



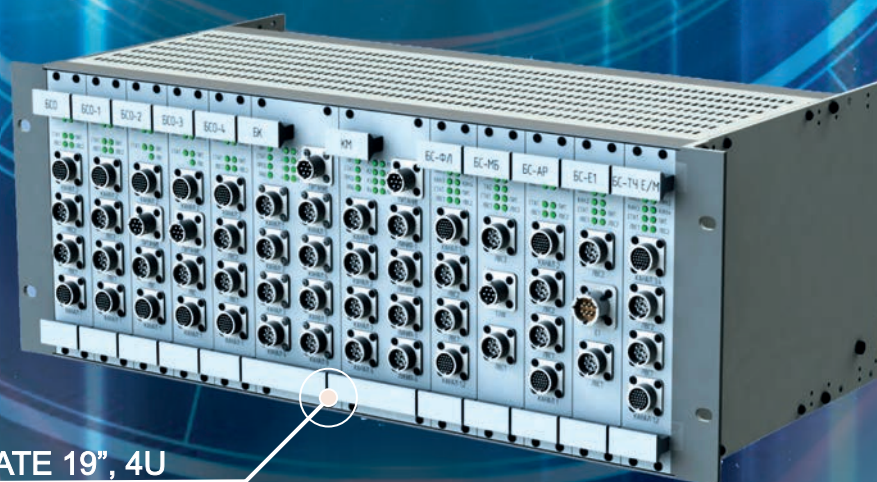
Unified Vehicular Intercommunication and Control System



R-188 «UKUS»

Keeping up the traditions
we are ahead of the time...

Unified commander control unit



Version CRATE 19", 4U



Constant communication!

JSC «Sarapulsky Radiozavod» is a unique page in the history of the Russian radio industry.



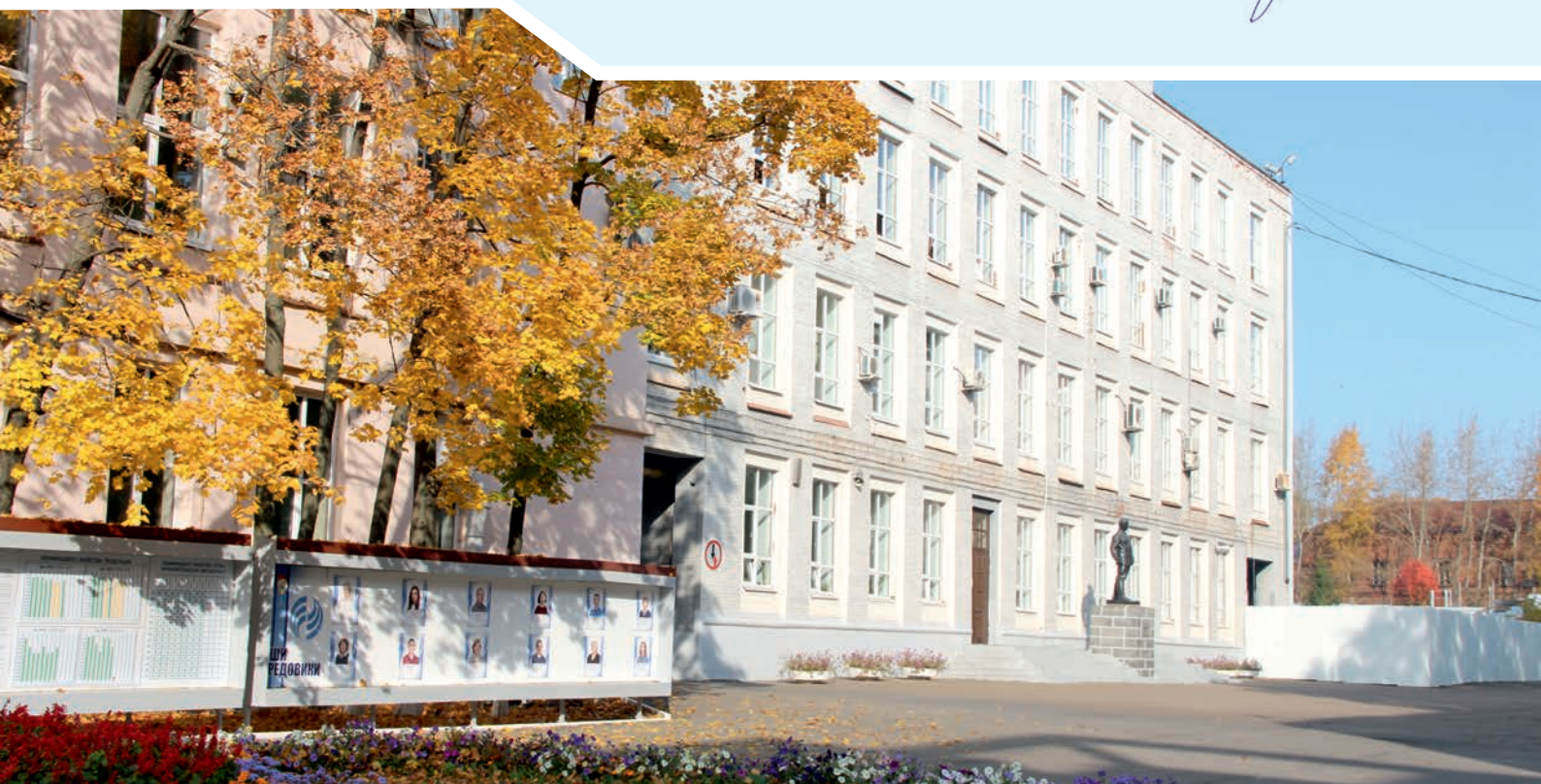
Kirill R. Abdrakhmanov,
CEO of the JSC «Sarapulsky Radiozavod»

For more than hundred years our enterprise works for increasing the defense potential of the country. During this time the enterprise gained popularity as manufacturer of the high-quality radio equipment for commercial purpose and for special appointment.

Today experience and united work of the staff allow designing and producing of radio facilities, which do not have analogs in Russia, with whole new level of data processing, delivery and protection. Effective systems and complexes of communication are demanded not only in the Russian Defense Ministry, but also in other institutions.

Products of new generations for us are guarantee of execution of difficult tactical tasks in providing safety of the country and protecting the lives of staff of special squads.

In the work we rely on responsible partners and always are open for mutually profitable business relationship.

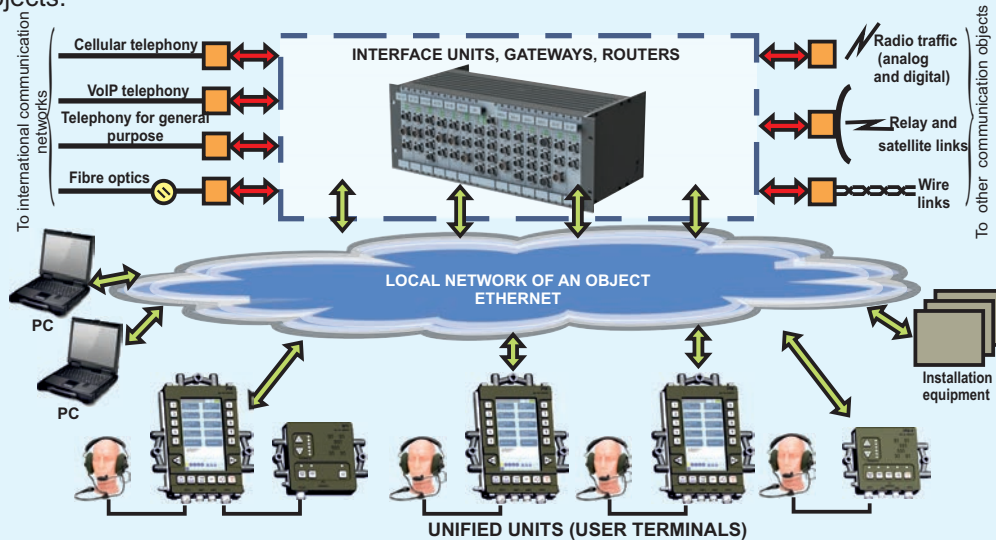




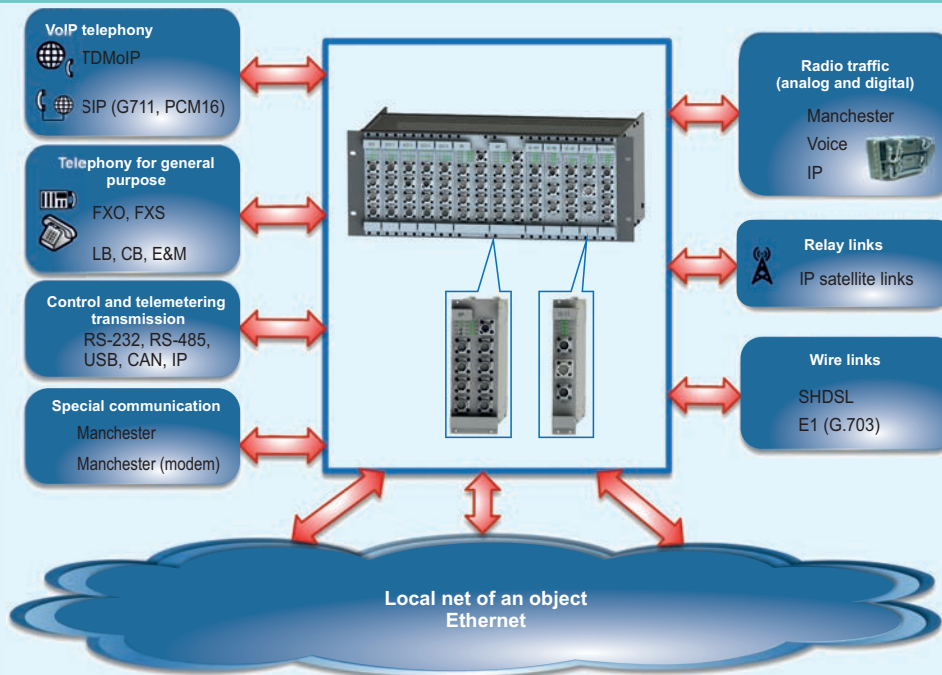
TYPICAL CIRCUITS OF THE COMPLEX

PURPOSE

The R-188 «UKUS» product is intended to provide communication services to officials and crews of various movable objects.



VERSION OF R-188 PRODUCT IN EUROCARD 19" DESIGN



PURPOSE:

Multiservice networking, interfacing of the advanced and actual nets and channels, user access to the wide range of telecommunication services.

APPLICATION:

VoIP gateway, router, multiplexor, media converter, intercommunication equipment for control and interfacing.



FUNCTIONALITY AND PERFORMANCE OF THE SYSTEM



BASIC FUNCTIONAL CAPABILITIES

- 1) Inner voice , conference and selective calls of the subscribers of a communication object.
- 2) Voice selective and conference calls via digital communication channeling through channel equipment and radio means of an object.
- 3) Voice calls via existing analog radio means or wire lines.
- 4) Text-message transmission.
- 5) Transmission of video, sound, navigation and other data with an object equipment.
- 6) Calls and communication channels management.
- 7) Management of available radio means and equipment.
- 8) Non Ethernet Data transmission and commutation (voice, telephony, RS-232, RS-485, Manchester, CAN and others).
- 9) Other functions are available in accordance with the customer's requirements.

BASIC FEATURES OF THE COMPLEX

- 1) The «UKUS» complex is at home in stationary objects, as well as in vehicles on wheel or track chassis.
- 2) «UKUS» operates in the modern digital multi-service communication networks with existing and perspective means of transmission and channeling.
- 3) «UKUS» supports all existing analog communication equipment.
- 4) «UKUS» can be software configured to meet any tasks and functions of official persons.
- 5) «UKUS» provides simultaneous operation in several digital and analog communication net.
- 6) Provides real-time displaying of communication channels, equipment and subscriber's state.
- 7) «UKUS» provides remote operation at the distance up to 500m with full operability maintenance.
- 8) «UKUS» has high level of scalability.

BASIC SPECIFICATIONS

- 1) The complex provides power transmission via Ethernet (Power over Ethernet (PoE)) IEEE 802.3af-2003 and IEEE 802.3at-2009.
- 2) The complex provides switching of the chosen units to the following interfaces:
 - Manchester with the transmission rate of 1.2; 2.4; 4.8; 9.6 and 16 kbps;
 - PC (VF, PTT switch, call);
 - RS-232 with the transmission rate of 1.2; 2.4; 4.8; 9.6; 14.4; 19.2; 28.8; 38.4; 57.6; 76.8 and 115.2 kbps;
 - RS-485 with the transmission rate of 1.2; 2.4; 4.8; 9.6; 14.4; 19.2; 28.8; 38.4; 57.6; 76.8 and 115.2 kbps;
 - USB high speed;
 - double-wire for the voice terminals in the local battery mode;
 - four-wire VF with the signaling system of the 5th type;
 - data path of the E1 flow;
 - multimode fibre-optic line with the wavelength of 1310 nm, FC/UPS MM jack, 100 Mbps rate and range up to 2 km;
 - single-mode fibre-optic line with the wavelength of 1310 nm, FC/UPS MM jack, 100 Mbps rate and range up to 20 km;
- 3) Operating supply voltage, V, +27 (+10%; -18%);
- 4) Operating temperature range from minus 50 up to + 55°C;
Limiting temperature range from minus 60 up to + 70°C.





COMPLEX CONFIGURATION

UNIFIED COMMANDER CONTROL UNIT (CCU)



PURPOSE:

Full-range user terminal with software configured interface.

The unit provides all the features of internal and external communication as well as communication network control for user and operator.

FEATURES:

- 1) Simple user-friendly interface (no special skills and long-term training are required).
- 2) Interface customizing.
- 3) Ability of simultaneous operation in several digital and analog networks.
- 4) 1-3 keystrokes for functions call.
- 5) Convenient displaying of internal and external user directories with 1keystroke access to any of them.
- 6) Providing of all communication modes (voice conference, conference, text messages, voice mail).
- 7) Adaptive design for operation in stationary and movable objects.
- 8) Backlit of active keys for operation in darkness.
- 9) Ability of two headsets connection
- 10) Inbuilt Ethernet switch.

UNIFIED CREW MEMBER TERMINAL UNIT (CMTU-1, CMTU-2)



PURPOSE:

Simplified user terminal.

The unit provides all the features of internal and external communication for a vehicle crew and base functions of the vehicle equipment management.

FEATURES:

- 1) Possibility of simultaneous operation in three networks (or on three channels).
- 2) Protection against accidental keystroke.
- 3) LED indication and backlit of active keys.
- 4) Integrated speaker phone (in the CMTU-2).
- 5) Adaptive design for operation in stationary and movable objects.
- 6) Two headsets connection.
- 7) Inbuilt Ethernet switch.



COMPLEX CONFIGURATION



VOICE TERMINAL UNIT (VTU)



PURPOSE:

The unit VTU provides crew members access to handsfree function.

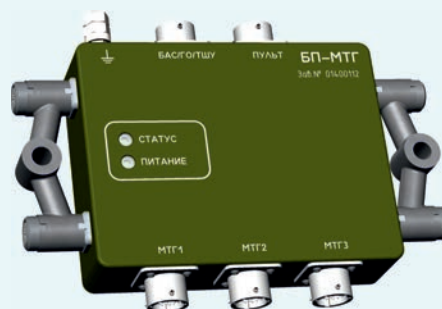
INTERFACES:

- 1) Voice + signal lines for connection to - 1 pc.

FEATURES:

- 1) Loud, high-quality sound at small size of the unit.
- 2) Control capability with the use of remote control panel and control panel of the unit.
- 3) Protection against accidental keystroke.
- 4) LED indication and backlit of active keys.
- 5) Adaptive design for operation in stationary and movable objects.

HANDSET CONNECTION UNIT (HCU)



PURPOSE:

HCU provides connection to CCU and CMTU of up to 3 handsets and alarm device signals on one channel of the handset connection unit.

INTERFACES:

- 1) Voice + signal lines for connection to the panel - 1 pc.
- 2) Voice + signal lines + power supply for handsets or voice terminal unit - 1 pc.
- 3) Voice + signal lines for switching connection of alarm device - 1 pc.

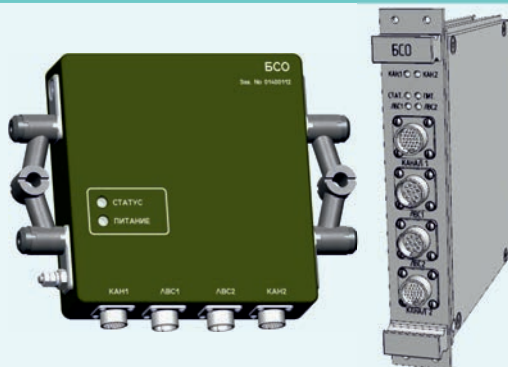
FEATURES:

- 1) Protection of short circuit and power overload in each channel.
- 2) Adaptive design for operation in stationary and movable objects.





UNIT FOR INTERFACING WITH OLD EQUIPMENT (OECU)



PURPOSE:

The unit provides connection of object equipment to internal digital network of the complex for transmission of voice and data and also settings and controls of this equipment (radio sets, terminals, data transmission equipment, etc.).

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.
- 2) RS-232 - 2 pcs.
- 3) RS-485 - 4 pcs.
- 4) Manchester - 2 pcs.
- 5) Voice - 2 pcs.

- 6) USB - 1 pc.
- 7) Voice/Manchester with the protocol ACCORD-SS-PD/PS - 8 pcs.
- 8) RS-422 - 4 pcs. for OUCU, version 5.
- 9) VF-30 - 2 pcs. for OECU, version 6.

FEATURES:

- 1) Program option: the IP router of packages + modems for transmission of IP packets on Manchester channels through wire links or RS with the rate of 16 kbps.
- 2) Set of operating modes, including recorder and annunciator.
- 3) Inbuilt Ethernet switch.
- 4) Adaptive design for operation in stationary and movable objects.
- 5) Galvanic isolation for all interfaces.
- 6) Unit and crate (4U, 6 HP) versions.

UNIT OF INTERFACING WITH PHYSICAL LINES (PLCU)



PURPOSE:

Provides connection of an object equipment via Manchester interface to inner digital «UKUS» network for management of voice and data transmission.

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.
- 2) Manchester - 4 pcs.

FEATURES:

- 1) Program option: the IP router of packages + modems for transmission of IP packets on Manchester channels through wire links or RS with the rate of 16 kbps.
- 2) Inbuilt Ethernet switch.
- 3) Adaptive design for operation in stationary and movable objects.
- 4) Galvanic separation of all interfaces.
- 5) Unit and crate (4U, 6HP) versions.



COMPLEX CONFIGURATION



TELEMETRY UNIT (TU)

**PURPOSE:**

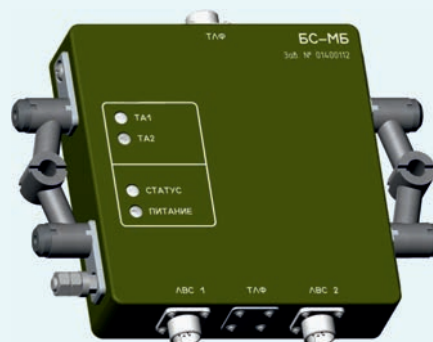
The telemetry unit provides interfacing of sensors, meters, process hardware and other inner subsystems with the digital network of R-188 «UKUS».

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.
- 2) RS-232 - 2 pcs.
- 3) RS-485 - 4 pcs.
- 4) CAN - 1 pc.
- 5) Voice - 2 pcs.
- 6) USB-HOST - 4 pcs.
- 7) Wireless 2.4 GHz - 2 pcs.

FEATURES:

- 1) Capability of wireless short-range networking for voice and data transmission.
- 2) Built-in Ethernet switch.
- 3) Adaptive design for operation in stationary and movable objects.
- 4) Galvanic separation of all interfaces.
- 5) Modular and crate (4U, 6HP) versions.

UNIT FOR CONNECTIVITY WITH VOICE TERMINAL
IN LOCAL BATTERY MODE (LBCU)**PURPOSE:**

The unit provides connection of voice terminals of TA-88 type in LB mode to inner digital «UKUS» network for management of voice transmission and signal of press-to-talk button for the radio set control.

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.
- 2) Voice terminals - 2 pcs.

FEATURES:

- 1) Inductor call and transmission of PTT signal.
- 2) Inbuilt Ethernet switch.
- 3) Adaptive design for operation in stationary and movable objects.
- 4) Galvanic separation of all interfaces.
- 5) Unit and crate (4U, 6HP) versions.





UNIT FOR CONNECTION WITH VF E/M LINES (E&M CU)



PURPOSE:

The unit provides connection of analog channels of E&M Type V interface of an object to the inner digital «UKUS» network for management of voice and data transmission.

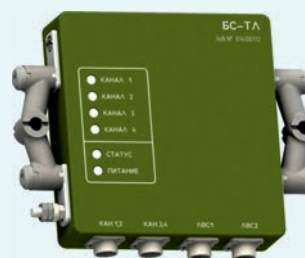
INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.
- 2) Four-wire VF E&M Type V - 4 pcs.

FEATURES:

- 1) Adaptive design for operation in stationary and movable objects.
- 2) Inbuilt Ethernet switch.
- 3) Four-wire VF interface with Type V signaling according to ANSI T 1.409.
- 4) Unit and crate (4U, 6HP) versions.

UNIT FOR CONNECTION WITH TELEPHONE LINES (TLCU)



PURPOSE:

The unit provides connection of analog telephone lines to digital networks of «UKUS» for voice communication management.

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.
- 2) Two-wire FXO/FXS or two/four-wire LB/CB - 4 pcs.

FEATURES:

- 1) Preset program (of telephone interface type)
- 2) Duplex communication with echo suppression.
- 3) Adaptive design for operation in stationary and movable objects.
- 4) Inbuilt Ethernet switch.
- 5) Galvanic separation of all interfaces.
- 6) Unit and crate (4U, 6HP) versions.



COMPLEX CONFIGURATION



UNIT FOR CONNECTION WITH TELEPHONE LINES 1 (TLCU1)

**PURPOSE:**

The unit provides connection of telephone lines from MTCCC via ten-wire joint of the digital network of «UKUS».

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.
- 2) Manchester/ten-wire joint - 4 pcs.

FEATURES:

- 1) Preset program (of interface type)
- 2) Adaptive design for operation in stationary and movable objects.
- 3) Inbuilt Ethernet switch.
- 4) Galvanic separation of all interfaces.
- 5) Unit and crate (4U, 6HP) versions.

UNIT FOR CONNECTION WITH TELEPHONE LINES (TLCU2)

**PURPOSE:**

The unit provides connection of FXS telephone equipment to the digital network of «UKUS».

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.
- 2) Two-wire FXS - 8 pcs.

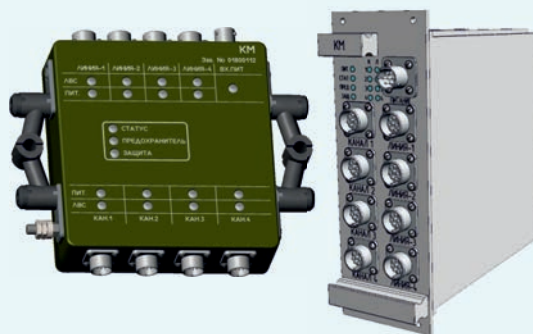
FEATURES:

- 1) Preset program (of telephone interface type).
- 2) Duplex communication with echo suppression.
- 2) Adaptive design for operation in stationary and movable objects.
- 3) Inbuilt Ethernet switch.
- 4) Galvanic separation of all interfaces.
- 5) Unit and crate (4U, 6HP) versions.





GATEWAY ROUTER UNIT (GRU)



PURPOSE:

The unit is a gateway for connection to an external IP-network

It provides:

- switching of Ethernet packages for internal information network;
- IP packages routing between internal and external networks;
- dynamic routing of voice, messages and control commands between communicating objects;
- mains power distribution to the hardware peripherals.

INTERFACES:

Ethernet 10/100 BASE-T/TX + power supply 4+4 pcs.

FEATURES:

- 1) Output traffic optimization.
- 2) Active protection against mains surge (up to 100V).
- 3) Protection against short circuit and overload in each channel.
- 4) Ability to divide switch network into several independent segments.
- 5) Detailed LED indication.
- 6) Adaptive design for operation in stationary and movable objects.
- 7) Unit and crate (4U, 12 HP) versions.

UNIT FOR CONNECTION SIP TELEPHONY (SIPCU)



PURPOSE:

The unit provides interfacing of digital "UKUS" network with networks of SIP telephony for management of voice transmission. It also works as protocol UKUS <=> PC gateway.

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.

FEATURES:

- 1) Support of various voice codecs: G711, G712, G723, G729 and others.
- 2) Support of all SIP automatic telephone stations including commercial providers.
- 3) Up to ten simultaneous connections/ conversations.
- 4) Adaptive design for operation at stop and in motion.
- 5) Inbuilt Ethernet switch.
- 6) Unit and crate (4U, 6HP) versions.



COMPLEX CONFIGURATION



UNIT FOR CONNECTION WITH E1 LINES (E1CU)



PURPOSE:

The unit provides connection of E1 lines of an object with the inner digital «UKUS» network for management of voice & data transmission.

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.
- 2) E1(ITU-T G.703, G.704) - 2 pcs.

FEATURES:

- 1) Two modes:
 - router (IP over E1);
 - EDSS<=>SIP trunk gateway.
- 2) Inbuilt Ethernet switch.
- 3) Adaptive design for operation at stop and in motion.
- 4) Unit and crate (4U, 6HP) versions.

DISTANT WORKPLACE CONNECTION UNITS (DWCU-A, DWCU-B)



PURPOSE:

The units provide arrangement of digital channel via one 2-wire cable of P-274 type with the rate of 15 Mbit/s. They are intended for management of distant workplaces or communication lines between objects.

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX - 2 pcs.
- 2) SHDSL + phantom power - 1 pcs.

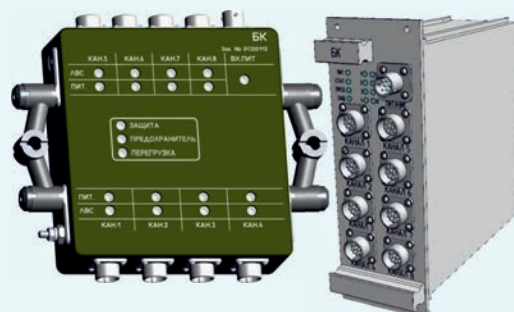
FEATURES:

- 1) Router/Ethernet bridge operation modes.
- 2) Remote power remote unit and one commander's console via communication line (up to 200 m on P-274 wire).
- 3) Automatic selection of local or remote power source.
- 4) Control of break and short circuit.
- 5) Detail LED indication for quick trouble-shooting.
- 6) Inbuilt Ethernet switch.
- 7) Adaptive design for operation in stationary and movable objects.
- 8) Unit and crate (4U, 6HP) versions.





SWITCHING UNIT (SU)



PURPOSE:

The unit provides switching of Ethernet packets for internal information network and also distribution of board supply on connected equipment.

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX + power supply - 8 pcs.

FEATURES:

- 1) Active protection against voltage surge in board mains (up to 100V).
- 2) Protection against short circuit and overload in each channel.
- 3) Ability to divide switch network into several independent segments.
- 4) Detailed LED indication.
- 5) Adaptive design for operation in stationary and movable objects.
- 6) Unit and crate (4U, 12 HP) versions.

UNITS FOR SWITCHING TO CRYPTOGRAPHIC HARDWARE (CH-CU, CH-IU)



PURPOSE:

The units are intended for interfacing with cryptographic hardware and physical subscribers switching to open and secured networks of an object.

INTERFACES:

- 1) Ethernet 10/100 BASE-T/TX – 2 pcs.
- 2) Voice – 3 pcs.
- 3) RS - 232 – 1 pcs.

FEATURES:

- 1) Operation modes: router/Ethernet bridge.
- 2) Inbuilt Ethernet switch.
- 3) Adaptive design for operation in movable objects.
- 4) Unit design.



COMPLEX CONFIGURATION



UNIT FOR INTERFACING WITH THE "ANGSTREM-V" RADIO SET (AR-CU)

**PURPOSE:**

The unit provides connection of digital radio sets of an object "(the 6th generation) to inner digital network of «UKUS» for management of voice & data transmission and also for tuning and control of these stations. It also works as protocol UKUS <=> PC gateway.

The AR-CU unit is a component of the R-188 «UKUS» unified intercommunication and control system S and performs the functions of a log gateway (a gateway of logs compilation) between the control panels and units of the «UKUS» customer premises network and R-187B «Angstrem-V» radio set. The unit allows to carry out full-function interface to R-187B radio set on all types of communication services, the transmitted traffic and control:

- voice communication in simplex and duplex modes via the radio network of direct communication;
- selective and conference telephone calls via radio access network (including MESH network) with external subscribers, including subscribers with portable R-187P1 stations;
- work in the mode of compatibility with the radio sets of previous generations (R-168);
- text messages transmitting;
- data transmission from APD (Manchester interface);
- voice mail;
- satellite navigation and navigation data exchange ;
- reception and a conclusion through the CCU of system time;
- operational management of radio station through the CCU.

INTERFACES:

- | | |
|---------------------------------------|--------------------|
| 1) Ethernet 10/100 BASE-T/TX - 2 pcs. | 3) RS-485 - 2 pcs. |
| 2) Manchester - 2 pcs. | 4) RS-232 - 2 pcs. |

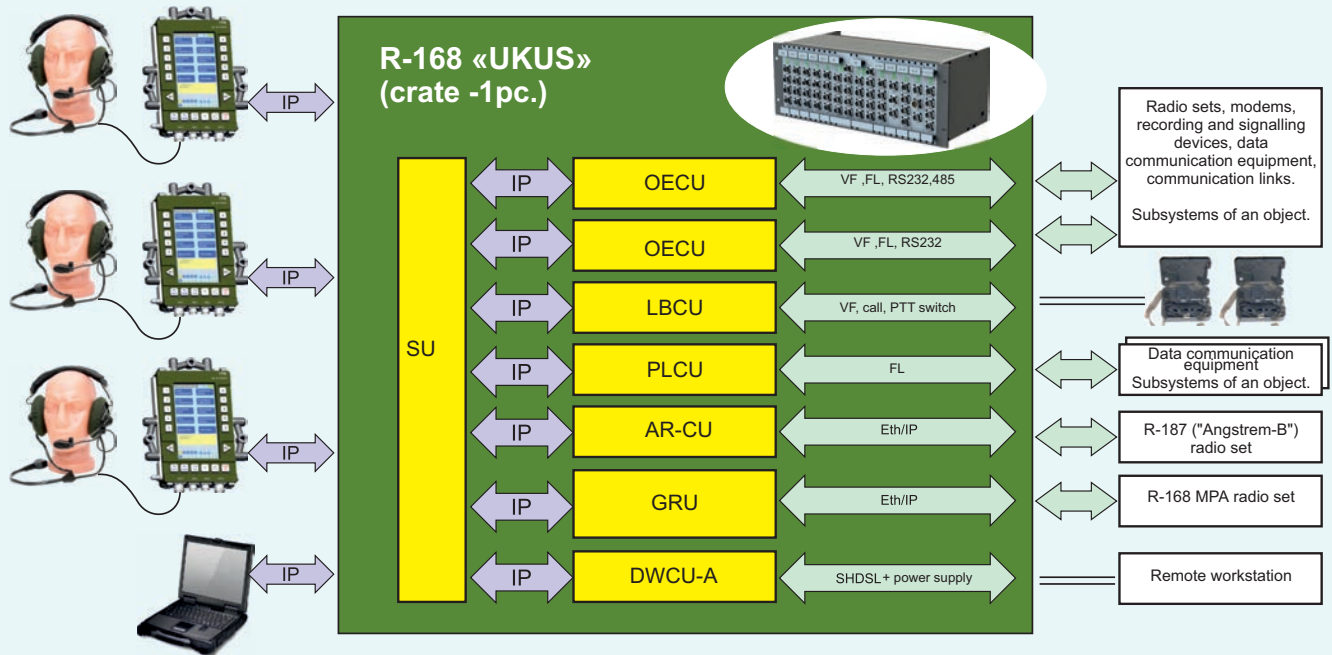
FEATURES:

- 1) Support of various voice codecs: MELP1200, MELP2400, ACELP, PCM-16, G711 and others
- 2) Support of SNMP, SSH, SFTP and other manager protocol.
- 3) Up to ten simultaneous connections/ conversations/
- 4) Adaptive design for operation in stationary and movable objects.
- 5) Inbuilt Ethernet switch.
- 6) Galvanic separation of all interfaces.
- 7) Unit and crate (4U, 6HP) versions.

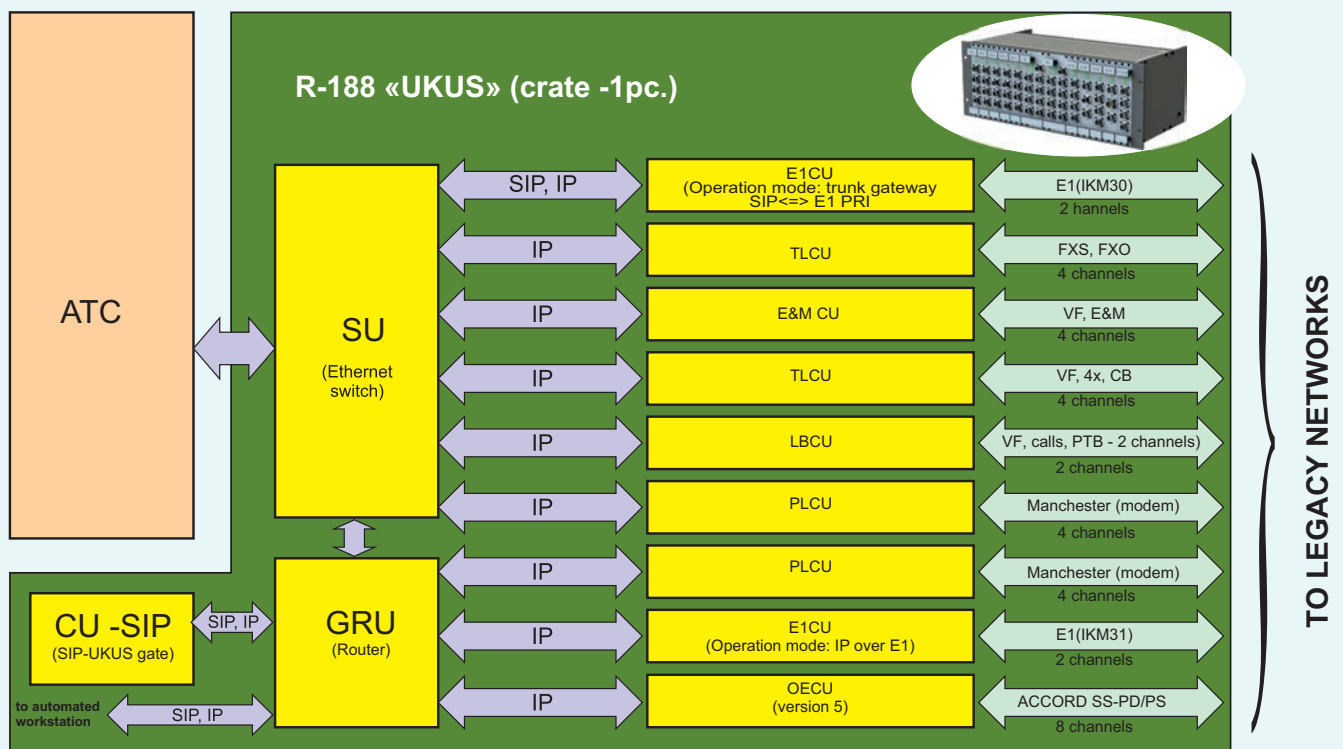




BLOCK DIAGRAMM for automatic control and communication complex of mobile communication systems and command vehicles (example)



BLOCK DIAGRAM of gateway for legacy networks



КОНТАКТЫ

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