

“KB ELECTROMETRY”



MULTI-ELECTRODE ELECTRICAL RESISTIVITY & INDUCED POLARIZATION IMAGING INSTRUMENTS

MODEL: "SibER 48K12»



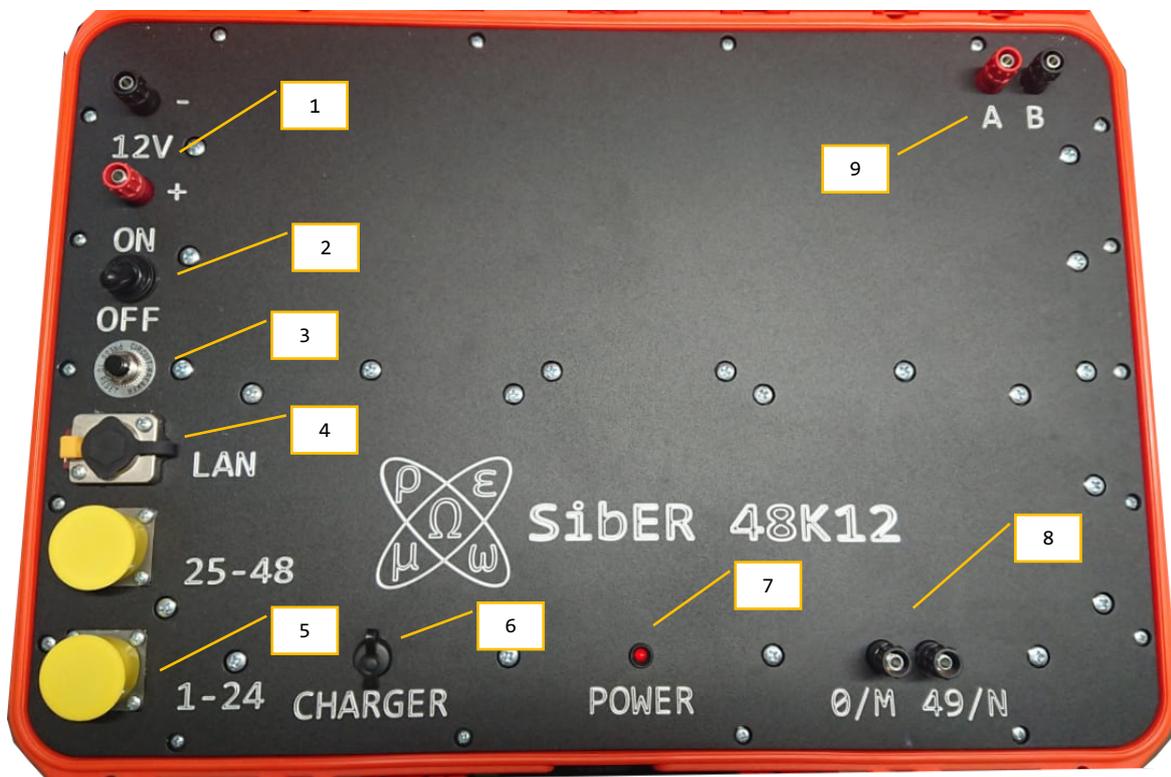
СК.48K12.01PЭ

1. Description and work

1.1 Purpose and scope

The equipment is designed to perform ground (including profile, areal, borehole) electrical exploration by methods of resistance and induced polarization in modifications of electrical tomography and vertical electrical sensing.

1.2 Instrument panel



1. The power supply terminals.
2. Power ON/OFF.
3. Automatic protection.
4. LAN connector.
5. The connectors of the electrode cable.
6. Charger connector.
7. Power indicator.
8. Terminals for connection of remote electrodes 0, 49 and measuring electrodes M, N.
9. Source output terminals for diagnostics and connection of supply electrodes A, B.

1.3 Specifications

General

Electrodes: 2 x 24 + 2 remote
External power supply: 12V
Backup power: 12V, 2.3 Ah
Interface: Wi-Fi, Ethernet
Degree of protection: IP67 (transport), IP54 (operation)
Working temperature: -20 ... +50 °C
Dimensions: 464 x 366 x 176 mm
Weight: 12 kg

Source

Type: voltage source
Output voltage: 1 ... 500 V
Output current: up to 2A
Output power: up to 220W
The shape of the output pulses: rectangular alternating polarity
Output pulse duration: up to 10 s
The duration of the intervals between output pulses: 20 ms
Output short circuit protection: Yes

Multi-channel meter

Number of channels: 12
Input impedance: 10 MOhm
Number of counts: 1 ... Five hundred
Sample rate: 50, 60Hz
ADC bit rate: 24 bit
Input voltage: -20 ... 20 V

Resolution: 1 μv

Industrial frequency interference suppression: at least 90 dB

Overvoltage protection: up to 1kV

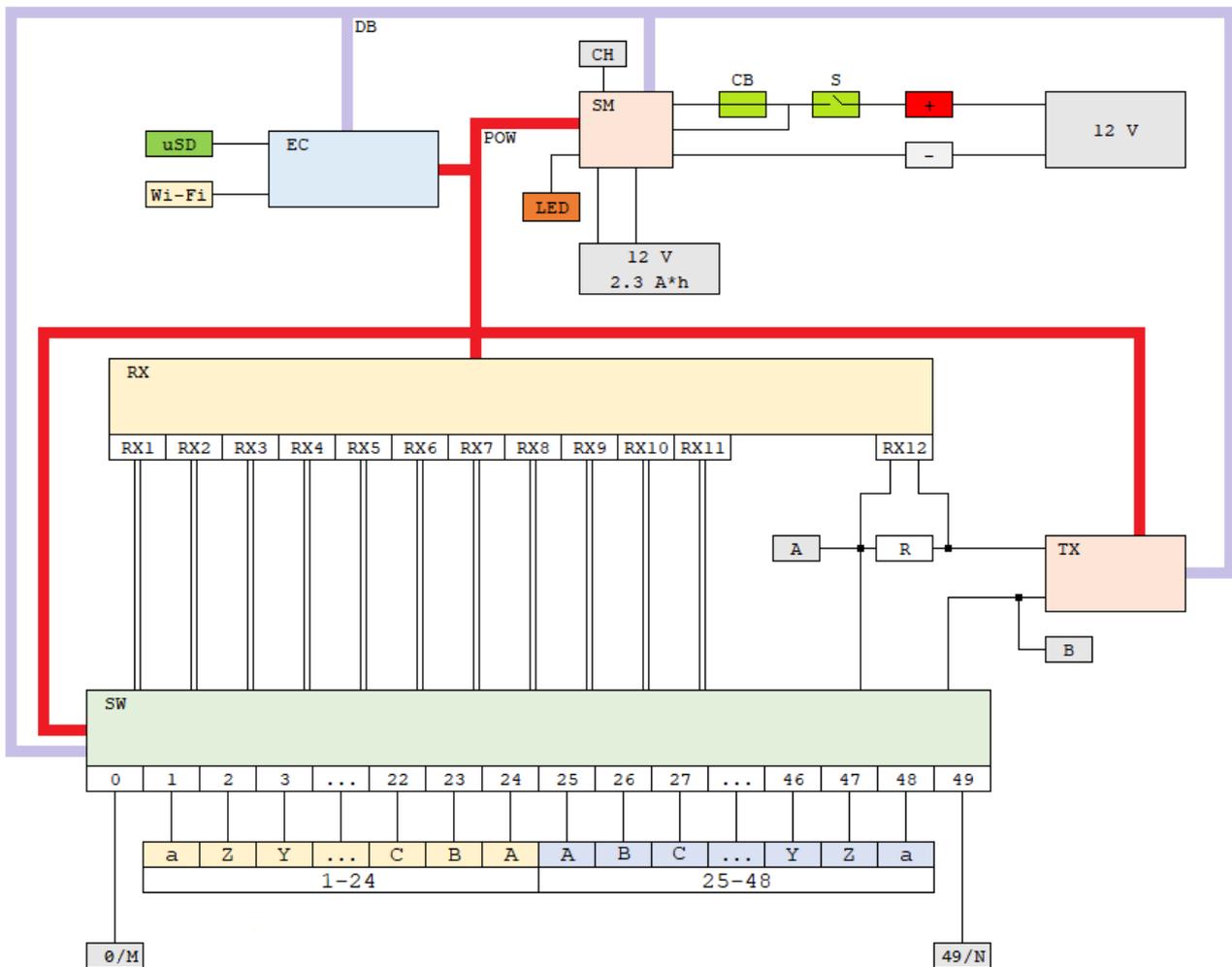
Power module

Protection against reverse polarity at the entrance: Yes

Supply voltage range: 10.5 ... 15 V

Indication of lack of power: sound, LED

1.4 Flow chart



| | |
|--------------|--|
| EC | - Control and communication Module. |
| SD | - MicroSD memory Card. |
| Wi-Fi | - Wireless communication Module. |
| Eth | - Wired communication Module. |
| DB | - Data Bus. |
| POW | - Power Lines. |
| CH | - Charger connection Connector. |
| SM | - Power management Module. |
| LED | - POWER Led on the dashboard. |
| 12 V, 2.3 Ah | - Backup battery. |
| CB | - Circuit breaker on the instrument panel. |
| S | - Toggle switch on the dashboard. |
| + - | - The power supply terminals on the dashboard. |
| 12 V | - Rechargeable battery. |
| RX | - Multi-channel meter. |
| RX1... RX11 | - Measure the input voltage. |
| RX12 | - Output current meter. |
| A B | - Source output terminals on the instrument panel. |
| R | - Current shunt. |
| TX | - Source. |
| SW | - Switch. |
| 0 ... 49 | - Numbers of the output lines of the switch. |
| 1-24 | - connector "1-24 " on the dashboard. |
| a ... A | - connector pin numbers "1-24". |
| 25-48 | - connector "25-48 " on the dashboard. |
| A ... a | - connector pin numbers "25-48". |
| 0/M 49/N | - Terminals "0/M 49/N" on the dashboard. |

1.5 Device and principle of operation

1. The control and communication module controls the devices included in the equipment and communicates with the external control panel and data acquisition.
2. The MicroSD card stores the control and communication module software.
3. The wireless communication module is designed to connect and exchange data with an external control panel and collect data via a wireless Wi-Fi network.
4. The wired communication module is designed to connect and exchange data with an external control panel and collect data via a wired Ethernet network.
5. The data bus links the devices that make up the equipment into a single network for internal data transmission.
6. The power lines controlled by the power management module are designed to power the devices included in the equipment.
7. The power management module performs diagnostic (power status monitoring) and protective functions (emergency shutdown of an individual or all power lines due to short circuits or insufficient supply voltages).
8. The external battery (not included in the equipment) is connected to the power terminals on the dashboard and is designed to power the devices included in the equipment.
9. The “POWER” LED on the dashboard is used to indicate the status of the external power supply (lit continuously with normal power, flickers when there is insufficient power or no power).
10. Backup battery (included in the equipment) and is designed for backup power of some devices included in the equipment, in moments of insufficient external power.
11. The source creates rectangular voltage pulses of positive and negative polarity of a given amplitude and duration in the load.
12. The circuit breaker on the dashboard is designed to protect against a short circuit inside the source.
13. The multichannel meter registers instantaneous values of input voltage, output current of the source (through the current shunt).

14. The switch is designed for switching the supply lines of the source and the measuring lines of the multichannel meter to the contacts of the electrode cable and the connectors of the remote electrodes.
15. The output terminals of the source on the instrument panel are designed for operation by the method of vertical electrical sounding and diagnostics of the equipment.
16. Connectors "1-24" and "25-48" are intended for connection of electrode cables with corresponding numbers of electrodes.
17. The external source connection terminals are used to connect to the corresponding external source terminals.

The instrument performs:

1. Measurement of transient resistance of the electrodes after they are ground.
2. Switching of feeding and measuring electrode in a multi electrode cable.
3. Excitation of electric current in the supply lines of electrical installations
4. Registration of instantaneous values of the source output current.
5. Registration of instantaneous value of input voltage.
6. Data transmission to the control panel and data collection.

1.6 Precautions

1. Do not touch the dashboard connectors and electrodes during operation to ensure normal operation and because of the risk of electric shock.
2. Do not operate the equipment, if possible, to allow moisture (splash, rain, snow) and dirt into the dashboard and connectors, as well as prolonged exposure to direct sunlight on the dashboard due to the risk of overheating of the equipment.
3. Do not over-inflex the cable (winding cable on a coil with an inner diameter of less than 100 mm, not arbitrary tightening of nodes). The minimum bending radius of the

3. The use of plug connectors for power supply is not allowed.

2.2 Working Procedure

1. Ground the electrodes and connect them to the electrode cable.
2. Connect the electrode cables and remote electrodes to the equipment.
3. If necessary, connect the equipment with an external remote control and data acquisition modules by cable.
4. Observe the polarity and connect the power cables to the terminals of the equipment.
5. Observe the polarity and connect the power cables to the battery terminals.
6. Push toggle switch in the “ON” position.
7. Connect to a wireless network of Wi-Fi equipment.
8. Start the Xeris control program on the external control and data acquisition panel. The description of the program is given in the operator's manual.
9. Connect to the equipment in the Session menu.
10. Perform an electrode grounding test in the electrode Test menu.
11. Start a measurement session in the menu "Start a new at session" or "Start a new VES session".
12. After the measurement session is completed, perform the shutdown in reverse order.

2.2 MicroSD card

The MicroSD card stores the control and communication module software. If necessary, you can replace the map or update its contents.

How to replace a MicroSD card:

1. Unscrew the 18 screws located at the edges of the dashboard
2. Carefully remove the equipment from the case.
3. Through the hole in the bottom of the frame, remove the MicroSD card.

2.4 Backup battery



The backup battery requires regular charging regardless of the usage frequency of the equipment. It is recommended to fully charge the battery before each use. For preventive purposes, it is recommended to fully charge the battery at least once a month.

How to replace the backup battery:

1. Unscrew the 18 screws located at the edges of the dashboard.
2. Carefully remove the equipment from the case.
3. Disconnect the 2 power wires from the battery.
4. Carefully unscrew the 4 screws securing the battery.
5. Replace the battery and assemble in reverse order.