DMR Standard Radio Means of Communication

IRZ TELECOM

About Company

IRZ TELECOM

IRZ-Telecom

IRZ Telecom is a research and production company which develops, manufactures and supplies modern telecommunication equipment.

Technological Radio Communication

Mobile Coverage Solutions

Sensors: Radars, Lidars, Cameras

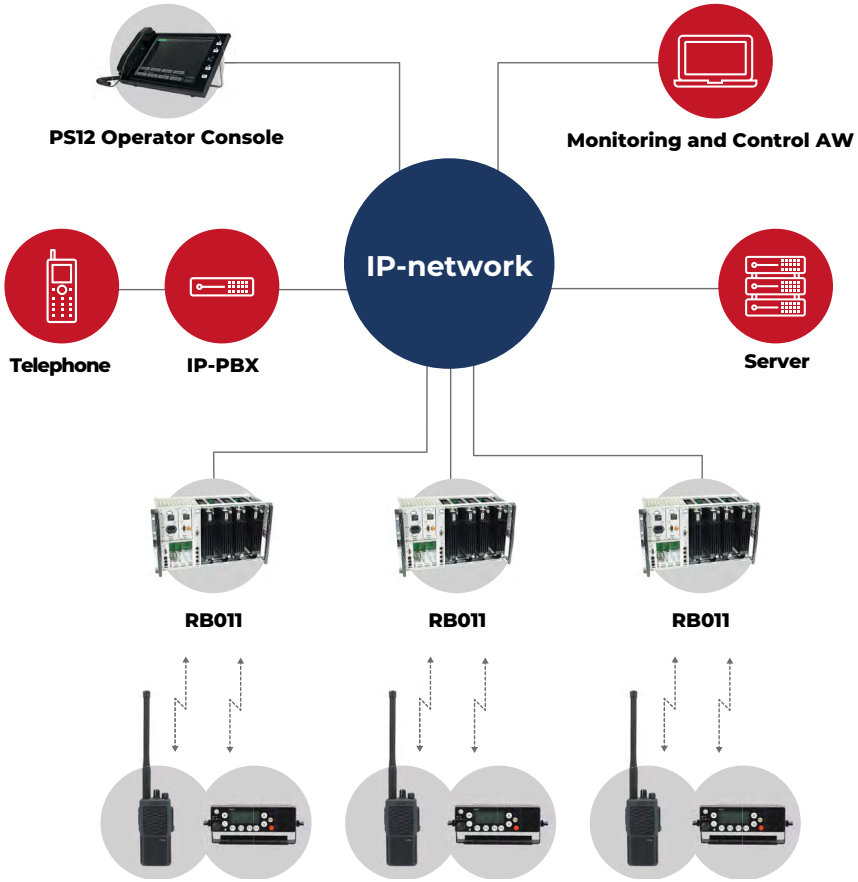
Mobile Radio System of DMR Standard

Types of Equipment

- Portable Radios
- Mobile Radios
- Base Radios
- Operator Consoles

Key Benefits

- Hardware and software are designed and produced in Russia
- No built-in operating systems or open software
- Analog and digital radio network operation
- Compatibility with similar products of other vendors
- Free technical support of the customer during the whole period of the equipment operation
- Free regular software update, possibility of customization



Functionality

01
Group, individual and circular voice calls

02
Location determinatioin

03
Remote listening of subscriber's radios

04
Creation of dynamic gruops of users

05
Communications recording

06
Network monitoring

07
Communication with PABX subscribers

08
Building a flexible Mobile Radio System via the IP network

RN311M

DMR Standard Portable Radio

Description

RN311M portable radio is an easy-to-use communication tool for everyday use.

Function

It provides analog and digital radio network operation in DMR standard. The main parameters correspond to GOST 12252 and GOST R 56172.

Additional Functionality

- Location determination by GLONASS/GPS signals
- Communications recording to the internal non-volatile memory, The ability to listen to recordings using special RegPlayer software
- «ManDown» function

Programmimg of the radio is performed by RN311M USB programming kits

Product Appearance, Control Layout and Light Indication

1 —Antenna VHF136-174 MHz, GPS

2 — Switcher of Working Channel Number

3 — On/Off Switch of the Radio Collocated with the Volume Control

4 — On/Off Button of the Emergency Calls Mode

5 — Microphone

6 — Loudspeaker

7 — Push-To-Talk Switch for the «Transfer» Mode

8 — Function Key 1

9 — Function Key 2

10 — Battery Lock

11 — System Connector Cover

12 — Rechargeable Battery

13 — Operating Mode Indicator

RN311M Technical Characteristics

Parameter	PH311M	
	Analog	Digital
Frequency Range	136.0–174.0 MHz	
Number of Channels	16	
Transmitter Power	0,7/1,75/5 W	
Receiver Sensitivity	not worse than 0.26 μV	
Modulation Types	FM (16K8F class of emission)	4FSK (11K8F class of emission)
Frequency Spacing	25/12.5 kHz	12.5 kHz
Radiolink Protocol	ETSI TS 102 361, Tier II	
Vocoder	AMBE2+	
ADC	24 bits	
Noise Reducer	yes	
Glonass/GPS Receiver		yes, accelerated determination
«ManDown» Function		yes
Built-in Communications Recorder		yes
Emergency Call Button		yes
Battery	2800 mA/h	
Headset Connector	universal	
Casing	IP65	
Dimensions	115x62x38 mm	
Weight	0.4 kg	
Operating Temperature Rate	-25...+50 °C	

Basic Delivery Set

The radio is supplied together with the transmitter, antenna, battery charger, battery, clip, product certificate, operation manual

1. RN311M Transmitter

2. Programming Cable

RN311M programming cable with the USB connector to connect to the computer

3. Antenna

VHF/GPS helical antenna

4. Battery

Rechargeable battery Li-Ion 2800 mAh; 7.2 V

5. Clip

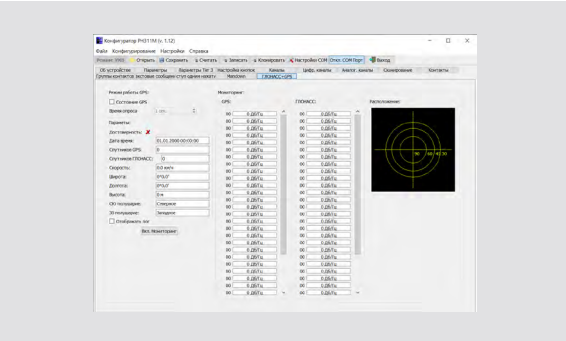
The clip is provided for radio fixing on clothes or on the belt

6. Charger

Desktop single-seater charger for RN311M together with AC 220V power adaptor

7. Configurator and RegPlayer Software for Radio Programming and Control

It is used for configuring channels and services



Options

1. Manipulator (Tangent)

Speaker, microphone, tangent

2. Holster for the Portable Radio

Holster with a loop for fixing to the belt together with a shoulder nylon strap with two snap hooks

3. Headset

Headset with in-ear headphones together with a device for attachment behind the ear and PTT button

4. Headset for the Concealed Carry

Headset for the concealed carry with a transparent air duct, microphone and PTT button

5. Car Power Adaptor

Car power adaptor for the charger is to be connected to the DC 12V cigarette lighter

6. Adaptor for External Headsets

Adaptor for RN311M radio for connection to external headsets via 2pin or Mini Jack connectors

7. Multi-Seat Charger

Desktop charger for 6 seats and indepndent charging of each battery. The charger is to be connected to the network of 220 V and has a power cable.

RM211

DMR Standard Mobile Radio

Description

RM211 radio is a compact radio for everyday usage on means of transport and as a stationary radio.

Function

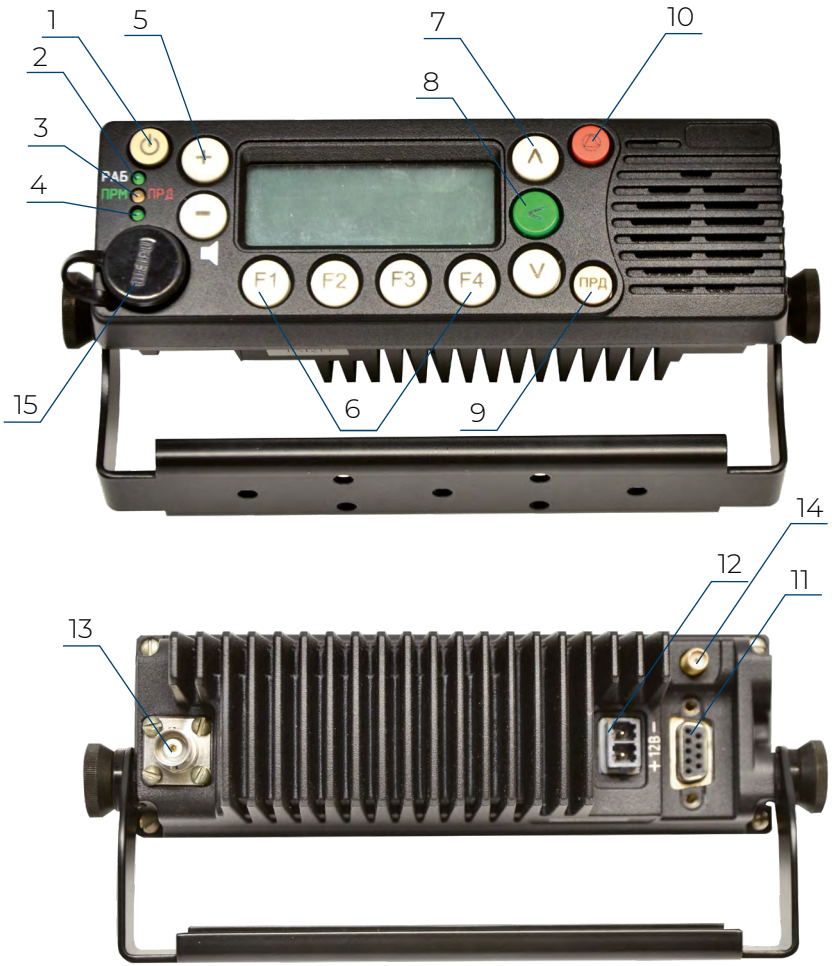
It provides operation in analog and digital networks in DMR standard. The main parameters correspond to GOST 12252 and GOST R 56172.

Additional Functionality

- Location determination by GLONASS/GPS signals. Compatibility with RB011 base radios in GLONASS/GPS signal transmission
- Communications recording to the internal non-volatile memory, The ability to listen to recordings using special RegPlayer software.

Programmimg of the radio is performed by RM211 USB programming kits

Product Appearance, Control Layout, Light Indication and Connectors



1 — On/Off Switch of the Radio and Calling the Menu
2 — On/Off State Indicator
3 — Receiving/Transmission Mode Indicator
4 — IP Network Indicator (activated in the stationary version of the radio only)
5 — Volume Level Control of the Internal and External Speaker
6 — F1...F4 — Function Keys:
- F1 in analog mode controls the Noise-reducer.
Short press - to open/close the Noise-reducer.
More than 1 sec. press - to control the level of the Noise-reducer by pointer keys, located on the right from the LCD indicator
- F2...F4 keys the following functions can be programmed:
- to send a tone call for the analog mode;
- individual or a group call for the digital mode.

7 — Noise-reducer Level Setting or Channel Switching — According to the Initialized Function
8 — Enter-like Key
9 — Turning On the Transfer Mode Using the Emergency Microphone on the Front Panel of the Radio
10 — Emergency Button
11 — RS232 System Connector for Connection to the Programmer or the External Speaker
12 — 12 V Power
13 — Antenna Connector
14 — GLONASS/GPS Antenna Connector
15 — Manipulator (Tangent) Connector

Technical Characteristics

Parameter	Value	
	Analog	Digital
Frequency Range	136.0-174.0 MHz	
Number of Channels	99	
Transmitter Power:		
– minimal	1.0±0.5 W	1.0±0.5 W
– low	5.0±0.7 W	5.0±0.7 W
– nominal	9±1 W	9±1 W
– high	25±4 W	25±4 W
Receiver Sensitivity	not worse than 0.5	not worse than 0.5
Modulation Types	FM (16K8F class of emission)	4FSK (11K8F class of emission)
Frequency Spacing	25/12.5 kHz	12.5 kHz
Radiolink Protocol		ETSI TS 102 361, TierII, TierIII
Vocoder		AMBE2+
Noise Reducer	yes	
GLONASS/GPS Receiver		yes
Built-in Communications Recorder		yes
Built-in Loudspeaker (max. power of sound signals is not more than 0.5 W)	yes	
Button of the Built-in Additional Microphone on the Front Panel of the Radio for Communications Performed without the Remote Manipulator	yes	
Emergency Call Button	yes	
Supply Voltage	12 V	
Wrong Polarity Protection	yes	
Dimensions	175x56x85 mm	
Weight	0.7 kg	
Operating temperature range	- 25...+50 ^{0}C	

Delivery Set

The delivery set includes the transmitter, installation kit, product certificate and operation manual.

Options

1. Manipulator

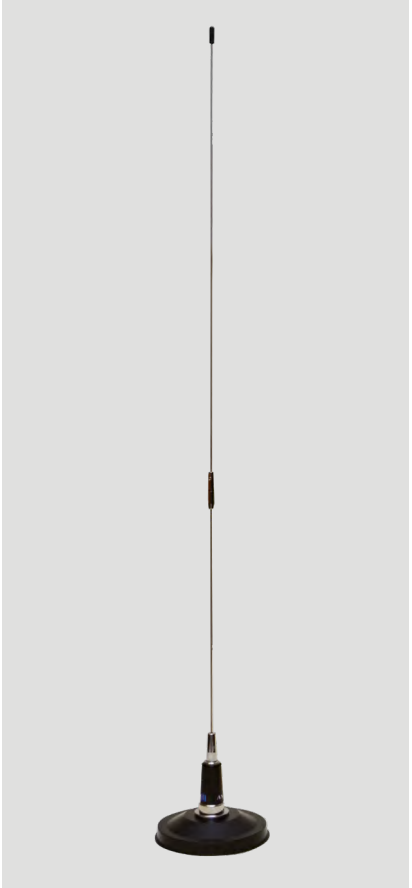
Speaker, Microphone, Tangent

2. Loudspeaker

6 W Power

3. Antenna

Magnetic-based whip antenna for the mobile radio (BNC connector)



4. Programming Cable

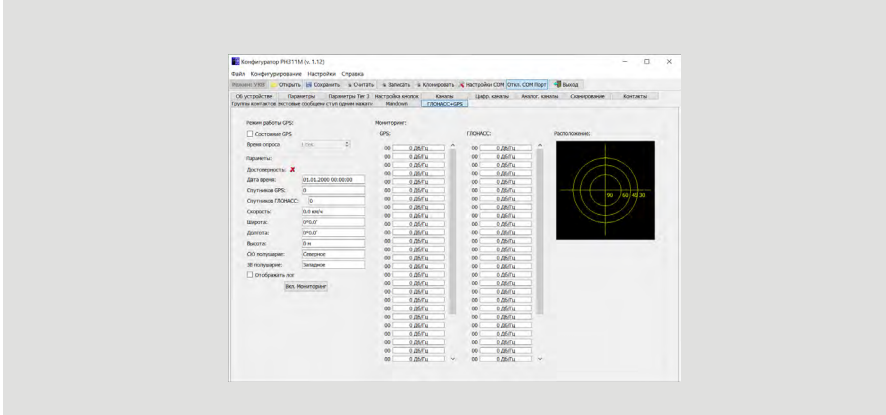
5. Voltage converter

Car Power Converter 24/12 V

6. Power Supply

220/12 V Power Supply for the RM211 Stationary Radio

7. Configurator and RegPlayer Software for the Radio Programming and Control



RN311M-15 Repeater Radio

Description

It is designed for organizing the DMR mobile radio communication in cable radio communication system units

Key Benefits

- The repeater provides the operation by the digital line channel organized on the basis of IP networks and Ethernet-interface. The following equipment can be connected via Ethernet-interface:
  - operator console for communications with the network subscribers
  - equipment for the data transmission to the network subscribers
  - means of network monitoring and administration
- Remote control of the repeater's transmitter
- Possibility of the quick return to factory network settings

Technical Characteristics

Parameter	Value
Frequency Range	136.0...174.0 MHz
Transmitter Power	Nominal 2 W
Receiver Sensitivity	not worse than 0.26 μV
Modulation Types	FM/4FSK
Frequency Spacing	25/12.5 kHz
Radiolink Protocol	ETSI TS 102 361, Tier2, Tier3
Vocoder	AMBER2+
Power Supply	From REG-F Module with 8 V Voltage
Operating Temperature Range	-25...+50 ^{0}C

RB011

Base Radio/ DMR Standard Repeater

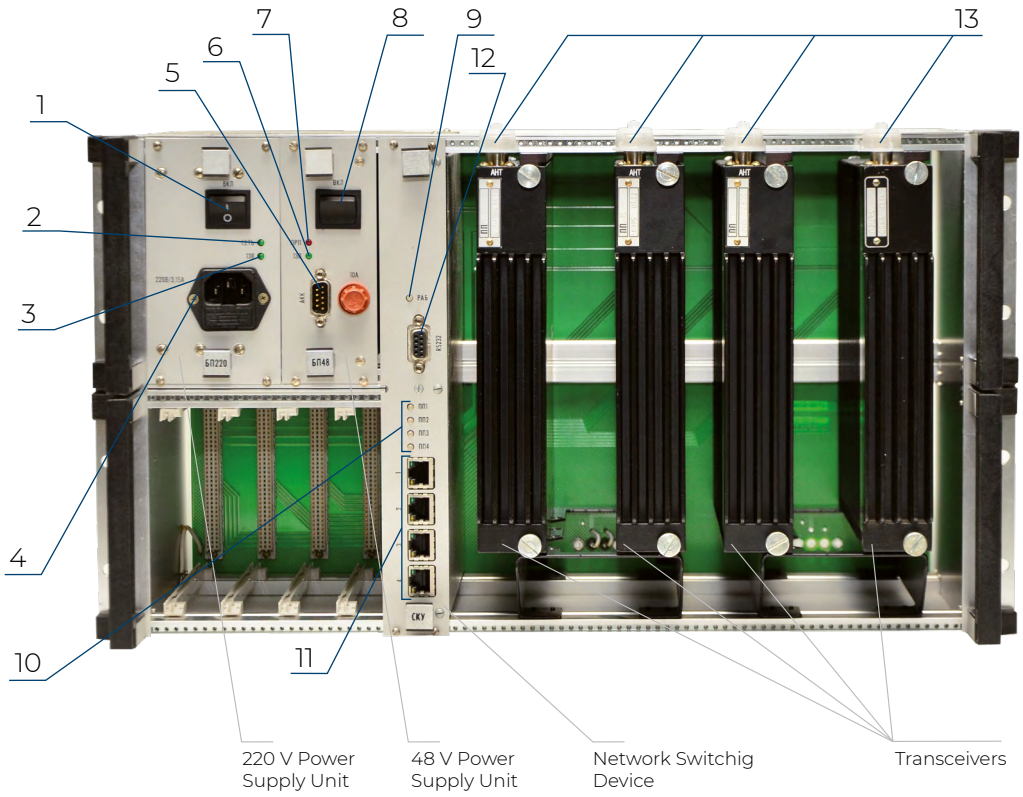
Description

The radio is designed for the operation as a base radio/ repeater in analog and digital radio communication of DMR standard. The main parameters correspond to GOST 12252, GOST R 56172.

It provides the retransmission of channels, connection via IP network and allows to control remotely the operability and parameters' changing of the network due to special R-ARM2 software or via SNMP. It can also record communcations to the internal nonvolatile memory.

Configuration and monitoring are provided by the R-ARM2 software

Product Appearance, Control Layout and Light Indication



The repeater provides the following functions:

- Network subscribers registration
- Organizing voice connections between the subscribers
- Communications recording to the inrternal nonvolatile memory
- Retransmission of the received signals
- Monitoring and administration of parameters and operation modes via SNMP-protocol
- Switching to a back-up power

1 — On/Off switch of 220 V Power Supply
2 — 220 V Power Supply Existence Indicator
3 — 220 V Power-On Indicator
4 — 220 V Power Supply Connector
5 — 48 V Power Supply Connector (DB9)
6 — 48 V Power-On Indicator
7 — 48 V Power Error Indicator
8 — On/Off switch of 48 V Power Supply
9 — Radio Operation Indicator:
- Normal Operation
- Error

10 — Indicator of Receiving/Transmitting of the Signal of the Transceiver:
- Transceiver's Error
- Receiving
- Transmitting

11 — IP-Network Connection (Ethernet RJ45), 4 pcs.
12 — RS232 Service Connector
13 — N-Type Connector for the Feeder Connection

Technical Characteristics

Parameter	Value	
	Analog	Digital
Frequency Range	136.0–174.0 mHz	
Transmitter power		
– minimal	1.8±0.5 W	1.8±0.5 W
– low 2		5.0±1.5 W
– low 1		10±1.5 W
– nominal	9±1 W	25±4 W
– high	25±4 W	40±6 W
Receiver Sensitivity	0.5 µV	0.5 µV
Modulation Types	FM (16K8F class of emission)	4FSK (11K8F class of emission)
Frequency Spacing	25 / 12.5 kHz	12.5 kHz
Radiolink Protocol		ETSI TS 102 361, TierII
Vocoder		AMBE2+
Network Interface	Ethernet	
Network Protocol	SIP, RTP	
Monitoring and Administration Protocol	SNMP	
Built-in Communications Recorder		yes
Supply Voltage:		
– main power supply	AC 220 V	
– back-up supply	DC 48 V	
Power Consumption	≤ 250 W	
Wrong Polarity Protection	yes	
Dimensions	483 x 281 x 270 mm	
Weight	≤ 13.3 kg	
Operating Temperature Range	+5…+40 ^{0}C	

Delivery Set

The delivery set includes a 19'' rack with a backplane, 220 V power supply main unit and/or 48 V back-up unit, transceivers, network switching device and R-ARM2 software.

Options

- Antenna-feeder device set for the base radio includes the antenna type, feeder length and additional equipment
- Antenna-feeder device interoperability set includes: a duplex filter, combiner, distribution panel
- Additional equipment of the base radio includes: a 19'' rack, ventilators unit, input unit, battery, cables and mounting parts kit
- Automatic work place (AW) of the administrator of the DMR network includes: a personal computer/ or laptop, monitor, keyboard, mouse and the installed software Configurator, R-ARM2

Configuration Options of RB011 Repeater

Parameter	RB011 Implementation Option					
	-00	-01	-02	-03	-04	-05
19'' rack	1	1	1	1	1	1
Backplane	1	1	1	1	1	1
BP220 Power Suppply Unit	1	-	1	1	-	1
BP48 Power Suppply Unit	-	1	1	-	1	1
Network Switching Board	1	1	1	1	1	1
P2CS Transceiver	2	2	2	4	4	4
R-ARM2 Software	1	1	1	1	1	1

PS12

Dispatcher's Console

The dispatcher's console is designed for organizing connections and managing voice conversations between operators in analog and digital radio networks of the DMR standard produced by IRZ.

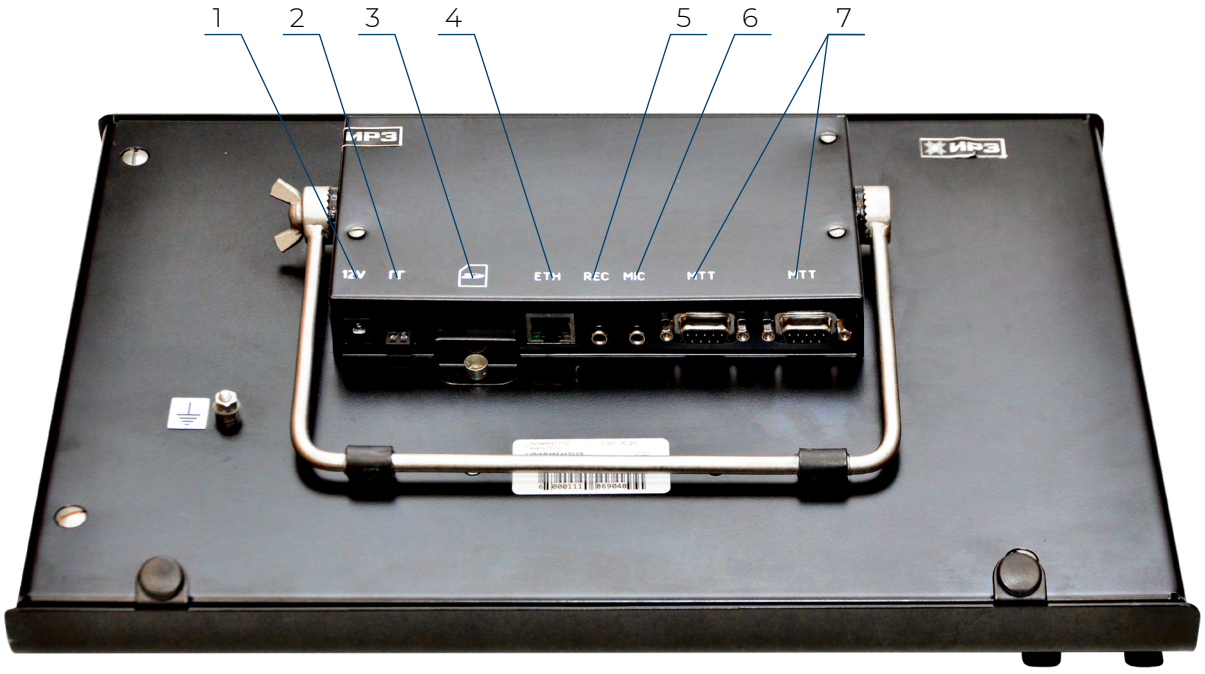
Function:

- Configuring and monitoring the status of network elements
- Interception of communications
- Individual or group call set-up
- Circular call with all radio network subscribers
- Address book administation
- Subscribers' groups establishment
- Communications recording to the internal or external recorder
- Determination of the location of radio subscribers via internal IRZ protocol
- Connection to IP-PBX via SIP
- Connection establishment between radio network subscribers and IP-PBX subscribers
- Additional external loudspeaker connection

Technical Characteristics

Parameter	Value
Interface Type	Ethernet 10/100BASE-T
Management Type	Sensory (Touch screen)
Screen size	12''
Protocols:	
- connection management	SIP
- transmission of speech	RTP
- monitoring	SNMP
Power Supply	AC 220 V
Dimensions	365x242x67 mm
Operating Temeperature Range	+5...+40 ^{0}C

Product Appearance



1 — Connection to 12 V Connector of 220/12 V Power Supply Unit
2 — Connection to the Additional Loudspeaker
3 — SD Memory Card Slot
4 — Connection of IP network (Ethernet RJ45)
5 — Connection to the External Communications Recorder
6 — Connection to the External Microphone
7 — Connection to the Microtelephone or Console's Pedal

Delivery Set

The delivery set includes a console panel with a screen size of 12'' (touch screen), microtelephone, 220 В power supply unit

Options

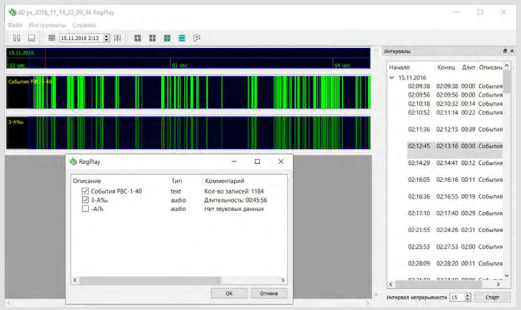
1. Loudspeaker

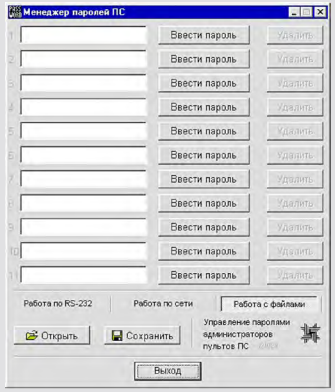
6 W Power

2. Microphone

Desktop Microphone

3. RegPlayer software and PS password manager



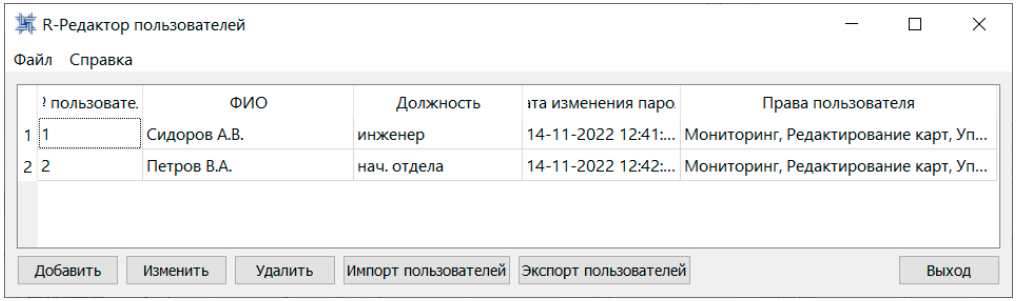


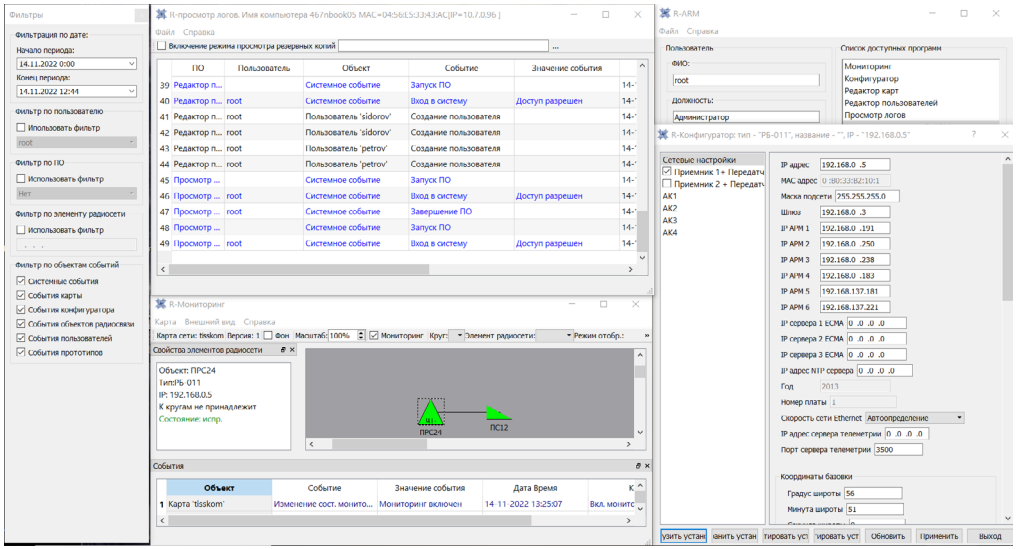
Monitoring and Control System of R-ARM2 Radio Network

Description

The software is used for monitoring and control of the radio network equipment of the DMR standard produced by IRZ.

The access to monitoring and control of the network has a multi-stage protection: administrator's IP-addresses lists, the user right assignment and use of passwords.

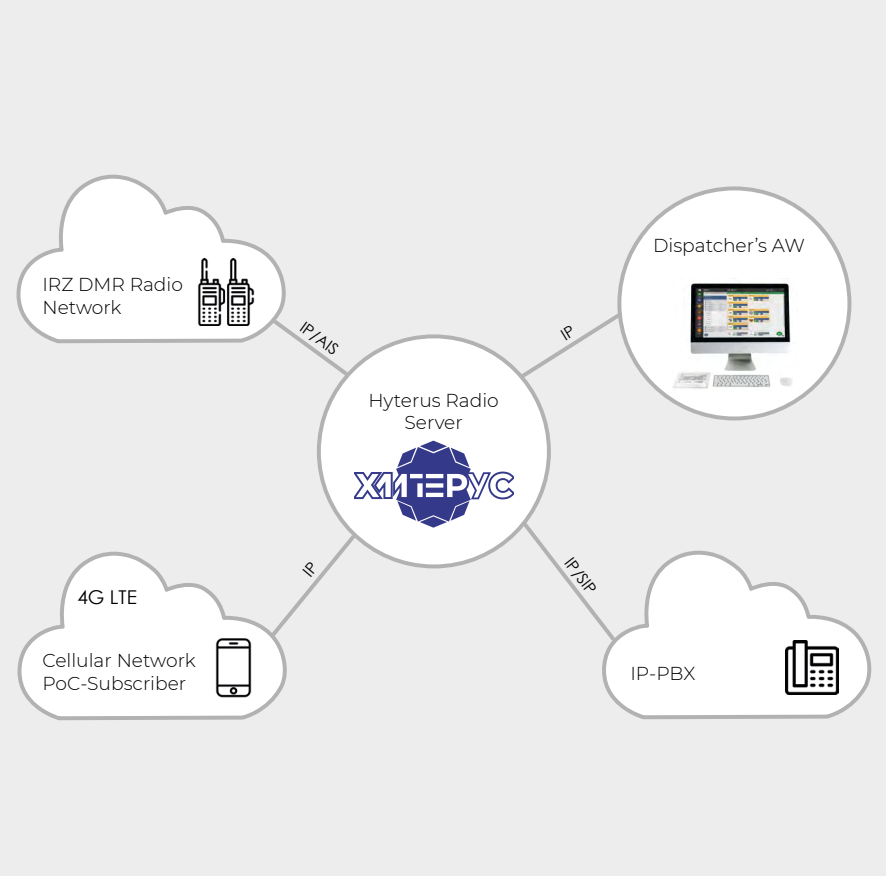




The software performs the following functions:

- Management of user rights
- Network elements configuring
- Network elements status and parameters monitoring: KCB, RSSI, power
- Viewing an event log
- Searching and listening to communications records
- Backup coping of network elements parameters

Hyrerus Dispatcher’s Software



Description

IRZ Mobile Radio System in integrated in hardware and software system Hyterus of domestic production via AIS (IP) protocol.

Hyterus hardware and software system is built on the client-server architecture and provides the multilateral dispatcher connection in radio networks of the DMR standard via IP-protocol.

Function

- Support for the server part of Linux and Windows operating systems
- Use of passwords and user right assignment for the software functions
- Providing communication with cellular networks subscribers by the cellphone app on Android operating system via PoC technology
- Connections establishment with the subscribers of the techological IP-PBX via SIP protocol
- Possibility to join radio commmunication systems of different vendors
- Flexible setting of the desktop interface and the dispatcher’s AW: the size and location of the windows, lists of the observed objects, sound signals, backup copying

Hyterus Software Functionality

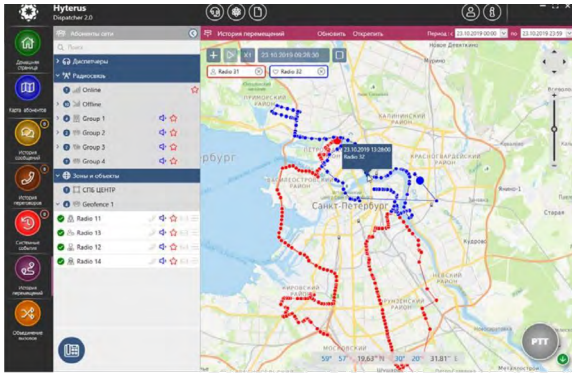
All types of voice calls (individual, group, broadcast multigroup, circular, telephone etc.) are possible from any dispatcher's/ operator's working place.

Analitical reports can be created and the summarized information can be received in the form of summary tables and activity charts: the reports on calls, radios status, routes tracking, parameters and indicators of the monitored equipment, etc.

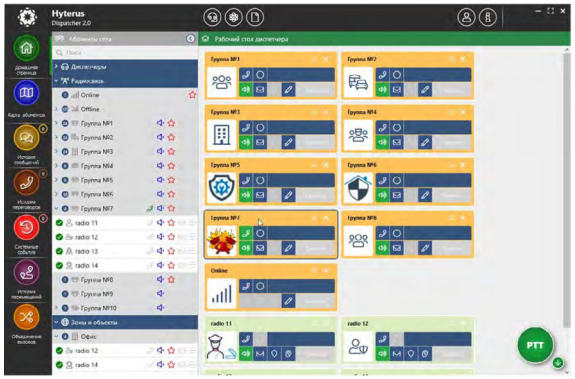
Recording and listening to all types of voice calls in the radio network, storing all the data, received from the observed objects and all the events, registered by the system. Filtering by the time or subscriber's number helps to find the target dialog, event or the data received.

Monitoring of the location and tracking of the movement of the subscribers with regard to the target areas, objects and routes. Various maps (Google MAPS, OpenStreetMap, MapInfo etc.) are supported at the user's request as well as personal map layers can be created such as plans and schemes of the target territory and infrastructure. The users can see the route of movement of the radio on the map with the set time frames.

Color indication of the subscriber status: grey — «out of the coverage»; green — «the subscriber is in the network»; blue — «the subscriber transfers the voice»; red — «the subscriber signaled an emergency or is blocked (a remote disconnection)».



Sending and receiving messages from the subscribers registered in the radio system.

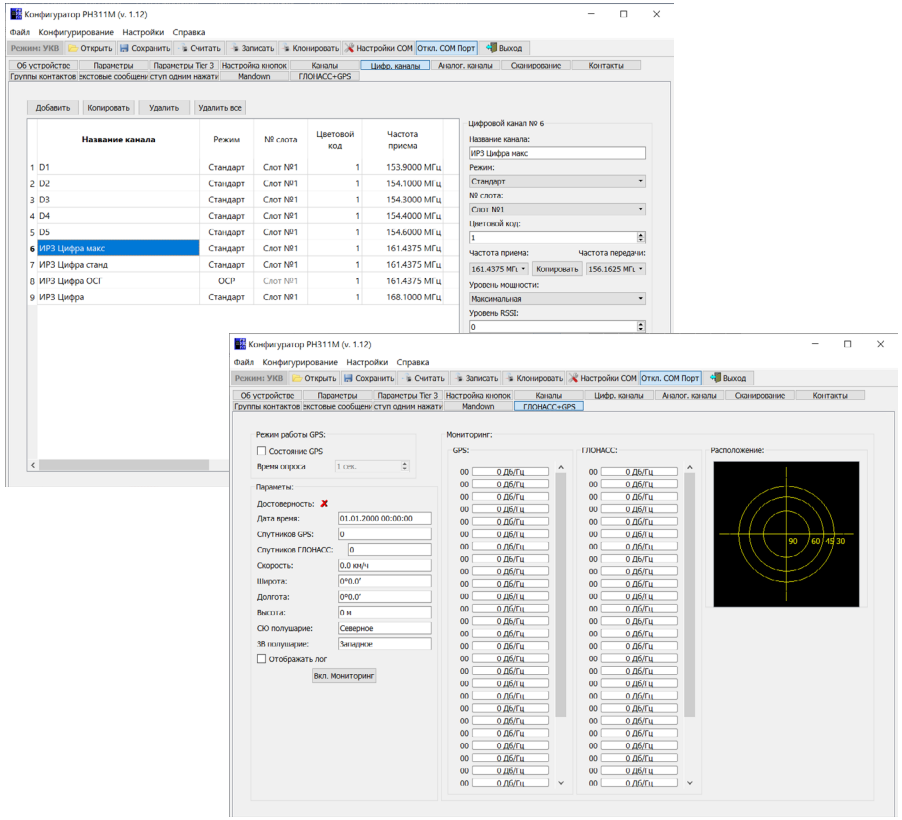


CONFIGURATOR Software to Configure the Radio

Description

The software is used for configuring the channels and services of the subscriber radios of the DMR standard produced by IRZ.

For connection of the computer to the radio, the USB programming cable is used (service connector RN311M). The RS232 connector is used for RM211.



The software provides the following functions:

- Viewing device information
- Configuring and monitoring radio's parameters
- Buttons configuration of the radio
- Configuring digital and analog radio channels and their assignment
- Configuring the scan list of radio channels
- Recording of standard text messages for sending
- Configuring ManDown function for portable radios
- Configuring the service and transferring of GLONASS/GPS coordinates and their monitoring

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