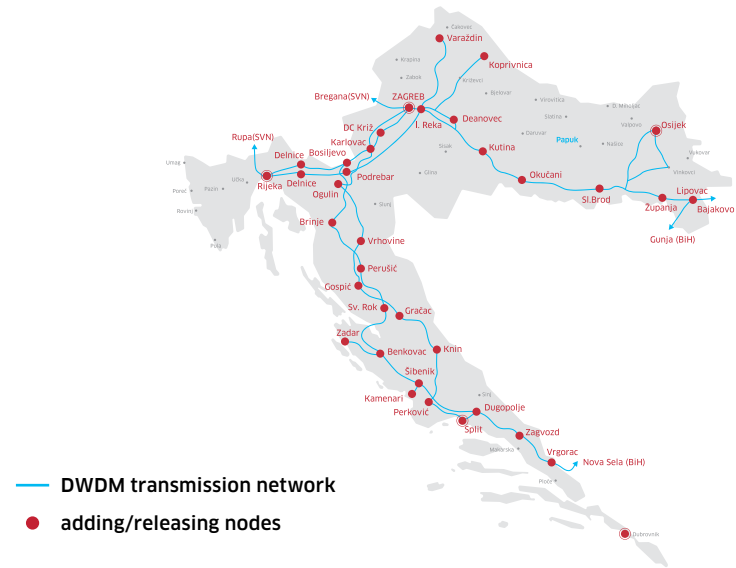
NETWORK OPERATIONS CENTER

From our own Network Operations Centre, we conduct 24/7 oversight of radio and television transmissions, telecommunications capacity, multimedia content, processing and transmission devices and equipment and infrastructure. We independently maintain devices and equipment so that we can ensure uninterrupted services.

OIV SERVICES AND PLATFORMS

Our networks and platforms cover the fields of transmission, distribution and transfer of content and IoT solutions with a high degree of security and protection.

We continually work on the development of new services and we keep pace with the needs of the market and our users so that we can adapt to the specific demands of each and every client.

CONTENT DISTRIBUTION 1
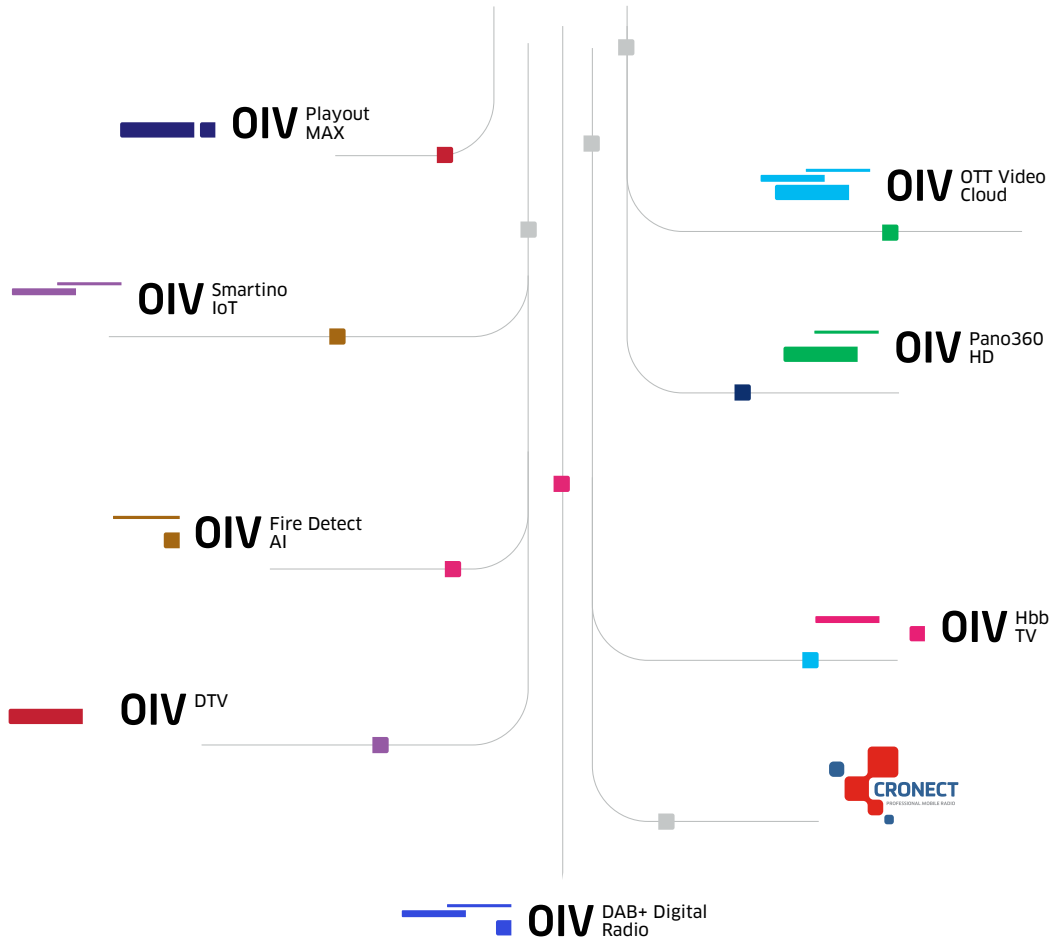
SECURITY AND PROTECTION 2

INTERNET OF THINGS (IoT) 3

PROFESSIONAL SERVICES 4

OIV Digital signals and networks

OIV Playout MAX

OIV OTT Video Cloud

OIV Smartino IoT

OIV Pano360 HD

OIV Fire Detect AI

OIV Hbb TV

OIV DTV

CRONECT
PROFESSIONAL MOBILE RADIO

OIV DAB+ Digital Radio

OIV SERVICES AND PLATFORMS

CONTENT DISTRIBUTION

1

OIV content distribution services give our clients the greatest reach in Croatia's territory, encompassing the recording and processing of content, contribution of live content and professional TV playout.

OIV OTT Video Cloud

OIV OTT Video Cloud is a video on demand (VOD) Internet platform for the distribution of video content to users in our always-connected, any-device, any-screen world.

OIV Hbb TV

OIV HbbTV is a platform that allows television broadcasters to launch, administer and monetize interactive television services, HbbTV, with the display of personalized and clickable advertising formats on HbbTV programming.

OIV DAB+ Digital Radio

OIV DAB+ digital radio provides broadcasters with the possibility of airing up to 10 channels of high-quality audio across a single radio frequency, launch new programming for more efficient segmentation of audiences and advertisers and achieve better interference-free audio quality. DAB+ radio receivers can also display related images, texts and animation.

OIV Playout All

OIV Playout Max gives users a tool to launch linear television programming for distribution via DVB-T, IPTV or cable networks, as well as the Internet. We can distribute your new television channel to the leading television operators in the region, whether you use a terrestrial signal, satellite or the Internet (OTT).

Today's audiences are increasingly demanding and always connected. That's why we launched HRTi, which gives viewers the possibility of accessing our content on any device at any time via OIV's OTT Video Cloud platforms. The OIV OTT Video Cloud service is ideal for the distribution of our content, because OIV provides a comprehensive infrastructure. All of this has made it possible for us to enhance our reach and increase our viewership.

Jozo Barišić, production manager, HRT

Nova TV was the first in Croatia to introduce OIV's HbbTV interactive television service, which allows our viewers to access the content they want to watch without registration. Our viewer response has been quite good, because now they can quickly and simply watch anything they have missed, and we are even more accessible to our viewers.

Renata Končić, presenter, Nova TV

TERRESTRIAL TRANSMISSION

For over 90 years now, OIV has provided the strategic national infrastructure for the transmission of television and radio signals to every household. The foundation for the democratic dissemination of information to citizens was built on publicly accessible television and radio services, wherein OIV has played a pivotal role.

OIV DTV / DVB-T and DVB-T2
The basic free-to-air television signal for national and local broadcasters

OIV DTV Premium / CAS
A terrestrial television signal for premium commercial services (Pay TV)

OIV DAB+ Digital Radio
Terrestrial digital radio

OIV FM Radio
Terrestrial FM radio

The transition to DVB-T2 – new opportunities for broadcasters, advertisers and viewers

Since September 2019, OIV has been building a new terrestrial digital network, which marks the beginning of a transitional period which leads to and is a prerequisite for the pending transition to DVB-T2, the new standard for digital terrestrial television with the cutting-edge HEVC (H.265) system for video compression that will be concluded by the end of May 2020. DVB-T2 HEVC brings a higher quality picture (high definition – HD) to all terrestrial television programming, as well as innovative services such as interactive HbbTV, personalized advertising formats, games, participation in broadcasts...

OIV SERVICES AND PLATFORMS

SECURITY AND PROTECTION

2

Dependable OIV infrastructure overseen from the central NOC with four regional centres, redundant systems and rapid field responses guarantee high reliability for mission-critical applications, particularly.

OIV Fire Detect AI

OIV Fire Detect AI is an early fire detection system that uses Pano360 HD cameras for 360o surveillance with an AI algorithm to recognize smoke or fire and our dependable OIV infrastructure – all integrated into the consolidated OIV FireDetect AI solution.

OIV Pano360 HD

OIV Pano360 HD offers high-quality live panoramic video monitoring with views of inhabited areas or high-altitude views. Users can integrate the HD-quality video stream into their own services or Internet and television content.

CRONECT
PROFESSIONAL MOBILE RADIO

Cronect is a professional mobile radio network and a fully reliable system that will remain operational even in cases of natural disasters or interruption of conventional communication links. Cronect facilitates voice, text or data communication.

INTERNET OF THINGS (IoT)

3

OIV Smartino IoT

OIV Smartino IoT is a multi-purpose platform for the Internet of Things. Our dependable and secure infrastructure links IoT sensors with user applications. We offer users the possibility of implementation throughout Croatia's territory, including areas that lack the Internet or even electricity.

With the help of the OIV Fire Detect AI system for early fire detection we can monitor the situation in a given county in real time on a large video wall. In case of a wildfire, we can create a simulation that shows us what will happen over the next three hours so we know how many fire-fighters we will need to bring the fire under control.

Zoran Radunić, deputy commander, Public Fire Brigade, City of Split

Implementation of the OIV Smartino IoT platforms in the smart city project has made it possible for us to gather, distribute and analyze data and information so that we can ascertain which useful data the system must generate, which will significantly contribute to strategic decision-making for further development and higher-quality services to citizens.

Damir Mandić, mayor of Karlovac
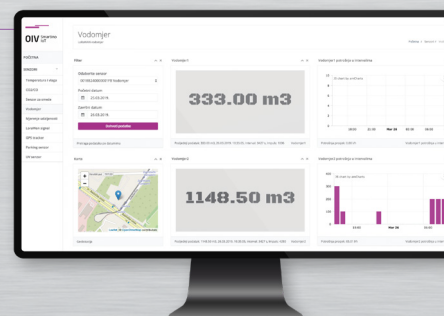
OIV SERVICES AND PLATFORMS

PROFESSIONAL SERVICES

4

OIV offers a broad spectrum of professional services, such as design and implementation of all phases of electronic communications networks and systems, installation of various types of radio and telecommunications equipment and maintenance, management and oversight of electronic communication devices and equipment.

DESIGNING SOLUTIONS
financially and technically optimized based on the requirements of our clients

We plan and design radio-communication and telecommunication networks and facilities, draft project documentation, design antennas and antenna arrays, and license programming packages for antenna arrays to transmit television and radio programming.

NOC AS SERVICE
we lease NOC support for 24/7 surveillance and maintenance

From our own Network Operations Centre, we conduct surveillance of your systems, telecommunications capacity, multimedia content and devices, and processing and transmission equipment and infrastructure. Our expert staff independently maintains devices and equipment to ensure that your services are uninterrupted.

TELEPORT AS SERVICE
satellite transmission services

Uplink/downlink of television and radio programming as a part of our multiplexes with Eutelsat 16A satellites or any other satellite visible from Croatia's territory. Transmission to Eutelsat 16A is intended for DTH (direct-to-home) distribution, i.e., for direct distribution to end users and distribution to cable distributors. Transmission may be uncoded (FTA – free to air) or coded with the help of your Viacess system, and we can implement coding and other systems depending on your needs.

LEASING OPTICAL CABLES AND DATA TRANSMISSION
cable leasing services through a variety of transmission systems

Digital microwave link systems, which imply a high-capacity network based on SDH technology and access links in cities, optical link systems based on DWDM and CWDM technology. The service is rendered via highly reliable systems with a very high degree of redundancy. The telecommunication capacity system entails the most diverse technological platforms (PDH/SDH, Ethernet/GbEthernet, IP/MPLS) and high-speed data transmission.

Services we provide to our clients in Croatia

DVB-T, DVB-T2 and DVB-S	DAB+	Cronect	OTT Video Cloud and Playout Max	Pano 360° HD	Smartino IoT	Fire Detect AI	Optical cable leasing
Digital transmission of terrestrial and satellite TV and radio signals	**Transmission locations:** Učka Sljeme Ivanščica Belje - Đuro Podboj Brač	51 base stations in operation	New services: HbbTV	Surveillance cameras on OIV facilities with transmission network	Smart cities, smart buildings, smart agriculture, environment and tourism	92 cameras 43 locations	Over 2,200 km of fibre optic cables leased
Users: HRT RTL Croatia Nova TV Evo TV and local TV broadcasters	**Projected 2020.:** Psunj, Ugljan and Srd	**Users:** Fire fighting brigades, Mountain Search & Rescue Service, Plovput, National forest management company, City of Dubrovnik, Agriculture Ministry, National air traffic control service, National electricity utility, National water management company	**Users:** HRT OTT platform HRTi	**Users:** National air traffic control service Tele5	**Users:** City of Karlovac	**Users:** Split-Dalmatia County	**Users:** Tele 2 A1 Carnet
	Users: national and local radio broadcasters						

Services we provide to foreign markets

IN THE REGION

We are actively present in countries in the region where we continually expand our consulting services and provide design, installation and maintenance of digital terrestrial television systems (Serbia, B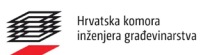osnia-Herzegovina, Kosovo and Macedonia). **OIV Fire Detect AI** – will be available on the markets of Montenegro, Albania, Greece and Italy. We have provided satellite transmission services to Montenegro's national public radio and television broadcaster, RTCG, on Eutelsat 16A.

EUROPE, THE MIDDLE EAST AND AFRICA

Through our partner companies, we can provide the following services on foreign markets: OTT Video Cloud, NOC as Service, Teleport as Service and Playout Max. OVM Technology Alliance is a partner company consisting of OIV digitalni signali i mreže, VGP and Meratech for the joint rendering of network and infrastructure communications services.

Memberships in influential national and international associations

broadcast networks europe

DV3

world dab

HZN

RIPE NCC Member

C|X

hroug

HUP — Hrvatska udruga poslodavaca

Hrvatska komora inženjera građevinarstva

ELEKTROTEHNIČKO DRUŠTVO ZAGREB

Project Management Institute.

Integrated management systems

BS OHSAS 18001

ISO 9001:2015

ISO 14001:2015

ISO 50001

Fascinated by Quality

OIV Digital signals and networks