ADDRESSABLE ACOUSTIC GLASS BREAK DETECTOR
S2000-ST Rev.03

ИСО 9001

INSTRUCTION MANUAL

1 TECHNICAL INFORMATION

1.1 General

S2000-ST Rev.03 Addressable Glass Break Detector (hereinafter referred to as the detector) is an acoustic detector designed to sense breaking of common window glass of 2.5 to 8.0 mm thickness (marks M4 – M8 as per Russian GOST 111-90) or glass coated with a protective polymer film providing A1–A3 Protection Class as per RD 78.148-94 of Russian Ministry of Internal Affairs. The minimum area of the glass to be protected by a single detector is 0.1 square meters, each side being at least 0.3 m in length.

The detector sends alarms over the two-wire multiplex addressable polling loop (PL) to the connected polling loop controller S2000-KDL or S2000-KDL-2I of the Orion integrated security system. The detector is powered by and communicates data through the PL of the polling loop controller. The detector supports DPLS_v2.xx protocol and provides measuring of the addressable loop voltage at the point where it is connected.

The detector provides:

- Light indication of its operation modes;
- Setting an address and two-way communications with the polling loop controller;
- Anti-masking function;
- Discrete adjustment of detector's sensitivity;
- Protection against unauthorized tampering of enclosure.

The detector is intended for round-the-clock operation.

The detector is related to repairable, regularly maintained, and tested before usage products.

In terms of mechanical tolerance, the detector meets the conditions for Category 3 of OST 25 1099-83 and withstands vibration within 1 Hz to 35 Hz when accelerated up to 0.5 g.

In terms of ambient temperature and humidity tolerance, the detector meets the requirements for Climatic Category "O3" as per OST 25 1099-83, but to be used within temperature ranges of minus 10°C to +45°C and relative humidity of up to 90% at 25°C.

1.2 Specifications

1) The detector is powered by the controller via its polling loop.
2) The current consumption in the quiescent mode is 1 mA max.
3) Detection range: 6 m.
4) Operating temperature: minus 10°C to +45°C.
5) The detector provides noise immunity (doesn't generate alarms) as per GOST R 51186-98 when exposed to:
   - Non-destructive mechanical shocking the glass by a rubber ball of (0.39±0.01) kg weight and (60±5) IRHD as per GOST 20403-75 with striking energy of (1.9±0,1) Joules;
   - Harmonic acoustic signals producing a sound pressure level 80 dB maximum at the detector location;
   - Acoustic signal with white-noise spectral response producing a sound pressure level 80 dB maximum at the detector location.
6) The detector provides resistivity (doesn't generate alarms) to:
   - EMI as per GOST R 50009-2000 by such methods as "УК1" (Severity Level 2) and "УЭ1" (Severity Level 3).
   - Electromagnetic environment produced by a 150–175 MHz radio station with radiation power up to 40 W at a distance of at least 3 m from the detector.
7) MTBF in quiescent mode: 80,000 hours min.
8) Non-failure operation probability: 0.98758.
9) The detector remains functional when exposed to:
   - Ambient temperatures in the range of minus 10°C to +45°C;
   - Ambient air relative humidity up to 90% at +25°C;
   - Harmonic vibrations with acceleration of 4.9 m/s^2 (0.5 g) within 10 Hz to 55 Hz;
   - Striking with a hammer at a rate of (1.500±0.125) m/s and energy of (1.9±0.1) Joules.
10) While being transported, the packaged detector shall withstand:
    - Transportation bounce with acceleration of 30 m/s^2 and repeated shocks 10 to 120 impacts per a minute or 15000 shocks;
    - Ambient temperatures ranged from minus 50°C to +50°C;
    - Relative air humidity (95±3) % at +35°C.
11) Enclosure protection: IP30 as per Russian GOST 14254-96.
12) Overall dimensions: 75 mm × 65 mm × 25 mm max.
13) Weight: 0.1 kg max.
14) The content of precious material: does not require accounting for storage, retirement, and disposal.

2 MOUNTING AND ADJUSTING

2.1 Mounting the Detector

While selecting a mounting location for the detector please take into account the following considerations:

- The detector is recommended to be installed at the height of at least 2 m (Figures 2 to 7);
- If the detector and an active ultrasonic detector are used in the same area, the distance between the devices shall be at least 1 m;
- The detector should not operate in the premises with acoustic noise level higher than 65 dB (this approximately matches to a normal spoken voice of two people within premises);
- In the armed premises all the doors and windows shall be closed and all the wire-broadcast loudspeakers and other sources of sound shall be shut off;
- All the parts of the protected glass should be within clear view of the detector (the microphone beam pattern angle ≈120°);
- The distance between the detector and the farthest point of the glass to be protected by detector should not exceed 6 m.

Examples of locating the detector are shown in Appendix A.

2.2 Connecting the Detector

WARNING:

The total current consumption of all the addressable devices connected to the PL controller must not exceed 65 mA. For example, if only S2000-ST rev.03 detectors are brought into the polling loop then their maximum number N is estimated as:

N = 65mA / 1mA = 65

PL characteristics must comply with those described in the PL controller's User's Manual.

You can check for proper mounting and proper estimation of the number of the detectors to be connected to the PL by using UProg. Request for PL voltage value at every connected addressable device and ensure these values exceed 7 V.

Figure 1 shows a standard schematic for connecting the detector into the polling loop of a polling loop controller. When the detector is used as an intrusion one please set in the controller configuration its input type as 5 "Intrusion with Tamper Monitoring" or 7 "Entrance". To get more information about input types and setting them in the configuration of the PL controller please refer to operation documentation for the polling loop controller in use, the S2000M panel, or Orion Pro Workstation.

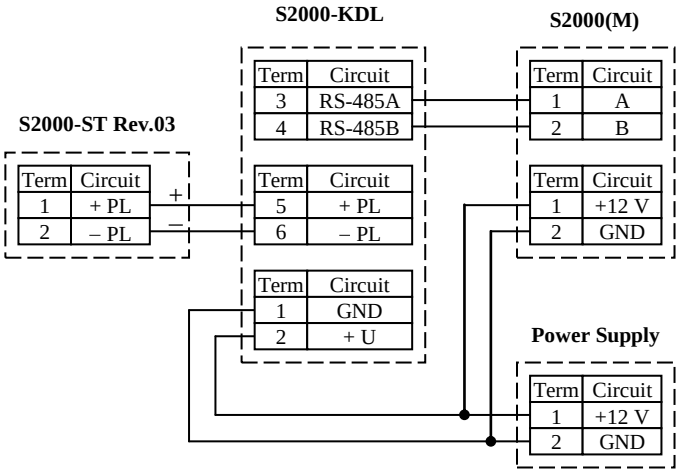

Figure 1. Connection Diagram

2.3 Setting the Detector PL Address

The detector comes with the PL address 127. The PL address is stored in the non-volatile memory of the microcontroller (EEPROM). The address range is 1 to 127. To change the device address, send the *Change Device Address* command from the network controller with the old and new addresses of the detector as parameters. Ensure that messages about disconnecting the detector with the old address and connecting the detector with the new address are displayed by the network controller. Write the newly set address on the marking area of the detector. If two or more detectors have the same addresses then use the *Set Device Address* command. For doing so, send this command specifying the new address from the network controller. Then remove the detector's cover and ensure the detector has entered the programming mode indicating this by LED illuminating once per 2 seconds. Next, perform a combination of presses on the detector's tamper switch – LLLS, where "L" is for a long press (longer than 1 s but shorter than 5 s) and "S" is for a short press (0.3 s to about 1 s). A pause between presses shall not exceed 5 s. Changing address shall be confirmed by LED turning off and the network controller shall display a message about connecting the detector with the newly programmed address. Write this address on the marking area of the detector. If you failed to perform the press combination then do nothing for 5 s and then try again.

To get more information about setting addresses of the devices connected into the polling loop please refer to the manuals for S2000-KDL, S2000M panel, and Orion Pro Workstation.

NOTE: While adjusting the detector as described below, the parameter Device Indication Control for the address point of the detector is essential. This parameter is set in the configuration of the polling loop controller by means of the UPROG.EXE utility and shall be equal to "1" (local indication control).

2.4 Adjusting Sensitivity of the Detector

The detector can be set to one of the three following levels of sensitivity: maximum (0 dB), medium (-6 dB), and minimum (-12 dB). The detector comes preset to maximum sensitivity. Sensitivity can be adjusted by sequential presses on the tamper switch (see Table 1 where a character "L" stands for a long press and "S" stands for a short press). Changing sensitivity setting is confirmed by relevant indication. A wrong combination of presses follows in LED pulsing 8 times.

Table 1. Sensitivity Adjustment

Press Combination	Action	Indication	Distance to Protected Glass (approximately)
LSSL	Sets min sensitivity level	One flash	Less than 1.5 m
LSLS	Sets medium sensitivity level	Two flashes	1.5 – 3 m
LSLL	Sets max sensitivity level	Three flashes	3 – 6 m
LSSS	Requests for the current set sensitivity level	Depends on the current set level	

Testing sensitivity of the detector can be carried out with the help of Honeywell FG-701 Glassbreak Simulator or similar one.

The test procedure is as follows:

1) Set the level of detector's sensitivity depending on the distance to the protected glass as shown in Table 1.
2) Put the cover on the detector.
3) Set the FG-701 to TEST and FLEX.
4) Position the FG-701 near the glass to be protected.
5) Press the RED button and then gently tap the glass with a soft tool. The simulator shall respond.
6) The LED of the detector shall flash at least 7 times successively which means that the detector is triggered. If the detector does not respond then increase its sensitivity and repeat the test from Step 4.

2.5 Enable / Disable Masking Protection

The detector features an anti-masking function. In case of an attempt to sabotage the detector (for example, the acoustic hole is obscured by an adhesive tape or chewing gum) the detector sends an Anti-Mask alarm.

The detector comes with the disabled anti-masking feature.

If the version of the polling loop controller is 2.14 or higher, then the anti-masking option is operated by software via the PL controller (see the *Anti-Masking* parameter on the tab *Inputs* of the UProg).

Otherwise, if the version of the polling loop controller is lower, the anti-masking option should be enabled / disabled manually. To **enable** this function please perform the **SLSL** sequence of presses while to **disable** the function please perform the **SLSS** one. The masking protection starts operating in one minute since the detector cover is put on it. During this time no things shall be located within 20 cm from the acoustic hole.

3 MAINTENANCE

The detector shall be maintained at least annually by electricians qualified for Electrical Safety of Class III or higher.

Maintenance works include:

1) Inspection for physical damage, reliability of fastening, and terminals tightening;
2) Cleaning of the detector's terminals and enclosure from dust, debris, and corrosion;
3) Testing functionality of the detector as described in para 2.4 of this Manual.

4 STANDARD DELIVERY

Product	Q-ty	Comment
S2000-ST Rev.03 Addressable Glass Break Detector	1 pc.	
Accessories: - Woodscrew 1-3×25.016 - Wall plug 6x30	 2 pcs. 2 pcs.	
Instruction Manual	1 copy	

5 MANUFACTURER WARRANTY

5.1 The manufacturer guarantees that the detector meets with technical requirements specified in the manuals if the user follows the instructions for shipment, storage, installation, and usage.

5.2 The average lifetime is 8 years.

5.3 Warranty period is 18 months since putting the detector into operation but no more than 24 months from the manufacturer's date of issue.

5.4 In case of any issue related to setting and use of the product, please contact with the technical support: +7 (495) 775-71-55 or e-mail: support@bolid.ru.

5.5 The detectors which failed within warranty period shall be replaced free of charge for operable ones by the manufacturer.

6 CERTIFICATION

6.1 S2000-ST Rev.03 Addressable Glass Break Detector meets the requirements of Technical Regulations of Custom Union TR CU 020/2011 which is approved by Conformity Certificate No. RU Д-RU.ME61.B.00429.

6.2 S2000-ST Rev.03 Addressable Glass Break Detector is approved by the certificate of conformity of transportation security technical arrangement with their functional properties No.МВД РФ.03.000036.

6.3 The production of S2000-ST Rev.03 is certified with Certificate of Conformity GOST ISO 9001-2011 № РОСС.RU.ИК32.К00153.

7 CLAIMS

7.1 If the detector failed within warranty period the consumer should draw a report describing the failure with a conclusion about the need to replace the detector by the manufacturer.

7.2 No claim without such report and the detector's instruction manual will be accepted by the manufacturer.

8 MANUFACTURER ADDRESS

The Bolid Company, #4 Pionerskaya Str., Korolev, Moscow Region, 141070, Russia.
Phone/fax: +7 (495) 775-71-55 (multiline), **+7 (495) 777-40-20**, **+7 (495) 516-93-72**.
E-mail: **info@bolid.ru**. Technical Support: **support@bolid.ru**, **http://bolid.ru**.

9 ACCEPTANCE AND PACKAGING CERTIFICATE

S2000-ST Rev.03 Addressable Glass Break Detector with the serial number _____ is manufactured, accepted as per obligatory requirements of state standards and actual technical documentation, approved as proper for operation, and packaged by the Bolid Company.

Responsible for acceptance and packaging

QCD _____ _____

Full Name Date, Month, Year

APPENDIX A. EXAMPLES OF MOUNTING THE DETECTOR

Figures 2 to 7 display optimal S2000-ST rev.03 mounting locations while Figure 7 shows an example of wrong installation.

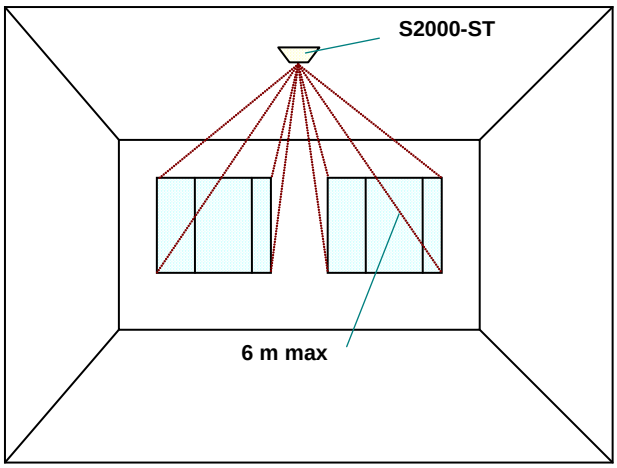

Figure 2: Ceiling Mounting

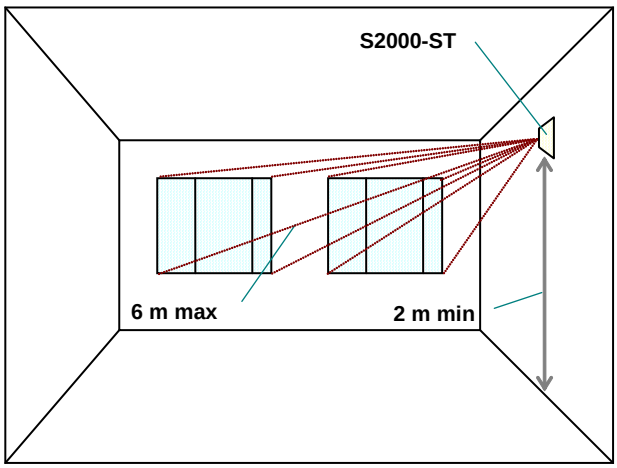

Figure 3: Adjoining Wall Mounting

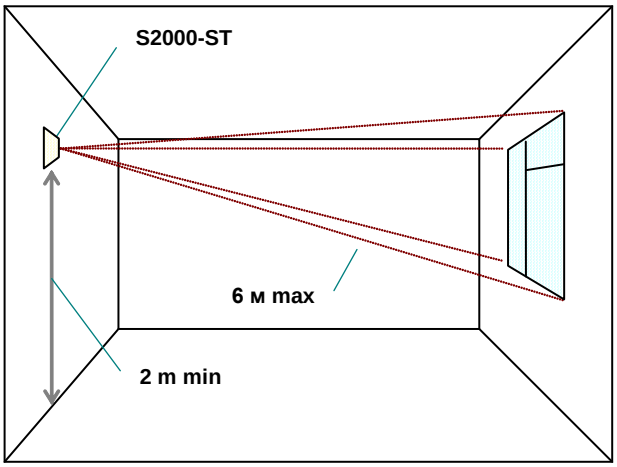

Figure 4: Opposite Wall Mounting

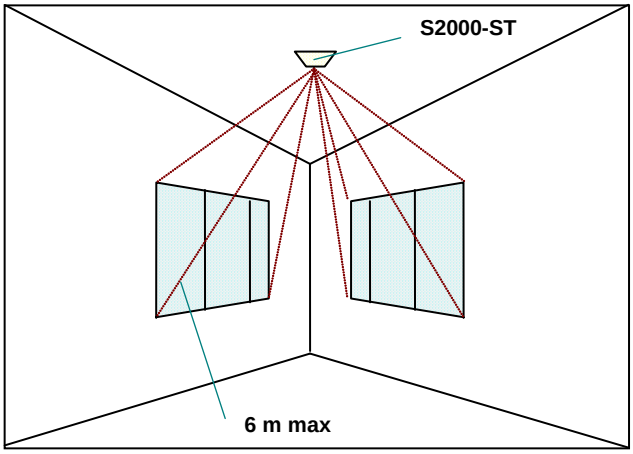

Figure 5: Ceiling Mounting

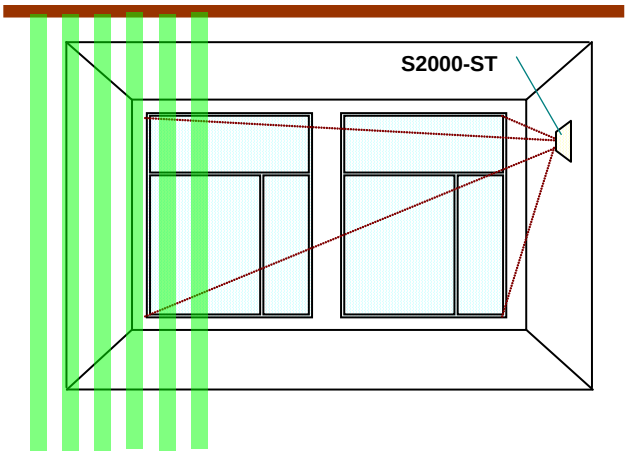

Figure 6: Mounting Behind the Curtains

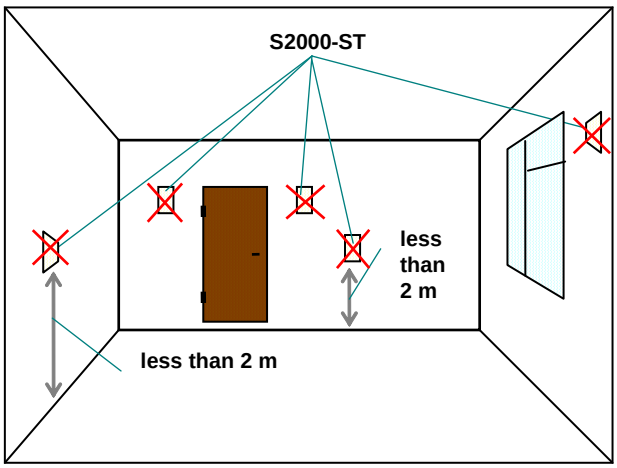

Figure 7: Poor Mounting Locations