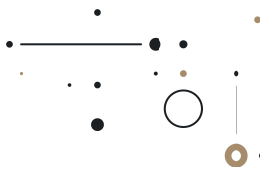




NAG | TELECOM EQUIPMENT  
& SOLUTIONS

IBC2018, RAI AMSTERDAM

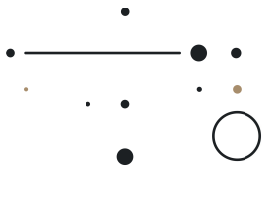




Over the past few years the market and the TV industry have been changing rapidly. Driver are the growing needs of the audience. And it's not just that people are becoming more demanding, but also in the change of generations. The new generation is deeply integrated with new technologies and entertainment since childhood. This trend is a challenge for developers of TV and OTT solutions and makes it faster to adapt their products to new technologies. NAG develops advanced products that will allow you to always provide the most advanced services.

- NAG - follow the expert.

Dmitry Samodelko | CEO

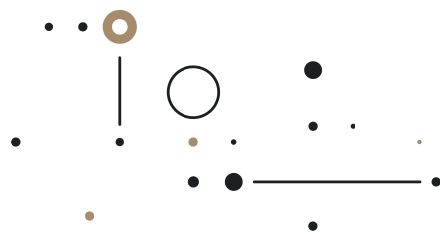


- NAG is a leading russian developer and supplier of solutions and equipment for telecommunications, industries and business. For 15 years we create data networks and security systems, build data-centers.
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## WE OFFER PRODUCTS BY OUR OWN AND TURNKEY SOLUTIONS







WE DESIGN PRODUCTS FOR COMPREHENSIVE EQUIPMENT OF IT INFRASTRUCTURE

SWITCHES, SERVERS

ROUTERS

OPTICAL CABLE

OPTICAL MODULES AND COMPONENTS

MEDIA CONVERTERS

VOIP AND TELEPHONES

TV EQUIPMENT

WAVELENGTH DIVISION (WDM) SOLUTIONS

SYSTEMS OF DATA STORAGE

WIRELESS EQUIPMENT

VIDEO SURVEILLANCE

GPON/GEAPON

UNINTERRUPTIBLE POWER SUPPLIES (UPS)

NETWORK CABINETS

COMPONENTS OF STRUCTURED CABLE SYSTEM

TOOLS AND ACCESSORIES

AUTOMATION AND MONITORING

MOBILE DATA PROCESSING CENTERS



Artem Egorov | Head of CaTV Solutions Division

- NAG company is the developer and supplier of a full range of equipment for the construction of CTV systems: from subscriber devices to headends. NAG cooperates with manufacturers of television equipment and large content providers in CIS countries.
- We offer equipment for the construction of cable TV networks (equipment for headend stations, optical transmitters, optical receivers and amplifiers, optical splitters).
- Well known NAG product in CIS market is the set-top boxes Vermax. They are used in the Russian telecom operators networks including operators from top 10 Russian biggest telecom companies.



## STB

Multimedia 4K IPTV UHD X set-top box of Vermax brand is the third generation of such devices manufactured by NAG. UHD X Vermax was created specifically for telecom operators to meet their needs. Vermax STB are used on networks of more than 300 operators, each of which presents its own unique requirements. As a result, the devices acquired the following features:

- Compactness
- Guaranteed relevance of technology - 5 years
- Possibility of customization
- Bluetooth connection\*
- Support a large number of middlewares
- Android 7.1.2

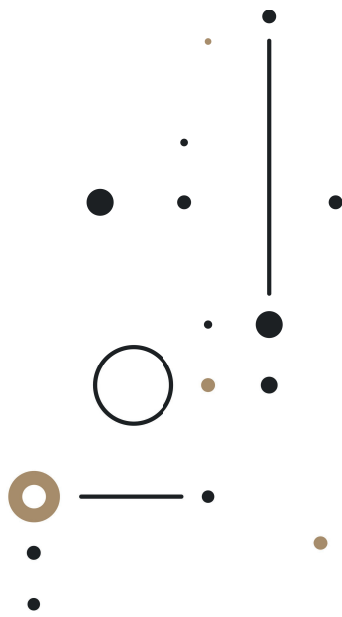
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\* for models UHD200X / UHD300X



### Configuration Variants:

- UHD200X - WiFi 802.11n 2.4GHz+BT
- UHD250X - without WiFi
- UHD300X - WiFi 802.11ac 2.4 / 5GHz+BT



## OPTICAL AMPLIFIERS

In the line of Vermax optical amplifiers there are models with the number of outputs from 1 to 32 and a wide power choice per port. We offer the power at a particular port and not the total power of the pump unit.

The full range of models is available, including options with built-in optical switch or PON add-drop. In production, only new lasers and high-quality components are used.



## OPTICAL TRANSMITTERS

In the line of optical transmitters Vermax there are models with both internal and external modulation. Clients can find transmitters with the required power, in the right configuration and with unchanging high signal quality.

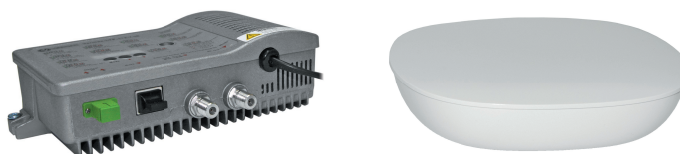
When developing Vermax equipment, we always take into account the wishes of telecom operators.



## OPTICAL RECEIVERS

Vermax optical receivers are available in various form factors for indoor and outdoor installation with a wide range of input and output power. The devices come with 1 or 2 input optical ports, can be equipped with a network monitoring and management module. All models have a full set of demanded technologies: AGC, indication, electronic signal level adjustment, etc.

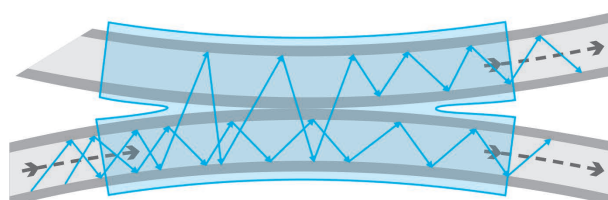
Some models are equipped with a module for connection to PON-networks.



## FIBER COUPLERS

NAG supplies a full range of optical splitters of its own brand SNR, fused and PLC, with any number of inputs and outputs, which allows to build any topology. The reliability of the supplied devices is checked by the harsh climatic conditions of Russia.

A significant volume of deliveries the splitters to Russia and the CIS countries makes it easy to arrange shipment of a large consignment within a reasonable time.



A full range of optical receivers, amplifiers and transmitters Vermax, supplemented with SNR optical and coaxial splitters, allow the construction of cable TV networks of any complexity and purpose.



Sergey Taskin | Head of VoIP Systems Division, NAG

The portfolio of NAG includes solutions for video telephony and IP telephony systems. These products are in great demand among integrators and telecom operators.

### IP VIDEO PHONE

SNR-VP-80-P

The SNR VP-80 is a multimedia IP phone based on the Android Operating System. The phone features a 7" touch screen with a resolution of 800x480 pixels and supports for 6 SIP accounts. The model VP-80 will give access for user to video calls, any applications from the Play Market. Supports of most modern interfaces will simplify the work with the network and extras.



### IP PHONE

SNR-VP-53W-P

The SNR VP-53 is an exclusive ip phone. The color «white» is a main feature ip phone. The phone is a popular in medical facility. The SNR VP-53 has support 3xSIP accounts, settings VLAN, headset jack and PoE.



### IP PHONE

SNR-VP-52

The SNR VP-52 is an entry-level business IP phone. The phone is a popular among integrators and telephone operators.

The phone SNR VP-52 has features: 2x SIP account, VLAN configuration, headset jack, PoE

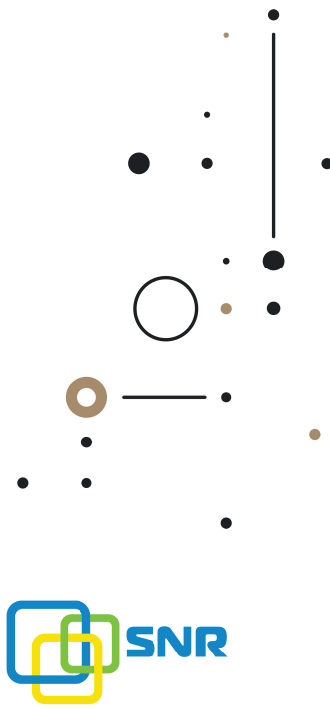




Mikhail Vanyashkin | Head of Wireless Equipment Division

## WIRELESS SOLUTIONS

The NAG company is a comprehensive provider of wireless solutions, we offer to customers equipment for solving tasks from home wi-fi to high-performance wireless radiolinks. We offer equipment of our own brand SNR, we cooperate with the world's leading suppliers of wireless equipment - Cambium, Extreme, Ruckus, Ubiquiti, Mikrotik.



### WIRELESS ROUTER

SNR-CPE-MD1.1

Dual-band wireless router 2.4GHz 300Mbps, 5GHz 433Mbps, 4xLAN + 1xWAN 10 / 100Mbps, support for wireless roaming 802.11k / r, Handoff, HotSpot.



### WIRELESS ROUTER

SNR-CPE-ME1

Dual-band wireless router 2.4GHz 300Mbps, 5GHz 433Mbps, 4xLAN + 1xWAN 10 / 100Mbps, support for wireless roaming 802.11k / r, Handoff, HotSpot.





Pavel Shpilko | Head of Servers and Network Equipment Division

## SERVERS

Reliable and productive SNR servers for a different budget allow to perform a wide range of tasks, and can be configured by NAG specialists.

Unlike the bulk of cost effective solutions, servers are distinguished by high quality of materials, components and reliability. The servers are equipped with a full set of accessories (disk trays, rack rails, power supplies, heatsinks, etc.) and are guaranteed for 2 years.

## SNR SERVERS

Server platform SNR-SR1104R, 1U, E3-1200v6, DDR4, 4xHDD, redundant power supplies

An energy-efficient server platform for rack-mounting. It is designed for a variety of applications serving small and medium businesses, web servers, file and print servers, mail servers, and servers for storing a small volume of data. The platform supports processors with high frequency, the E3-1200v6 series. Disk subsystem allows to organize storage up to 40TB. Two power supplies of 550W are responsible for power backup.



## SNR SERVERS

Server platform SNR-SR1204RS, 1U, Scalable, DDR4, 4xHDD, redundant power supplies

Universal compact 1U high-performance server platform SNR-SR1204RS. It is designed to perform a wide range of tasks, build servers of high processing power, billing, databases (DB) and other roles. The platform implements the support of the latest innovative Intel Xeon Scalable processors.





Anton Beygul | Head of Video Surveillance Systems Division

## VIDEO SURVEILLANCE

Modern person is surrounded by video surveillance and other technical means of control. CCTV system is a marketable product, the availability and quality of which influences at basic need of any person: safety of him and his family.

NAG company offers a full range of equipment for building complex security systems.

- IP-video surveillance is presented by well-known brands: OMNY, DAHUA, SNR.

- Analog video surveillance is presented by HDCVI from DAHUA - high quality standard PoE equipment: injectors, switches, splitters, extension cords

- IP Video door phone from DAHUA

- Software (Macroscop, Forpost, Trassir)

- Accessories and components for video surveillance: active microphone, control panels, casings, brackets, installation equipment, hard drives for video recorders, etc.

OMNY

POWER TONE



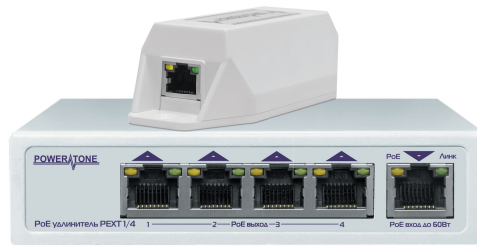
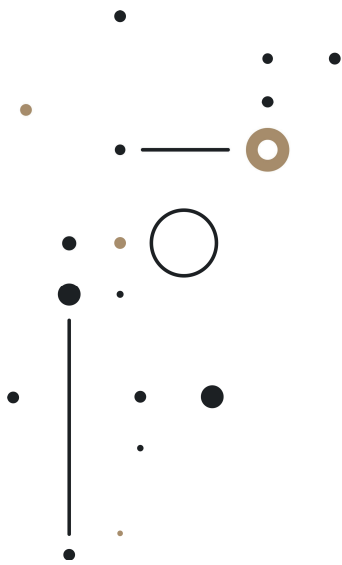
## OMNY LUNA

WiFi office / home cloud camera

OMNY LUNA is an excellent product for network operators. The camera has a number of basic functions:

- WiFi 2.4GHz (optional 2.4 / 5GHz)
- 1080p / 1440p resolution
- Microphone / Speaker
- MicroSD up to 128GB
- IR illumination up to 10m
- H.265 codec
- Wide viewing angle 110grad





## PEXT

PoE line of Ethernet Extenders PEXT from POWERTONE

PoE extension cables of IEEE802.3af and IEEE802.3at standards work with any PoE-devices and can be used to increase the copper link by 200, 300 and 400 meters with multiple use.

PEXTs do not require external power, operate from the transmitted PoE, consuming not more than 2 W. This is the minimum value of power consumption among all devices of this class. And PEXT 1/4 is the most convenient way to expand 1 PoE link for 4 devices.



## INJECTORS

1 - port injectors from POWERTONE

1-port POWERTONE injectors are simple and reliable devices for the formation of PoE in the line (single-channel).

Full range of single-port injectors in the line: from passive PoE up to 60 watts PoE 802.3bt

- Operation over a wide voltage range of 100-240 V AC
- Plastic or metal casing



## OMNY ALFA

The line of mini cameras without wires - OMNY ALFA

Special IP cameras for different projects with high picture and sound quality. The special design makes the camera installation reliable. Installed camera looks better than others, because for its installation the installation of a switching box is not needed.

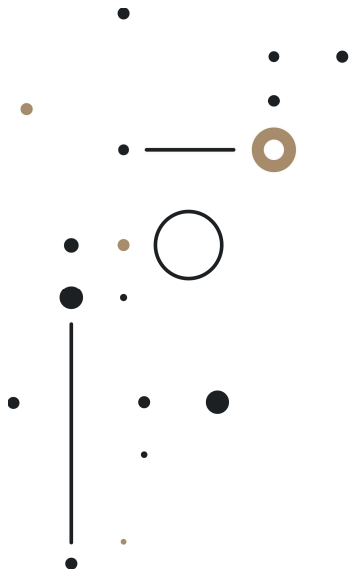
- Resolution 2-5Mp
- H.265 / H.265 +
- Starlight technology
- MicroSD up to 128GB
- Concealed cable installation



Artem Enborisov | Head of Active Network Equipment Division

### ACTIVE NETWORK EQUIPMENT

SNR Switches is a case-proven high performance networking solution designed to meet the requirements of SMB, Enterprise and ISP networks. Wide-range product portfolio provides our customers an opportunity to solve their cases in the most efficient and convenient way.



## SNR-S2985G-24T-UPS

Layer 2 Ethernet Switch SNR-S2985G-24T-UPS 24 GigaEthernet + 4 SFP with UPS

High performance gigabit Ethernet switch purposely built for ISP's Points of Presence with high SLA requirements. The model is equipped with 12V DC input and acting as a UPS for a 12V battery. The solution is capable to provide 8 hours uptime with regular 12Ah battery.



## SNR-S2990G-48TX-POE

Layer 2 Ethernet POE Switch SNR-S2990G-48TX-POE 48 GigaEthernet+2 SFP+ 2 SFP+

This switch is designed for high-loaded PoE networks with power consumption upto 30W per port and able to provide 15W power to all 48 ports simultaneously. It's perfect solution for Enterprise networks providing flexible user authentication based on client's mac-address or native 802.1X handshake.



## SNR-S2995G-12FX-UPS

Layer 2 Ethernet POE Switch SNR-S2990G-48TX-POE 48 GigaEthernet+2 SFP+ 2 SFP+

Industry first compact fiber switch with a build-in UPS to connect 12V DC battery. It can provide you whole day of non-stop forwarding using single battery.

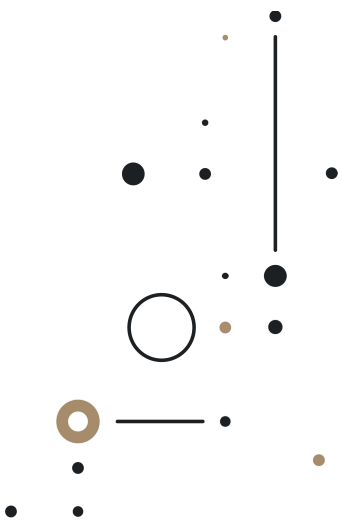


## SNR-S300G-24FX

Layer 3 Ethernet Switch SNR-S300G-24FX 16 Combo GigaEthernet+8 SFP+4 SFP+

S300G is an intelligent series of SNR switch family.

It can be easily used as TOR-switch for DC servers Gigabit interconnection or as IP/MPLS PE to provide scalable underlay network. Combo ports allows you to connect devices in convenient way. Stacking and dual hot-swap AC/DC power supply provide required level of redundancy.





Dmitry Polyakov | Head of Automation and Monitoring Division

## ABOUT REMOTE CONTROL AND MONITORING

NAG company develops and manufactures equipment and solutions for remote monitoring and control for 11 years. During that time, we passed the way from one simple device for reloading hanged equipment to hardware-software platform. Our solutions are used on a variety of objects: from small communication nodes to large data centers. The system allows receiving data from various sensors and energy counters, accumulating and analyzing information.

## INTERNET OF THINGS, IOT

SaaS solution for collecting data from counters, monitoring the status of objects and energy consumption analytics.

ERD is the IoT controller completely developed in Russia. ERD allows:

- Supports MQTT, WEB, SNMP, GSM, SMS, 1WIRE, RS232/485
- Monitoring availability of voltage, opening sensor condition, DIO
- Remote restarting hanged equipment manually or in automatic WATCHDOG mode
- Monitoring temperature changes and automatically maintain the set index (PID)
- Fixing leaks (AQUASTOP)
- Monitor the state of the sensors
- Monitor the status of fire alarm sensors



ERD application areas:

- Data center
- Server room
- ATMs
- Base stations
- Communication nodes



Evgeny Zykov | Deputy Head of Optical Transport Systems Division

## OPTICAL COMPONENTS

NAG is dedicated to research, develop and sale a diverse portfolio of high-performance, optical transceiver modules for various applications, such as Data Centers, Telecom Networks, Video Networks and etc.

NAG supplies the industry's broadest transceiver portfolio with world-class quality and reliability.



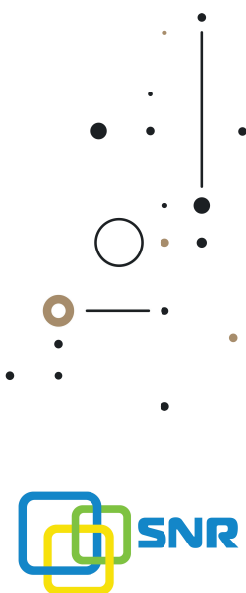
## 100G+ TRANSCEIVERS

By using SNR optical transceivers it is possible to build optical network of any complexity.

Portfolio includes all currently used form factors including QSFP28/QSFP-DD 100G/200G for metro networks and DCI. Our optics is compatible with most global equipment vendors.

We are using top market technologies while manufacturing our optics thus we guarantee high reliability of your network.

NAG owns manufacturing on all stages and we are independent from other suppliers. Our cost effective offering is the best in quality in the market.





Tatyana Ibakaeva | Deputy Head of Infrastructure Solutions Division

## CONTAINER TYPE DATA CENTER

The NAG company - infrastructure integrator - develops and builds Container Type Data Center on the basis of the equipment of the company's trademarks SNR, Metal Box, Tesla Power, ERD, Omny, etc.

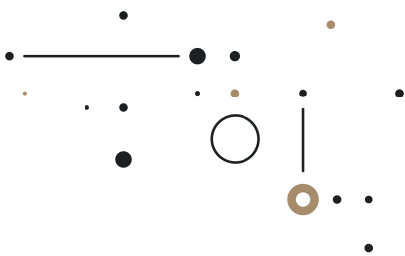
For construction of the container we use technical solutions and materials tested by time and northern climatic conditions. Several hundred such containers for years serve in the oil industry. The unique design solutions allow them to withstand the heat and cold equally easily.

The overall dimensions of the Container Type Data Center allow it to be transported on a low-floor trawl.

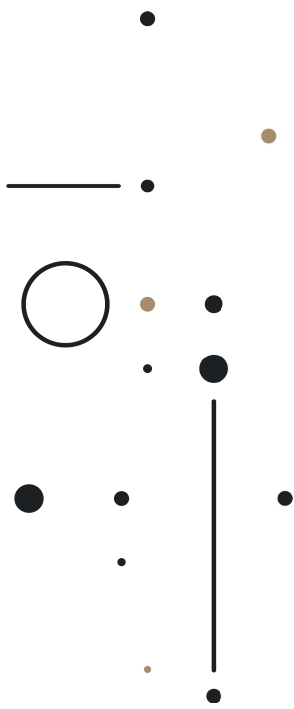
The infrastructure of the DataBox Container Data Center includes the following systems:

- Guaranteed power supply (UPS and diesel-generator sets);
- Precision air conditioning with the necessary level of system redundancy;
- A comprehensive security system (gas fire extinguishing, fire alarm, access control and video surveillance);
- Automated dispatch control system;
- Cable and network equipment.

DataBox deploys in a fairly short period of time and with reasonable starting capital investments.







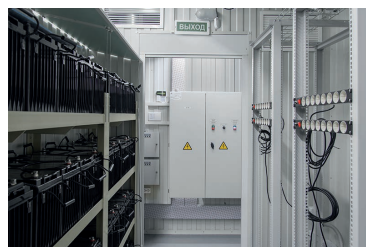
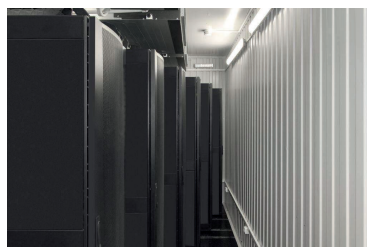
Each project is unique: the systems are created with consideration customer's requirements. The following typical modifications are presented in the line of Container Type Data Centers from NAG:

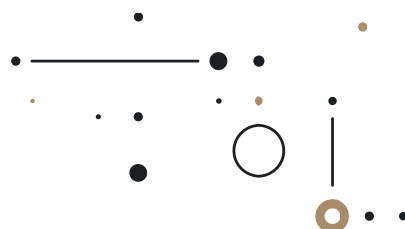
- Container Type Data Center, 12m, 14x40U (560U), 140kW
- Container Type Data Center, 9m, 9x40U (360U), 90kW
- Container Type Data Center, 6m, 6x40U (240U), 60kW
- Container Type Data Center + diesel generator, 12m, 8x40U (320U), 80kW
- Container Type Data Center + diesel generator, 9m, 4x40U (160U), 40kW

General characteristics of Container Type Data Centers:

- Maximum load on the rack 12kW
- Operating temperature range -40 ... + 40C
- Range of temperature limits -50 ... + 45C
- Temperature inside Container Type Data Center (manually set) 18 ... 25C

The NAG company conducts projects from pre-project survey to commissioning, personnel training and after-sales service.





## WE ARE PROUD OF OUR CUSTOMERS



DATAIX - traffic exchange network between operators and content generators Russia, European and Asian countries.



Gazprom is a global energy company focused on geological exploration, production, transportation, storage, processing and sales of gas, gas condensate and oil, sales of gas as a vehicle fuel, as well as generation and marketing of heat and electric power.



Under the Beeline brand, VEON Group offers integrated mobile and fixed telephony, long distance, data transmission, telematics services, Internet-based wired and wireless solutions, including fiber access technology, WiFi and third generation network. The brand serves individuals, small, medium and large companies and multinational corporations in Russia and CIS.



Rostelecom is the largest digital services provider in Russia. The Company operates in all segments of the telecommunications market and covers millions of households across the country.



DOM.ru (ERTelecom) - provider of full-range communication services for business and individuals,





Megafon is the second largest mobile phone operator[3] and the third largest telecom operator in Russia



Saint Petersburg Stadium, also referred to as Zenit Arena is the recently opened new stadium of FC Zenit. Capacity of the stadium is 56,196 for regular league matches, and was increased to around 68,000 for the World Cup 2018.



Mail.Ru Group is a Russian Internet company. Mail.Ru's sites reach approximately 86% of Russian Internet users on a monthly basis. Mail.ru holds 100% of shares of Russia's most popular social network VKontakte and minority stakes in Qivi, formerly OE Investments (15.04%). It also operates two instant messaging networks (Mail.Ru Agent and ICQ), an e-mail service and Internet portal Mail.ru, as well as a number of online games.



MSK-IX accelerates communications between Internet companies by providing neutral Internet eXchange for IP peering and global distributed network of DNS servers for top-level domains. More than 500 organizations use MSK-IX services on a daily basis to enhance network connectivity in 10 cities. MSK-IX participants include ISPs, social networks, search engines, cloud providers, corporate and educational networks.



Sberbank today is the circulatory system of the Russian economy, accounting for one third of its banking system. The Bank provides employment and a source of income for every 150th Russian family. Sberbank today is 14 territorial banks and over 16 thousand branches throughout the country in all 83 constituent entities of the Russian Federation located across 11 time zones.



RETN is a leading international network service provider. More than 600 international and local carriers and 500 corporate customers use various RETN network telecommunications services to transmit their data with superior performance from multiple locations worldwide.



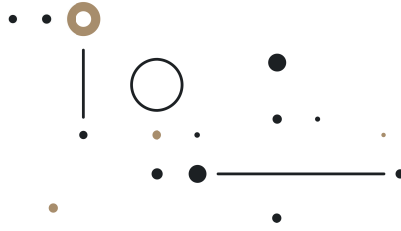
TTK is one of the TOP-5 Russian Telecommunication companies. The company operates one of the largest fiber networks in Russia, which is more than 76 000 km long. TTK implements large-scale telecommunication projects and introduce a full range of telecommunication services for other state companies and end-users.



Tele2 is a federal telecom operator. The company works in 65 regions. Tele2 network is based on its own infrastructure. Tele2 became a leader in the MVNO development and created virtual network operators together with Rostelecom, Sberbank, TransTelecom, Tinkoff Bank and others.



MTS is the leading telecommunications group in Russia and CIS countries. The company provides a range of mobile and fixed-line communications-based services: fixed-line services, including fixed voice, broadband internet, and pay-TV.



## OUR OWN TRADEMARKS



SNR - a complete range of telecommunications equipment from cables and connectors up to distributed data transmission networks and data centers



NAGruzka - HW/SW solution for automation of resource accounting



TeslaPower - power distribution systems for data center elements



MetalBox - premium class server cabinets



Powertone - reliable PoE-equipment



OMNY - CCTV equipment and solutions



LAVA - enterprise-solutions for IP-telephony



DataBox - Container Type Data Center



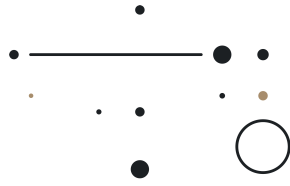
ERD - Internet of Things (IOT) devices



Vermax - equipment and solutions for building digital television systems



AlphaMile - PON equipment



## CONTACT US

[ibc@nag.ru](mailto:ibc@nag.ru)



Dmitry Grudyaenko | CBDO  
[d.grudyaenko@nag.ru](mailto:d.grudyaenko@nag.ru)



David Rapoport | Advisor to the CEO for Business Development  
[d.rapoport@nag.ru](mailto:d.rapoport@nag.ru)

