

**INDICATION BLOCK**

**"S2000-BI"**

Maintenance guide

2003

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The purpose of the present maintenance guide is help for studying operability principles and maintenance of indication block "S2000-BI" (below - block). Block version is shown on the label on the processor, which can be seen when console back cover is open.

## 1 Description product and its operability

### 1.1 Purpose.

1.1.1 Block is design for sending messages, received through RS-485 interface from S2000 console or computer, to built-in light notifiers and sounder.

1.1.2 Block can be used in the "Orion" system jointly with other system devices. Block is designed for joint work with check-control fire-alarm "Signal-20", "Signal-20P", "S2000-4" devices and 2-wired "S2000-KDL" controller. It allows to get through "S2000" controller or computer messages from these devices and display states of controlled partitions on built-in indicators and sounder controlled.

1.1.3 Block is designed for continuous 24-hour work in conditioning rooms in absence of direct environment influence.

1.1.4 At off-line guarding or at combination off-line and centralized guarding block through check and control console "S2000" or computer displays for operator alarm and service messages of "Orion" system devices. It also allows "S2000" console or computer operator to program block configuration parameters, to check state of indication block case integrity.

1.1.5 Block's stability to mechanical and climatic effect is a mark of conformity to Russian standards, but for work in temperature span from 274 to 318 K (from +1 to +45) °C

1.1.6 Block transmits the messages:

- 1) "Blocking break" at case opening;
- 2) "Reset" at block micro controller reset.

1.1.7 At power turning on block requests status of sections for putting marker into initial position.

Block event notifications are shown in the tables 1 - 4.

Table 1 **LED "WORK"**

<b>Block operation modes</b>	<b>LED state</b>
In all modes if RS-485 interface exchange is available	Continuously on
In all modes if RS-485 interface exchange is not available	Blinks with the frequency 1 Hz

**Table 2 Indicators"1-60"**

<b>Partition state</b>	<b>Indicator states</b>
ARMED	Red (green, if block type is fire)
DISARMED	Green (blink green light with frequency 2 Hz, if block type is fire)
ALARM	blink red light with frequency 1 Hz
INTRUSION	blink red light with frequency 1 Hz
NOTARMING	blink green light with frequency 1 Hz
FIRE	blink red light with frequency 2 Hz
ATTENTION	blink red light 0,25 s on, 0,75 s off
FAULT	blink green light 0,25 s on, 2 s off

Note – If several messages from the same partition are received, the message with the highest is displayed. Message priorities are set the next way: "Fire", "Attention", "Sabotage", "Fault" – for fire partitions; "Attack", "Alarm", "Sabotage", "Not arming" – for guard and alarm partitions. At "Disarming" message indicator of corresponded partition flashes green light (blinks green light with the frequency 2 Hz, if block type is fire). At "Arming" message indicator of corresponded partition flashes red light (green, if block type is fire).

Partition transits in "FAULT" state at loops fault (short circuit or break), address detector disconnections or faults, breaking of check partition devices connections.

**Table 3 Sounder**

<b>Partition state</b>	<b>Sounder state</b>
ALARM	On with frequency 2 Hz
ATAACK	On with frequency 2 Hz
FIRE	1,5 s on, 0,5 s off
ATTENTION	On 2 times 0,25 s, 1,25 s off
FAULT	0,25 s on, 3,75 s off

Sound signal resets by "RESET" button. In the case block transmits message "Operator action" to "S2000" console or computer. Sound signal can be reset automatically (if it is set in block configuration) after the time, selected at block configuration. At sound reset no message to the console is transmitted.

**Table 4 System indicators states at receiving alarm messages**

<b>Partition state</b>	<b>Indicator sates</b>
ALARM	blink red light with frequency 1 Hz
ATAACK	blink red light with frequency 1 Hz
NOTARMING	blink red light with frequency 1 Hz
FIRE	blink red light with frequency 2 Hz
ATTENTION	blink red light: 0,25 s on, 0,75 s off
FAULT	blink red light: 0,25 s on, 2 s off
BLOCKING	Reserved

## 1.2 Specifications

1.2.1 Block is powered by power supplier voltage from 10,2 to 28,4 V.

1.2.2 Block consumed current - less 0,2 A.

1.2.3 Block consumed power – less 3 W.

1.2.4 Block system configuration parameter is "**network address**", controlled partitions numbers and "**Block type**" (guard/fire). Block "**Network address**" is used for connection through RS-485 interface. At connection block to the connection line it has unique address.

1.2.4.1 Range of values network block address is from 1 to 127.

1.2.4.2 Default network address value is 127.

1.2.4.3 Controlled partitions number is used for setting correspondence between "1-60" indicators and partitions.

1.2.5 Block connection line length with connected devices is less 4000 m.

1.2.6 Radio-interference from block don't go beyond the limit of Russian standards.

1.2.7 Block secures stability to electromagnetic noise of 3<sup>rd</sup> stickiness degree according to Mark of conformity to Russian standards

1.2.8 Average mean-time-between-failures of block – not less 40000 h, which is equal to probability of no-failure operation 0,97 during 1000 h.

1.2.9 Average time for restoration of block's capacity for work during the repair work - less then 60 min.

1.2.10 Average observed life – not less then 10 years.

1.2.11 Bulk of block- less then 1,2 kg.

1.2.12 Overall dimension of block- at most 370x38x190 mm.

1.2.13 Structure of block ensures it's fire-security in emergency-work mode and when breaking the rules of maintenance according to ГОСТ 12.1.004-91.

Control panel «C2000» or IBM compatible computer and interface converter RS-485/RS-232 "PI" is used to change the configuration. Program «**uprog.exe**», which version isn't less then 4.0.0.312, is used on the computer to set the configuration parameters of block.

Last version of block's configuration program "**uprog.exe**" and additional information about using the device can be found in Internet on **www.bolid.ru**.

## 1.3 Product's components

1.3.1 Block contains:

1) Indication block "S2000-BI" -1 unit;

2) Maintenance guide-1 copy.

3) Screw 1-4×40.016 with dowel – 3 units.

## 1.4 Description the product and capabilities

1.4.1 Block is designed in plastic case, which view is shown in the appendix A. Inside the case printed board with board elements is mounted. Wires are mounted by screw terminals.

1.4.2 Electrical diagram is shown in appendix B.

Block contents next functional units:

- potentiostat +5 V;
- microprocessor;
- nonvolatile memory;
- LED indicators;
- sounder;
- RS-485 interface converter;
- Case intrusion detector;
- Reset button.

1.4.3 Block work

Potentiostat +5 V feeds indication block circuits and indicators.

Microprocessor controls work of all block: receives messages through RS-485 interface, control by light indicators and sounder.

RS-485 interface converter matches TTL level signals to the RS-485 interface signals, and also convert levels of received RS-485 signal levels in logical signal levels.

LED indicators display partitions states, availability of alarm situations. LED indicators states correspond to tables 2, 4.

Sounder makes different sound notifications, corresponded table 3.

## 1.5 Measurement means, tools and accessories

Table 5 List of tools for repair in workshop

Name	Function	Analog
1 Voltmeter B7-38	Voltage and resistance measurements	Multimeter
2 Oscilloscope C1-102	Checking pulse availability and measure its length	Oscilloscope C1-107

Table 6 Estimated material charges for 10 devices for 1 year

Material	Quantity, g
Solder	20
Rosin	10
Ethanol	30
Acetone	30

## 1.6 Marking and sealing

1.6.1. Marking should correspond to the documentation.

On the label on the device case are pointed:

- 1) Manufacturer's trademark and name;
- 2) Designation and sign;
- 3) Serial number;
- 4) Year's two last digits and quarter of production;
- 5) Mark of conformity to Russian standards

Shipping container has signs, basic, additional and informational notices

## **1.7 Packing**

1.7.1. Ready product is the controller with documentation and spare parts, tested by quality control department and packed.

1.7.2 Conservation with corrosion-resistant protection is used.

1.7.3 Controller is packed in the pasteboard box with the spare parts and documentation. Spare parts and documentation are packed into polyethylene packet with sealed edges.

1.7.4 Boxes are packed in containers.

1.7.5 Each container contains pack sheet with the next information:

- 1) Panel designation and quantity;
- 2) Month and year of packing;
- 3) Packer's signature or stamp.

1.7.6 Admit use cargo containers for packing.

1.7.1 Net mass - no more 1,2 kg.

1.7.2 Gross – no more 1,5 kg.

## **2 Customizing**

### **2.1 Setup procedures**

2.1.1 Precautions:

- a) Device design satisfies to electro- and fire safety requirements;
- b) Device has not dangerous voltage circuits;
- c) Device design provides its fire safety in abuse and abnormal mode of operation;
- d) Mounting, setup, checking should be done when the power is off;
- e) Mounting and checking have to be done by qualified personnel only.

2.1.2 Before block connection it has to be configured:

- a) Set network address (valid values 1-127);
- b) Set correspondence between "1"... "60" indicators and partitions;
- c) Set time for sounder (valid values 0-255 s, if it equals 255 signal is not reset);
- d) If necessary, set partition save flag;
- e) Set block type (0-guard, 1-fire).

Default settings:

- Network address 127;
- Sounder time 255;
- Partitions 1-60 (i.e. 1 indicator corresponds 1 partition and so on);
- Partition save flag saved;
- Block type – guard.

2.1.3. Mounting:

Device is mounted on the walls, behind the suspended ceiling, on the other constructions of guarded objects in the places, protected from atmospheric condensations, mechanical damages and intrusion of strangers.

Mount order:

- a) Fix device on the wall in convenient place;

b) Mount device and connection lines in accordance with the electric connection diagram, shown in the appendix C.

### 2.1.3 Connection RS-485 interface lines.

2.1.3.1 To connect the block to RS-485 trunk interface make next:

Connect contacts "A" and "B" of the block to A and B interface lines;

RS-485 interface use "bus" type connection for devices, i. e. all devices connected to one wire pair (lines A and B), matched by resistors from both sides. Resistors 620 Ohm are used. They are set on the first and on the last line devices. In "S2000-BI" block match resistor is situated on the board and can be connected by the jumper.

Branches in the line ("star" connection) is not recommended, because they increase reflect signal in the line, but, in practice, they are acceptable if length of the branches is not too long. In the case matching resistor is not set.

Resistance of the interface line (A or B) form block to the most remote device has to be less 200 Ohm. If interface line has longer length (more 1000 m) or strong electromagnetic fields are present it is recommended to use curved pair.

"0 V" console and block circuits have to be connected (it is not necessarily to joint "0 V" device circuits if block and console connected to the one power supply).

## 3 Technical support

This procedure is intended for fire-alarm systems personnel (FAS). It include contains operability checking and troubleshooting procedures to determine device state. The procedure includes detector operability test for its technical state estimation and defects revelation. Device mismatch requirements, described below, are the reason for reclamation to the manufacturer.

Year block checking operations include:

- a) Check case integrity;
- b) Check operability according to item 3.1 this manual;
- c) Check cleat slot mounting, wires, contacts.

### 3.1 Operability checking

This procedure is intended for fire-alarm systems personnel (FAS). It include contains operability checking and troubleshooting procedures to determine device state. The procedure includes detector operability test for its technical state estimation and defects revelation. Device mismatch requirements, described below, are the reason for reclamation to the manufacturer.

The test is carried at standard conditions:

- 1) Temperature -  $(25 \pm 10) ^\circ\text{C}$ ;
- 2) Relative humidity - 45 - 80 %;
- 3) Atmospheric pressure - 630 - 800 mm Hg. (84-106,7 kPa).

3.1.1 Block general test circuit is shown in the Appendix D. Total test time less 20 minutes.



Note: Wire connection and disconnection must be done when the device power is off.

### 3.1.2 Block checking steps:

- a) Check box and unpack device;
- b) Check package contents and spare parts;
- c) Check case integrity;
- d) Shake device and check any things inside;
- e) Check screw terminal mounting;
- g) Check block number an production date fuse availability, rating value

validity and sanity.

### 3.1.3 Block testing order.

Before connection check board short circuits, breaks and other mechanical defects. Chips have to set precisely as in key. Set output power voltage A1 block (10,2±0,3) V.

Turn on the block power. "WORK" indicator has to be turned on. During 1 min after console turning on indicator have to shows block detection message. Measure consumed current by ammeter PA1. Measured value has to be less 0,2 A.

Transit block in diagnostic mode by pressing shortly 3 times and long 1 times "RESET" button. In the case running indication of 60 2-color indicators, 8 system single color indicators have to arise. Sounder has to make short sound.

Turn off devices. Set output power voltage A1 block (28,4±0,6) V. Repeat check.

### 3.1.4 Log test results.

## 4 Permanent repair

4.1. List of tools for repair in the workshop is shown in the Table 7. Estimated material charges for 10 devices for 1 year are shown in the Table 6, in subsection 1.5. List of troubles is in the Table 7

**Table 7 Troubles and troubleshooting**

Defect, occurrence and additional features	Reason	Repair methods
1 'Work' indicator is off	No power supply voltage	Replace fuse
2 'Work' indicator blinks	Console is disconnected from devices	Restore connection
	Contacts A and B of RS-485 interface are confused	Change wires A and B of RS-485 interface
3 Block is not detected	The block has wrong or existed network address	Change block network address
	Contacts A and B of RS-485 interface are confused	Change wires A and B of RS-485 interface

4.2 Block repair has to be done in workshop by qualified personnel only. At repair IMCs have to be protected from static electricity with 100 V voltage.

## **5 Storage**

5.1 Keep blocks according to storage condition shown in documentation.

5.2 Acids and alkalis vapors, aggressive gases and other noxious have to absent at panel store rooms.

5.3 Storage life in package has to be no more then 6 months.

## **6 Transportation**

6.1 Packed blocks transportation can be done by any transport in covered packages.

6.2 Transportation conditions have to correspond to the keeping conditions.

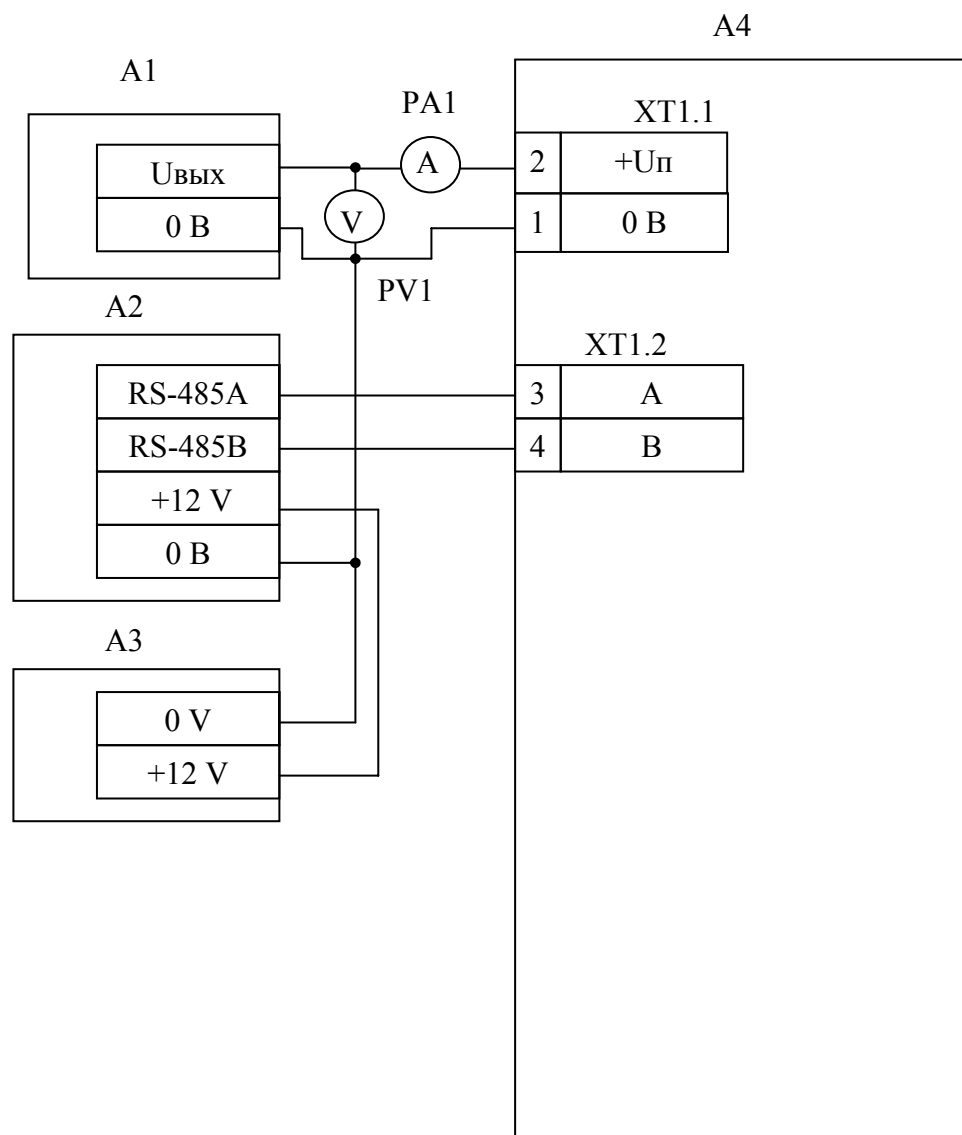
6.3 Boxes with blocks in transport have to be placed in stable position, and avoid impacts each other.

## **7 Warranty**

Manufacturer warrants its products to be in conformance with specifications under normal transportation, storage, mounting and maintenance for a period is of 18 months from the data of putting in to operation, but no more then 24 months from the data of manufacturing.

## Appendix D

### Connection diagram "S2000-BI" during test



- A1 – power supply from 10 to 30 V, 1,0 A;
- A2 – "S2000" panel;
- A3 – power supply 12 V, 1 A;
- A4 – Indication block "S2000-BI";
- PV1 – Combined device C4355;
- PA1 – Combined device C4355.

## 8 ACCEPTANCE AND PACKING

"S2000-BI"

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Product designation

serial number

Produced, tested by quality control department in compliance with state standards and specifications, and packed by NVP 'BOLID' company.

Q.C.

STAMP

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Name

Date