S2000-4

INTRUSION&FIRE ALARM AND ACCESS CONTROL PANEL

Installer's and User's manual

<u>ATTENTION!</u>

To modify configuration parameters use the program

"uprog.exe" of version **4.0.0.810** or above.

You must not use for this procedure earlier versions of **"**uprog.exe**"**

or to modify parameters by means of

S2000 or S2000M fire and alarm console.

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This Installer's and User's manual is intended to help for studying operability principles and maintenance of version 2.03 of S2000-4 Intrusion&Fire Alarm and Access Control Panel.

1 PRODUCT DESCRIPTION

1.1   Product designation

Intrusion&Fire Alarm and Access Control Panel S2000-4 (hereinafter referred to as panel) is designated for usage in integrated safety systems to protect shops, pay-offices, banks, establishments, plants and other objects from fire or intrusion threats and to meet access control needs.

The panel is intended to:
- ✓ monitor four alarm loops with burglary and fire detectors included
- ✓ control internal and external sounders or light alarms
- ✓ transmit alarm signals to S2000/S2000M console or PC via RS-485 interface and to the centralized surveillance station through two relay outputs
- ✓ control the access with the help of Touch Memory keys and Proximity Cards, that is to read identifiers, to check assigned authority and to switch the contacts of relay controlling electromechanic lock.

The panel is designated for usage either in integrated "Orion" system (based on PC supplied by at least 7 issue "ARM Orion 1.0 KD" software or on "S2000" version at least 1.20 or "S2000M" fire and alarm console) or stand-alone use.

The panel is to be mounted inside the premises and is destined for clock round duration.

The panel must not be used in aggressive medium or dust condition, or in dangerous space.

The panel is intended to be used under temperatures from 233 to 323 K (from − 40 to +50 °C).

1.2   Specifications

The panel is supplied by external direct power voltage 12V (10.2 to 14.2 V DC) or 24V (20.4 to 28.4 V DC). It is recommended to use RIP-12 or RIP-24 uninterruptible power supplies manufactured by NVP BOLID Company.

Consumed power is less 3 W.

The table 1 is demonstrated the maximal consumed current in standby and 'Alarm' or 'Fire' modes.

The maximum number of alarm loops that can be connected to is 4.

Table 1: Consumed current in different modes

Detectors	Relays	Mode	Power voltage	
			12 V	24 V
There are no detectors being power supplied by loops (all detectors are contacting)	Turned off	Norm	100 mA	50 mA
		Alarm/Fire	140 mA	70 mA
	Turned on	Norm	150 mA	75 mA
		Alarm/Fire	200 mA	100 mA
All detectors are power supplied by loops, with consumed current being equal 3 mA in each loop	Turned off	Norm	130 mA	70 mA
		Alarm/Fire	170 mA	85 mA
	Turned on	Norm	180 mA	90 mA
		Alarm/Fire	220 mA	110 mA

The loop input voltage in stand-by mode varies from 19 to 24 V (depending on loop consumed current) and supports its value even in case of short circuit failure in one of the alarm loops.

The panel restricts the electric current through the actuating detector by value no more than 20 mA, voltage applied to actuated detector being above 6,8 V.

The ripple voltage effective value does not exceed 20 mV.

If burglary detectors are included into the alarm loop the panel provides in standby mode:

- the value of loop resistance being equal no more than 1 kOhm without regard to external element;

- the value of leakage resistance between wires or between any wire and ground being equal no less than 20 kOhm.

If fire detectors are included into the alarm loop the panel provides in standby mode:

- the value of the loop resistance being equal to value no more than 100 Ohm without regard to external element;

- the value of leakage resistance between wires or between any wire and ground being equal no less than 50 kOhm.

The panel supplies loop voltage for 'Okno', 'Foton-8' and 'Volna-5' burglary detectors and for 'DIP' fire detector. The maximum number of one alarm loop connected detectors is demonstrated by Table 2.

Table 2: Maximum number of detectors connected to one loop

Detector type	Maximum number of detectors for different loop types		
	Fire smoke loop with recognition (type 1)	Fire combined loop without two detectors activated in one loop recognition (type 2)	Burglary alarm loop (type 4)
'Okno-4', 'Okno-5'	–	–	40
'Folon-8'	–	–	1
'Volna-5'	–	–	1
'Shorokh-1'	–	–	1
'Stecklo-2'	–	–	1
'DIP-3M'	–	16 (6)	–
'DIP-3SU'	16	16 (6)	–
'DIP-U'	20	20 (8)	–

Note: The value in the parentheses corresponds to the detector's number in case of both smoke current-consumed (normally opened) and passive heat (normally closed) detectors being combined in one loop.

The number of other types detectors is calculated based on maximum load current being equal to 3 mA or 1,2 mA in case of type 2 alarm loop with both smoke or heat detectors being used together. In case of type 1 alarm loop using the detectors must retain their operability during loop voltage dropping to 12 V.

Only one Touch Memory key, or Proximity Card, or PIN-code reader can be connected to the panel. The reader output interface is to be Touch Memory (1-Wire, μ-LAN), Wiegand or ABA TRACK II magnetic card interface. The panel provides the reader's LED control with directly connected LED current being restricted up to 10 mA. The panel supplies the reader's sounder control. The quit options for LED and sounder control are 5V/10mA. The distance between the panel and connected reader must not exceed 100 m. The identifier storage capacity of the panel is 2048.

The number of control relays for locking arrangement is two with each relay maximum switching current being equal 7 A, maximum commutating voltage being equal 30V and maximum switching power being equal 100 W.

Following are the messages being transmitted by the panel to the net controller (both "ARM Orion" or "S2000"/"S2000M" console) via RS-485 interface:

"USER'S CODE ENTR"   - The user has entered arming/disarming code
"ACCESS GRANTED"   - Access was granted
"PASSED"   - A person was passed into the access zone

"ACCESS DENIED"	- Access is prohibited for this code
"ILLEGAL CODE"	- Access was denied due to the illegal code
"ACCESS CLOSED"	- Access is prohibited for all codes
"ACCESS FREE MODE"	- Access control is deactivated
"ACCESS NORM MODE"	- Access control is activated
"DISARMED"	- The detector status is not monitored
"ARMED"	- Detector status monitoring has been turned on
"ARM FAILED"	- Arming has failed due to the activated status of detector
"LOOP TRBL OPEN"	- Open-circuit failure in the alarm loop
"LOOP TRBL SHORT"	- Short circuit in the alarm loop
"FIRE SIGNAL"	- Fire conditions have been detected
"FIRE PREALARM"	- Fire signal has been received and fire alarm is probable
"FIRE ALARM"	- Fire alarm
"INTRUSION ALARM"	- Intrusion alarm
"SILENT ALARM"	- Silent zone alarm
"ENTRY ALARM"	- Entry zone alarm
"AUX ZONE ALARM"	- Auxiliary loop alarm
"AUX ZONE RESTORY"	- Auxiliary loop restored
"DOOR LEFT OPEN"	- Door is opened too long
"DOOR CLOSED"	- Door is closed after blocking in open state
"DOOR FORCED"	- Door has been opened without access granting
"TAMPER ALARM"	- Device or detector case is opened
"TAMPER RESTORE"	- Device or detector case is closed
"POWER FAILED"	- Device power supply is out of range
"POWER RESTORE"	- Device power supply is restored after failure
"PROGRAMMING"	- The panel has entered the user's key programming mode

If the panel was disconnected from net controller during message generation the event report would be stored in the panel non-volatile memory. When the connection would recover the event report will be transmitted to the net controller with the date and time of its origin being noted. The buffer storage in the panel non-volatile memory is sized to 1023 events.

The panel executes several commands having been received via RS-485 interface, which are configuration writing, net address assigning, loop arming/disarming, relay control, access control, access identifier reading, access identifier adding or changing, time synchronization or reading the non-dimensional loop resistance value given by digital-to-analog converter.

The panel uptime after power-on does not exceed 3 seconds.

The panel mean life is 20 000 hours.

The panel average operating life is 8 years.

The mass of the panel is about 0,3 kg, with overall dimensions being equal to 150×105×35 mm.

The panel construction design provides the ingress protection rating in accordance with IP20.

1.3 The delivery set

The S2000-4 panel delivery set is demonstrated in Table 3.

Table 3: The S2000-4 panel delivery set

Designation	Number
S2000-4 Intrusion&Fire Alarm and Access Control Panel	1
The replacement component set including: Resistances Screw nails Dowels	 4 3 3
Installer's and User's Manual	1

1.4 Alarm loops

The panel monitors four alarm loops and generates the following signaling depending on their status:

- displays the alarm loop statuses by means of internal two-color panel indicators "1" – "4" (see Table 14)

- turns the panel internal sounder on when loops have been troubled (see Table 15)

- displays the loop status with the highest priority by means of reader two-color indicator (see Table 13)

- controls the two panel relays.

The alarm loop status is defined by its type, its resistance and by the logical state (armed or disarmed). The status having been changed, the panel generates and sends corresponding messages to the net controller (either "ARM Orion" or "S2000"/"S2000M" console).

1.4.1 The loop configuration parameters

The alarm loop control algorithm can be changed by varying the loop configuration parameters that can be viewed in Table 4.

Table 4: Loop configuration parameters

Parameter name	Description	Range	Default value for 1 – 4 loops			
			1	2	3	4
Loop Type	Determines the control algorithm, available types of detectors to be connected and potential statuses	1…7, 11,12	7	4	4	1
Arming Delay	The time interval between having received arming command and loop transition to the "armed" status	from 0 to 255 sec	60	0	0	0
Intrusion/ Fire Delay	The delay for transitions from "ENTRY ALARM" to "INTRUSION ALARM" state or from "FIRE PREALARM" to "FIRE ALARM" one	from 0 to 254 sec 255 means Off (one detector having been activated, it must not transit "Fire Alarm" or "Intrusion Alarm")	30	0	0	120
Non-disarming	The loop cannot be disarmed by any way	On/Off	Off	Off	Off	Off
Auto Rearming When Disarmed	Auto transition from "ARM FAILED" to "ARMED" when loop having recovered	On/Off	Off	Off	Off	On
Auto Rearming When Fire/Alarm	Auto transition from "FIRE", "INTRUSION ALARM" or "SILENT ALARM" to "ARMED" when loop having recovered	On/Off	Off	Off	Off	Off
To Control When Disarmed	To monitor and transmit the resistance changes (is its normal or not) via RS-485	On/Off	Off	Off	Off	Off
The Alarm Loop Recovery Time	The time of making the decision that loop has recovered in case of "Auto Rearming when Fire/Alarm", or transition to "Aux Zone Restore" status, or disarmed loop control	from 0 to 255 sec	15	15	15	15

Parameter name		Description	Range	Default value for 1 – 4 loops			
				1	**2**	**3**	**4**
Relay 1 Control		Assign relay 1 to the particular loop	On/Off	On	On	On	On
Relay 2 Control		Assign relay 2 to the particular loop	On/Off	On	On	On	On
Relay 1 Control Delay		Relay 1 turning on/off delay for a particular loop	from 0 to 255 sec	0	0	0	0
Relay 2 Control Delay		Relay 2 turning on/off delay for a particular loop	from 0 to 255 sec	0	0	0	0
Scheduled Arming		Alarm loop auto arming at the given time windows	On/Off	Off	Off	Off	Off
Scheduled Disarming		Alarm loop auto disarming at the given time windows	On/Off	Off	Off	Off	Off
Time Window for Scheduled Arming/ Disarming		The number of time window defining the period of time with the disarming at the beginning and arming at the end	from 0 to 15	0	0	0	0
Loop Analysis Delay after Reset		The pause before alarm loop analysis after power dump (when "FIRE SIGNAL" or "ARMED")	from 0 to 255 sec	2	2	2	2
Common Zone		The alarm loop is common zone for other loops	On/Off	Off	Off	Off	Off
List of Associated Alarm Loops	**1**	If the alarm loop is common zone for other loops this parameter shows that ones	Yes/No	–	No	No	No
	2			No	–	No	No
	3			No	No	–	No
	4			No	No	No	–

1.4.1.1   Loop Type

The fundamental configuration parameter identifying the loop control method and detector types to be included is represented by "**Loop Type**". The panel supports nine alarm loop types.

The type 1 is the fire smoke loop with double actuation recognition.

The fire smoke (normally opened) detectors are included into the alarm loop. The alarm loop statuses can be:

"Armed" – the alarm loop is monitored and the resistance is in normal range.

"Disarmed" - the alarm loop is not monitored.

"Arming delay" – the arming delay has not yet been elapsed.

"Fire prealarm" – the single detector actuation has been fixed.

"Fire alarm" - actuating more than one detector has been fixed, or after first detector actuation the Intrusion/Fire delay has expired.

"Loop trbl short" – the alarm loop resistance is less than 100 Ohm.

"Loop trbl open" - the alarm loop resistance is more than 6 KOhm.

"Arm Failed" – the alarm loop was broken when arming.

When detector has actuated the panel generates the "Fire Signal" message and de-energizes the alarm loop for a short time. If within 55 seconds after de-energizing the detector connected to this loop repeats actuation the panel enters the "Fire Prealarm" mode at given loop. If the second actuating has not occurred within 55 seconds the alarm loop returns to the "Armed" state. From the "Fire Prealarm" mode the panel can transit to the "Fire alarm" mode if the second detector has been actuated or Intrusion/Fire delay has expired at this loop. If Intrusion/Fire delay was given as 0 then the transition from "Fire prealarm" to "Fire alarm" mode would happen instantly. If Intrusion/Fire delay was given as maximum value 255 then the transition from "Fire prealarm" to "Fire alarm" would be able only after actuating of the second detector at one loop.

The type 1 alarm loop resolving time is 300 ms.

The compatibility of loop resistance and the corresponding status can be shown at the Table 5.

The diagram of connection the fire smoke (normally opened) detectors to the type 1 alarm loop is contained into the Appendix C.

The type 2 is the fire combined alarm loop.

The fire smoke (normally opened) and heat (normally closed) detectors are included into the alarm loop. The alarm loop statuses can be:

"Armed" – the alarm loop is monitored and the resistance is in normal range.

"Disarmed" - the alarm loop is not monitored.

"Arming delay" – the arming delay has not yet been elapsed.

"Fire prealarm" – the heat detector actuation or second smoke detector actuation has been fixed.

"Fire alarm" - after detector actuation the Intrusion/Fire delay has expired.

"Loop trbl short" – the alarm loop resistance is less than 100 Ohm.

"Loop trbl open" - the alarm loop resistance is more than 50 KOhm.

"Arm Failed" – the alarm loop was broken when arming.

When heat detector has actuated the panel enters the "Fire Prealarm" mode. When smoke detector has actuated the panel generates "Fire Signal" message and de-energizes the alarm loop for a short time. If within 55 seconds after de-energizing the detector connected to this loop repeats actuating the panel enter the "Fire Prealarm" mode at given loop. If the second actuation of smoke detector has not occurred within 55 seconds the alarm loop returns to the "Armed" state. From the "Fire Prealarm" mode the panel can transit to the "Fire alarm" mode if Intrusion/Fire delay has expired. If Intrusion/Fire delay was given as 0 then the transition from "Fire prealarm" to "Fire alarm" mode would happen instantly. If Intrusion/Fire delay was given as maximum value 255 then the transition from "Fire prealarm" to "Fire alarm" would be impossible.

The type 2 alarm loop resolving time is 300 ms.

The compatibility of loop resistance and the corresponding status can be shown at the Table 5.

The diagram of connection the fire smoke (normally opened) and heat (normally closed) detectors to the type 2 alarm loop is contained into the Appendix C.

The type 3 is the fire heat loop with double actuation recognition.

The fire heat (normally closed) detectors are included into the alarm loop. The alarm loop statuses can be:

"Armed" – the alarm loop is monitored and the resistance is in normal range.

"Disarmed" - the alarm loop is not monitored.

"Arming delay" – the arming delay has not yet been elapsed.

"Fire prealarm" – the one detector actuation has been fixed.

"Fire alarm" - actuating more than one detector has been fixed, or after one detector actuation the Intrusion/Fire delay has expired.

"Loop trbl short" – the alarm loop resistance is less than 2 KOhm.

"Loop trbl open" - the alarm loop resistance is more than 50 KOhm.

"Arm Failed" – the alarm loop was broken when arming.

When the detector in such alarm loop has actuated the panel enters the "Fire Prealarm" mode. The panel enters the "Fire Alarm" mode from "Fire Prealarm" if the second detector has activated at this loop or Intrusion/Fire delay has been expired. If Intrusion/Fire delay was given as 0 then the transition from "Fire prealarm" to "Fire alarm" mode would happen instantly. If Intrusion/Fire delay was given as maximum value 255 then the transition from "Fire prealarm" to "Fire alarm" would be able only if the second detector in this loop has actuated.

The type 3 alarm loop resolving time is 300 ms.

The compatibility of loop resistance and the corresponding status can be shown at the Table 5.

The diagram of connection the heat (normally closed) detectors to the type 3 alarm loop is contained into the Appendix C.

The type 4 is the burglary alarm loop.

The alarm loop includes burglary detectors of all types, including normally closed, normally opened, powerless, supplied via alarm loop or separately.

The alarm loop statuses can be:

"Armed" – the alarm loop is monitored and the resistance is in normal range.

"Disarmed" - the alarm loop is not monitored.

"Arming delay" – the arming delay has not yet been elapsed.

"Intrusion alarm" – the detector breaking has been fixed.

"Arm Failed" – the alarm loop was broken when arming.

The intrusion alarm loop is considered as broken if its resistance has been out of 2…6 KOhm range when arming or having been armed, or resistance jump more than 10% when the loop is armed. The breaking of the armed loop leads this one to the "Intrusion Alarm" status.

The type 4 alarm loop resolving time is 70 ms.

The compatibility of loop resistance and the corresponding status can be shown at the Table 5.

The diagram of connection burglary detector to the type 4 alarm loop is contained into the Appendix C.

The type 5 is the burglary alarm loop with tamper check.

The alarm loop includes burglary detector with normally closed contacts and tamper detector.

The alarm loop statuses can be:

"Armed" – the alarm loop is monitored and the resistance is in normal range.

"Disarmed" - the alarm loop is not monitored.

"Arming Delay" – the arming delay has not yet been elapsed.

"Intrusion Alarm" – the detector breaking has been fixed.

"Arm Failed" – the alarm loop was broken when arming.

"Tamper Alarm" – the loop being disarmed, the tamper has actuated.

When alarm loop is armed the detector actuation (opening of its burglary contact) or tamper actuation switches the loop to the "Intrusion Alarm" mode. When alarm loop is not armed (being in statuses "Disarmed", "Arm

delay" or "Arm failed") tamper actuation switches the loop to the "Tamper Alarm" status.

The type 5 alarm loop resolving time is 70 ms.

The compatibility of loop resistance and the corresponding status can be shown at the Table 5.

The diagram of connection burglary detector with tamper check to the type 5 alarm loop is contained into the Appendix C.

The type 6 is the auxiliary alarm loop.

The auxiliary alarm loop is intended to control the door status in gas fire extinguishing systems, to control the status, actuations and operability of extinguishing equipment and to control the detectors or other equipment independent from burglary or fire alarming. The detectors or devices with "dry contact" output (normally opened or closed), or with "open collector" output are included in alarm loop of this type.

The alarm loop statuses can be:

"Aux Zone Alarm";

"Aux Zone Restore".

If the alarm loop resistance has come out of 2…6 kOhm range for more than 300 ms the loop has entered the "Aux Zone Alarm" status. The loop resistance having been within 2…6 kOhm range for more than "The Alarm Loop Recovery Time" sec, the loop has entered the "Aux Zone Restore" status. The auxiliary alarm loop is impossible to disarm, it is monitored permanently. Having received the arming/disarming command the panel generates the current loop status message.

Alarm loop status having been changed, the corresponding messages are sent to the net controller ("S2000"/"S2000-M" console or "ARM Orion"). These messages are not storied in non-volatile panel memory. So if during net controller disconnection several status changes had occurred then when connection recovering either only one message would be sent to the net controller or no messages would be sent if the current status is equal the last sent one.

Auxiliary alarm loop being associated with a relay, it failure blocks up the relay turning on assigning to the 1-8, 11, 12, 33, 34, 35 programs (see 1.5.1 section of this Manual). This feature can be used, for example, for creating the gas fire extinguishing system with launch blocking dealing with opened door to the protected premises.

The compatibility of loop resistance and the corresponding status can be shown at the Table 5.

The connection of normally opened or normally closed detectors and other controlled "dry contact" circuits to the type 6 alarm loop is identical to the connection of burglary detectors to type 4 loop (see Appendix C).

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The type 7 is the entering alarm loop.

All types of burglary detectors, including opening or closing, powerless or power supplied via alarm loop or separately are included into the type 7 alarm loop.

The alarm loop statuses can be:

"Armed" – the alarm loop is monitored and the resistance is in normal range.

"Disarmed" - the alarm loop is not monitored.

"Arming Delay" – the arming delay has not yet been elapsed.

"Entry Alarm" – the loop breaking has been fixed.

"Intrusion Alarm" – after having entered "Entry Alarm" status the "Intrusion/Fire Delay" period has expired.

"Arm Failed" – the alarm loop was broken when arming.

The performance and parameters of entering alarm loop are identical to those of type 4 burglary alarm loop, except that breaking of armed loop transits it at first to the "Entry Alarm", and only if during the "Intrusion/Fire Delay" period arming or disarming of the alarm loop had not occurred it would enter to the "Intrusion Alarm" status.

While the alarm loop is in the "Entry Alarm" status the relay switching by means of executive programs 1 – 8 and 12 does not perform.

This type alarm loop resolving time is 70 ms.

The compatibility of loop resistance and the corresponding status can be shown at the Table 5.

The diagram of connection burglary detectors to the type 7 alarm loop is contained into the Appendix C.

The type 11 is the alarming loop.

The alarm loop includes normally opened and normally closed alarm devices (call points, footboards and so on).

The alarm loop statuses can be:

"Armed" – the alarm loop is monitored and the resistance is in normal range.

"Disarmed" - the alarm loop is not monitored.

"Arming Delay" – the arming delay has not yet been elapsed.

"Silent Alarm" – attack, the alarm loop breaking has been detected.

"Arm Failed" – the alarm loop was broken when arming.

The alarming loop is considered as broken if its resistance is out of 2…6 kOhm range. When breaking in armed status the alarming loop enter the "Silent alarm" status. This status is indicated only by inner panel LED 1-4 and influences the relay controlled by means of 10 program ("Alarm output 1") or 16 program ("Alarm output 2") with relay being opened. The inner

audible sounders of panel and reader don't make sounds and reader LED don't change it status.

This type 11 alarm loop resolving time equal 300 ms.

The compatibility of loop resistance and the corresponding status can be shown at the Table 5.

The diagram of connection call points and other alarm annunciators to the type 11 alarm loop is contained into the Appendix C.

The type 12 is the programmable auxiliary alarm loop.

This type alarm loop can be used to control the variety of equipment, among them the devices not dealing with burglary or fire alarming.

The detectors or devices with "dry contact" output (normally opened or closed), or with "open collector" output are included in alarm loop of this type. The programmable auxiliary alarm loop can have up to 5 various statuses that are defined by loop resistance. One can program both statuses and the corresponding threshold resistance values. In so manner the equipment having several statuses and associated output contact groups can be monitored by means of one alarm loop if groups are in-cluded into alarm loop along with additional or shunt resistances. Moreover one can control short or open failures of this loop.

Audible and light alarming and the influence of this loop to the relay are defined by the statuses this alarm can have.

Status changing of the programmable auxiliary alarm loop depends only on the alarm loop resistance changing and is not defined by any loop parameters or arming/disarming commands.

The resolving time in case of status changing is equal to 300 ms. If alarm loop is entering "Armed", "Disarmed", "Aux Zone Restore" or one of recovering statuses then the transition is considered as completed in "The Alarm Loop Recovery Time" seconds.

The programmable auxiliary alarm loop is impossible to disarm, it is monitored permanently. Received the programmable auxiliary loop arm-ing/disarming command the panel generates the current loop status mes-sage.

Programmable auxiliary alarm loop status having been changed, the corresponding messages are sent to the net controller ("S2000"/"S2000-M" console or "ARM Orion"). These messages are not storied in non-volatile panel memory. So if during net controller disconnection several status changes had occurred then when connection is recovered either only one message would be sent to the net controller or no messages would be sent if the current status is equal the last sent one.

1.4.1.2 Arming Delay

The parameter "**Arming Delay**" means the "exiting duration" or the number of seconds you want the panel to wait before arming the alarm loop after having received the corresponding command. Nonzero "Arming Delay" is normally used for entering alarm loop in case of after entering arming command it is possible for some time to break this loop without going off an alarm. If before loop arming it is necessary to turn relay on (the executive program 17 "Turn on for a given time before arming") then the "Arming delay" loop parameter has to be set to a nonzero value. Otherwise the relay will not turn on because of the turning time for this program must not exceed the "Arming delay" loop parameter.

1.4.1.3 Intrusion/Fire Delay

For entering alarm loop (type 7) the "**Intrusion/Fire Delay**" parameter means the transition delay from "Entry Alarm" to "Intrusion Alarm" status and is considered as "entering duration". "Intrusion/Fire Delay" is given to make it possible to disarm alarm loop after entering loop breaking.

For entering alarm loop (types 1, 2, 3) the "Intrusion/Fire Delay" parameter means the period of loop transition from "Fire prealarm" to "Fire alarm" status. Alarm loops with double actuation recognition (types 1 and 3) can transit to the "Fire alarm" status when second fire detector in this loop has actuated. If "Intrusion/Fire Delay" is set to 255 s it means unlimited delay when the panel does not enter to the "Fire Prealarm" status due to the time conditions. In this case type 1 or 3 alarm loop can enter the "Fire Alarm" status only along with second loop detector actuation, but type 2 alarm loop can not enter the "Fire Alarm" status under any conditions.

1.4.1.4 Non-disarming

The parameter "**Non disarming**" prohibits loop disarming. This parameter is used to prevent fire or alarming loop incident disarming. If alarm loop is entering "Intrusion Alarm", "Silent Alarm", "Fire Prealarm", "Fire Alarm" or "Arm Failed" statuses then arming and disarming of the alarm loop will lead to attempt to arm this loop ("ALARM RESET"). As a result the alarm loop will enter the "Armed" status (the loop resistance is within the normal range) or the "Arm Failed" status (the alarm loop is broken).

1.4.1.5 Auto Rearming When Disarmed

When the alarm loop has entered the "Arm Failed" status (the loop was broken when arming) and if the parameter "**Auto Rearming When Disarmed**" is set for this alarm loop then the alarm loop will automatically enter the "Armed" state when it resistance will be in normal range.

1.4.1.6   Auto Rearming when Fire/Alarm

When the alarm loop has entered the "Intrusion Alarm", "Silent Alarm" or "Fire Alarm" statuses and the parameter "**Auto Rearming When Fire/Alarm**" is set then the alarm loop will automatically enter the "Armed" state when it resistance will be in normal range during "The Alarm Loop Recovery Time" period.

1.4.1.7   To Control When Disarmed

The parameter "**To Control When Disarmed**" makes the panel to control alarm loops in all statuses including "Disarmed". If the alarm loop resistance is in normal range the message "Ready to Arm" is sent for net controller, if not the panel sends the "Not Ready to Arm" message for the net controller. The resolving time for "Not Ready to Arm" is 300 ms and for "Ready to Arm" is equal to the "The Alarm Loop Recovery Time".

1.4.1.8   The Alarm Loop Recovery Time

"**The Alarm Loop Recovery Time**" is used when making the decision about loop having been recovered in case of "Auto Rearming when Fire/Alarm", or transition to "Aux Zone Restore" status, or transition of disarmed auxiliary loop to the "Aux Zone Restore" status.

1.4.1.9   Relay 1 and Relay 2 Control

The parameters "**Relay 1 Control**" and "**Relay 2 Control**" are associated the alarm loop with the panel relays. If relay 1 or/and relay 2 state must be influenced by the alarm loop then the corresponding parameter must be set otherwise it must be turned off.
If relay 1 or relay 2 must be controlled depending on the loop partitions status in accordance with the assigned program given by "S2000"/"S2000M" or "ARM Orion" (in case of centralized control) then parameters "Relay 1 Control" and "Relay 2 Control" have to be turned off even though this alarm loop is included to the partition affecting upon the panel relay.

1.4.1.10 Relay 1 and Relay 2 Control Delays

If the alarm loop status changing is to lead to the relay switching in accordance with the executive relay programs then turning relay 1 or 2 on (off) takes place not at once but after some "**Relay 1 Control Delay**" or "**Relay 2 Control Delay**" period given for this alarm loop. For the executive programs 9, 10, 13, 14, 15 and 16 (see the Table 7) these parameters are ignored and relays switches straight after the alarm loop status having been changed.

1.4.1.11 Scheduled Arming and Disarming

The parameters "**Scheduled Arming**" and "**Scheduled Disarming**" turn loop auto arming and disarming on at the given time. To give the time of auto arming or auto disarming the parameter "Time Window for scheduled arming/disarming" is used.

At a moment when the "Time Window For Scheduled Arming/Disarming" has been active the loop is disarmed (if "Scheduled Disarming" is on). When the "Time Window For Scheduled Arming/Disarming" has been finished the loop disarming is tried on.

Scheduled Arming and Disarming are enabled only in networking operation mode of the panel as a part of "Orion" system, with the panel date and time being synchronized.

If during the alarm loop arming it resistance is less than normal value, for example, if the smoke fire detector has actuated at the alarm loop, then the panel automatically resets this loop, that is, de-energizes all loops for 3 sec. In addition the panel resets the loop after the first normally opened (smoke) detectors actuation at the alarm loop of type 1 or type 2.

1.4.1.12 Loop Analysis Delay after Reset

The "**Loop Analysis Delay after Reset**" parameter enables to include the detectors with long warm-up time (or long reading time) in the alarm loop. If the loop power supplied detectors enters to the operational mode (and requires higher current consumption) during long time after loop resetting than it is necessary to set the "Loop analysis delay after reset" parameter to the value just over maximum warm-up time of loop included detectors.

1.4.1.13 Common Zone

The "**Common Zone**" parameter enables auto disarming of loop when any other associated alarm loop has been disarmed. Moreover it enables auto arming of loop when all associated alarm loops has been armed. Except the "Common Zone" parameter the parameter "The List of Associated Alarm Loops" is defined for the alarm loop.

If the "Common Zone" parameter is set for the alarm loop then this loop arming and disarming depend on the arming and disarming of the related loops. If at least one of the related loops has been disarmed then the present loop is disarmed too. If all related loops have been armed then this loop enters the armed status. It is not possible to change the common zone status by arming/disarming via RS-485 interface or with the help of identifiers. If alarm loop from common zone has the "Intrusion Alarm" status the arming/disarming command leads to the arming of this loop ("ALARM RESET" status).

Table 5: Loop parameters depending on the status

Loop type	Alarm loop statuses				
1 **Fire Smoke with double actuation recognition**	**Loop trbl short** (alarm loop short circuit)	**Fire alarm** (Actuation of two or more smoke detectors)	**Fire prealarm** (Actuation of one smoke detector)	**Loop trbl rst** (Loop has been restored after any failure)	**Loop trbl open** (alarm loop open circuit)
	less then 100 Ohм	from 150 Ohм to 1,56* кOhм	from 1,1* to 2,0 кOhм	from 2,4 to 5,4 кOhм	above 6,6 кOhм
		* Depending on detector stand-by mode consumed current			
2 **Fire Combined (smoke and heat)**	**Loop trbl short** (alarm loop short circuit)	**Fire alarm** (Actuation of smoke detector)	**Loop trbl rst** (Loop has been restored after any failure)	**Fire prealarm** (Actuation of heat detector)	**Loop trbl open** (alarm loop open circuit)
	less then 100 Ohм	from 150 Ohм to 1,8 кOhм	from 2,2 to 5,4 кOhм	from 6,6 to 30 кOhм	more than 50 кOhм
3 **Fire Heat**	**Loop trbl short** (alarm loop short circuit)	**Loop trbl rst** (Loop has been restored after any failure)	**Fire prealarm** (Actuation of one heat detector)	**Fire alarm** (Actuation of two or more heat detectors)	**Loop trbl open** (alarm loop open circuit)
	less 1,8 кOhм	from 2,2 to 5,4 кOhм	from 6,6 to 11 кOhм	from 12,5 to 30 кOhм	more than 50 кOhм
4 **Burglary**	**Loop trbl rst**		**Intrusion alarm**		
	from 2,2 to 5,4 кOhм		less than 1,8 кOhм, or more than 6,6 кOhм, or more than 10 % hop off		

Loop type	Alarm loop statuses				
5 **Burglary** **with tamper check**	**Loop trbl rst**	**Intrusion alarm**		**Tamper alarm**	
	from 2,2 to 5,4 кhОм	less than 1,8 кОhм, or more than 6,6 кОhм (in "Armed" status)		from 6,6 кОhм to 9,0 кОhм or more than 20 кОhм (in "Armed", "Arm delay" or "Arm failed" statuses)	
6 **Auxiliary**	**Aux zone restore**		**Aux zone alarm**		
	from 2,2 to 5,4 кОhм		less then 1,8 кОhм or more than 6,6 кОhм		
7 **Entering**	**Loop trbl rst**		**Entry alarm**		
	from 2,2 to 5,4 кОhм		less then 1,8 кОhм or more than 6,6 кОhм, or more than 10 % hop off		
11 **Alarming**	**Loop trbl rst**		**Silent alarm (attack)**		
	from 2,2 to 5,4 кОhм		less then 1,8 кОhм or more than 6,6 кОhм		
12 **Auxiliary Programmable**	**Status 1***	**Status 2***	**Status 3***	**Status 4***	**Status 5***
	less then R1*	from R1* to R2*	from R2* to R3*	from R3* to R4*	more than R4*
	* - alarm loop statuses and threshold resistances are programmable				

1.4.2 Loop arming and disarming

Fire (types 1, 2 or 3) alarm loops, burglary (types 4, 5 and 7) alarm loops and entering (type 11) alarm loops are able to be armed or disarmed as follows:

– With the help of Proximity card or Touch Memory key assigned by user code controlling this loop arming/disarming (local control);

– By the arming/disarming command from net controller via RS-485 interface (centralized control);

– Scheduled arming/disarming (auto control);

– Common zone arming/disarming in case of arming/disarming of related loops (auto control);

– Auto rearming when disarmed (auto control);

– Auto rearming when fire/alarm (auto control).

If the loop "Non-disarming" parameter is set on then this loop can not be disarmed. When arming/disarming command for non-disarming loop has been received through RS-interface:

− If been armed this loop retains it status and sends the message "Armed" to the net controller;

− If been in "Alarm", "Fire Alarm" or "Arm Failed" statuses this loop is armed and enters the "Armed" status in case of normal resistance value or in "Arm Failed" statuses otherwise.

For arming/disarming with the help of Proximity card or Touch Memory key it is necessary to program this key or card with the "User Code" attribute and the list of arming/disarming available loops (see 1.13.1).

When the identifier is presented to the reader all loops controlled by this identifier are armed if they all have "Disarmed" status, or are all disarmed otherwise.

The combined (using for arming/disarming and for access control) identifiers in standard mode are used for access control. To arm or disarm with the help of this identifier one has to switch the reader to the "Arming/Disarming Readiness" mode. To do this press the "Arming Request" button (the button closes the "D0" circuit to the "GND" circuit) and hold more than 1 s until the reader LED flashes. Instead of "Arming Request" pressing one can close two Touch Memory reader terminals for the same time and after that during 30 s reader light pulsing the combined identifier will be considered as arming/disarming one. The "Arming/Disarming Readiness" mode operates only for one reading and switches off after presenting the identifier, or after 20 s, or in case of repeated "Arming Request" button pressing (reader terminals closing).

If there are access blocking armed alarm loops (the access control parameter "Armed loop access blocking" is on) then when presenting of the combined identifier without "Arming/Disarming Readiness" mode switching on the loop will be disarmed and the access will be gained simultaneously (if identifier authority level are enabled to disarm access blocking alarm loops). So it is necessary to switch the "Arming/Disarming Readiness" on only when arming by means of combined identifier, with disarming being realized after first combined card access gaining.

Arming/disarming by means of combined identifier is possible without "Arming/Disarming Readiness" mode transit. For this purpose one should give non-zero value for the "Combined Identifier Holding Time" reader parameter. If the combined identifier is presented to the reader and is held for some time then the corresponding alarm loops are armed or disarmed. Short-time presenting of combined identifier leads to access gaining, with relay turning on and access gaining message generation being realized with some delay after identifier disappearing. This arming/disarming method can be used only for Touch Memory interface reader.

If "Combined Identifier Holding Time" is set to zero then the method mentioned above is disabled and the panel gains the access instantly after combined identifier presenting.

The arming/disarming can be realized by the corresponding commands sending via RS-485 interface from PC, "S2000"/"S2000M" console or one of the safety system "Orion" devices using the partition arming/disarming mechanism. Moreover to control fire and burglary alarm system one can use "S2000-4" panel (see section 1.9).

1.5   Relays

The panel relays can be controlled by one of the following ways:

- Local control in accordance with the assigned executive program depending on the connected alarm loop status.
- Centralized control by means of commands sent by net controller via RS-485 interface.
- Turning relays on/off for a given time while accessing process.

1.5.1   Relay local control

To control the relay depending on connected alarm loop status it is necessary to:
- assign the relays with the corresponding loops by means of "Relay 1 Control" and "Relay 2 Control" loop parameters;
- give the "Relay 1 Control Delay" and "Relay 2 Control Delay" loop parameters;
- assign the "Relay Control Program" and "Relay Control Time" relay parameters for relay 1 and relay 2.

The "Relay Control Program" parameter defines the relay behavior depending on the related loop statuses. All available executive programs are represented in Table 7.

The "Relay Control Time" parameter gives the period of time required by executive programs with the limited duration.

Except the programs №№ 9, 10, 13, 14, 15, 16 (see Table 7) all other programs support the delayed relay turning on/off for time interval given by "Relay Control Delay" parameter for the corresponding loop. So different panel alarm loops associated with the same relay can be given by different starting delays.

For executive programs from 1 to 8, 11, 12, 33, 34, 35 the relay assigned auxiliary loop (type 6) breaking blocks up the relay turning on. If when auxiliary loop recovering the turning on condition depending on the other loops are retained then for the programs 1, 2, 5, 6, 12 and 33 the relay switching on will be resumed, but for the programs 3, 4, 7, 8, 34 and 35 the switching will not be on. Thus, the auxiliary loop breaking holds the time

unlimited programs along with programs 11 and 33 and cancels time restricted programs along with programs 12, 34 and 35.

If the panel loops are assigned with the relays then control commands via RS-485 interface will be ignored and the local relay control will be in use.

1.5.2   Relay centralized control

To control the relays via RS-485 interface it is necessary to:

- Turn off the "Relay 1 Control" and "Relay 2 Control" loop parameters
- Define the executive program with the corresponding initial relay status (turned on or off)
- Assign this relays with the corresponding partition in the net controller configuration, define the executive program, give the control delay and the control time

In case of relays being not assigned with the loops the "Relay Control Program" parameter defines only the initial status of relay, that is the status which relay will be set to under the power turning on until the first centralized command will be received. Usually the programs with "turned off" initial statuses are used, for example, the program 1 "Turn on".

After the power turning the centralized control command can be received after some time so if centralized command supposes the turned on initial statuses it makes sense to switch relay on immediately after power turning on. In such a case it is necessary to give the relay any executive program assuming the initial turned on status, for example, the program 2 "Turn off".

1.5.3   Turning relay on/off during access controlling

When the access control is in use it is necessary to give the "**Relay Controlling Program**" and the "**Relay Control Time**" for the relay 1.

The "Relay 1 Controlling" loop parameter defines if the relay 1 turns on or not during access controlling.

Only the executive programs 3 ("On for a time") and 4 ("Off for a time") are available.

The executive programs 3 ("On for a time") is used for electromechanical locks or latches controlling. Initially the relay is off but in case of access gaining the relay is turning on (closing) for a given time.

The executive programs 4 ("Off for a time") is used for electromagnetic locks or latches controlling. Initially the relay is on but in case of access gaining the relay is turning off (opening) for a given time.

The "Relay 1 Control Time" parameter defines the maximum turning on (off) time when access gaining. The actual relay 1 control time when access gaining can be less or equal to the pointed time (see "Turn Relay 1

Off When Door Is Opening" and "Turn Relay 1 Off When Door Is Closing" access control configuration parameters).

If access control is in use then relay 1 assignment with the panel loops and relay control commands through the RS-485 interface are ignored.

1.5.4 The relay configuration parameters

Table 6: Relay configuration parameters

Parameter name	Description	Available range	Default values (when delivered)	
			Relay1	Relay 2
Relay Control Program	Defines the relay control method depending on the related loop statuses, the initial relay status and the relay 1 control method during the access control	1…37	3 "On for a time"	10 "Alarm output 1"
Relay Control Time	The switching on or off period for the executive programs with restricted operating time	from 1 to 8192 s in increments of 1/8 s	100	0

The "**Relay Control Program**" parameter defines the relay control method realized via loops (local control), or relay 1 control method during the access control, or initial relay status from power supply turning on to the first receiving of the control command via RS-485 interface (centralized control). All available executive programs are shown in the Table 7.

The "**Relay Control Time**" parameter gives the switching on or switching off period for the executive programs requiring the limited operating time.

Table 7: Relay executive programs

Number	Program name	Program description
1	'On'	If 'Intrusion alarm' or 'Fire alarm' then ON; else OFF.
2	'Off'	If 'Intrusion alarm' or 'Fire alarm' then OFF; else ON output.
3	'On for a time'	If 'Intrusion alarm' or 'Fire alarm' then ON for a given time; else OFF

Number	Program name	Program description
4	'Off for a time'	If 'Intrusion alarm' or 'Fire alarm' then OFF for a given time; else ON
5	'Blinking. Normal state OFF'	If 'Intrusion alarm' or 'Fire alarm' then blink (0,5 s ON and 0,5 s OFF); else OFF
6	'Blinking. Normal state ON'	If 'Intrusion alarm' or 'Fire alarm' then blink (0,5 s ON and 0,5 s OFF); else ON
7	'Blinking for a time. Normal state OFF'	If 'Intrusion alarm' or 'Fire alarm' then blink (0,5 s ON and 0,5 s OFF) during given time; else OFF
8	'Blinking for a time. Normal state ON'	If 'Intrusion alarm' or 'Fire alarm' then blink (0,5 s ON and 0,5 s OFF) during given time; else ON
9	'LAMP'	If 'Fire alarm' then blink (0,25 s ON and 0,5 s OFF) If 'Fire prealarm' then blink (0,25 s ON and 0,75 s OFF) If 'Intrusion alarm', 'Entry alarm' or 'Arm failed' then blink (0,5 s ON and 0,5 s OFF) If "Fire trouble" then blink (0,25 s ON and 1,75 s OFF) If there is at least one armed loop then ON If all loops are disarmed then OFF
10	'Alarm output 1'	If all relay assigned loops are armed then ON (close output) else OFF (open output)
11	'ASPT'	If at least two relay assigned loops have entered the 'Fire alarm' status and there are no broken auxiliary loops then ON for a given time The breaking of an auxiliary loop blocks switching on If the auxiliary loop has broken during the relay control delay then when recovering the output will be turned ON for a given time (the auxiliary loop breaking holds the turning on delay counting) Else OFF

Number	Program name	Program description
12	'SIREN'	If 'Fire alarm' then blink for a given time (1,5 s ON and 0,5 s OFF) if 'Fire Prealarm' then blink for a given time (0,5 s ON and 1,5 s OFF) if 'Intrusion alarm' then ON for a given time else OFF
13	'Fire output'	If 'Fire alarm' or 'Fire prealarm' then ON (close output) else OFF (open output)
14	'Output FAULT'	If there are loops having the statuses "Fire trouble", "Disarmed" or "Arm failed" then switches output OFF (opens) else ON (closed output)
15	'Fire LAMP'	In case of 'Fire alarm' switches in interrupted mode (0,25 s ON and 0,25 s OFF) In case of 'Fire prealarm' switches in interrupted mode (0,25 s ON and 0,75 s OFF) In cases of 'Intrusion alarm', 'Entry alarm' or "Arm failed" switches in interrupted mode (0,5 s ON and 0,5 s OFF) In case of 'Fire trouble' switches in interrupted mode (0,25 s ON and 1,75 s OFF) If all associated loops are armed switches output ON else OFF
16	'Alarm output 2'	If all associated loops are armed or disarmed then turns output ON else turns OFF
17	'Turn on for a given time before arming'	During arming delay period turns ON for a given time otherwise OFF
18	'Turn off for a given time before arming'	During arming delay period turns OFF for a given time otherwise ON
19	'Turn on for a given time when arming'	If at least one loop is armed switches the relay ON for a given time else OFF
20	'Turn off for a given time when arming'	If at least one loop is armed switches the relay OFF for a given time else ON

Number	Program name	Program description
21	'Turn on for a given time when disarming'	If at least one loop is disarmed switches the relay ON for a given time else OFF
22	'Turn off for a given time when disarming'	If at least one loop is disarmed switches the relay OFF for a given time else ON
23	'Turn on for a given time if arming has failed'	If at least one loop is in the state 'Arm has failed' switches the relay ON for a given time else OFF
24	'Turn off for a given time if arming has failed'	If at least one loop is in the state 'Arm has failed' switches the relay OFF for a given time else ON
25	'Turn on for a given time when auxiliary alarm'	If at least one loop is in the state 'Auxiliary alarm' switches the relay ON for a given time else OFF
26	'Turn off for a given time when auxiliary alarm'	If at least one loop is in the state 'Auxiliary alarm' switches the relay OFF for a given time else ON
27	'Turn on when disarmed'	Turn the relay ON if at least one assigned alarm loop is disarmed else OFF
28	'Turn off when disarmed'	Turn the relay OFF if at least one assigned alarm loop is disarmed else ON
29	'Turn on when armed'	Turn the relay ON if at least one assigned alarm loop is armed else OFF
30	'Turn off when armed'	Turn the relay OFF if at least one assigned alarm loop is armed else ON
31	'Turn on when auxiliary alarm'	In case of 'Auxiliary alarm' turns the relay ON else OFF
32	'Turn off when auxiliary alarm'	In case of 'Auxiliary alarm' turns the relay OFF else ON
33	'ASPT-1'	If the alarm loop has entered the 'Fire alarm' status and there are no broken auxiliary loops then switches the relay ON for a given time If an auxiliary loop has broken during the relay

Number	Program name	Program description
		control delay then when recovering the output will be turned ON for a given time (the auxiliary loop breaking holds the turning on delay counting)
34	'ASPT-A'	If at least two assigned alarm loops have entered the 'Fire alarm' status and there are no broken auxiliary loops then switches the relay ON for a given time In case of broken auxiliary loop the switching has blocked and the relay has remained OFF even after loop recovering
35	'ASPT-A1'	If there is alarm loop having 'Fire alarm' status and there are no broken auxiliary loops then switches the relay ON for a given time In case of broken auxiliary loop the switching has blocked and the relay has remained OFF even after loop recovering
36	"Turn on with temperature increasing"	If an alarm loop has entered "High temperature" status*, that is, the temperature has exceeded "temperature high" threshold then switches ON else OFF
37	"Turn on with temperature decreasing"	If an alarm loop has entered "Low temperature" status*, that is, the temperature has exceeded "temperature low" threshold then switches the relay ON else OFF
Remark* Only programmable auxiliary alarm loop (type 12) can enter the statuses "Temperature High" or "Temperature Low" and only if these statuses were programmed for this loop			

1.6 Access control

The panel is intended to be used for door access control, with the entering to the access-controlled area being identifier-protected and exiting being performed by pressing "EXIT" button.

The Touch Memory or Proximity card reader is mounted in front of the door into the protected area, the "EXIT" button being placed indoors.

The "EXIT" button and door opening detector (if used) are included into the first panel alarm loop in accordance with the connection diagram

being contained to the appendix C. The parameter "Loop Type" has to be selected as "Burglary" (type 4) or "Entering" (type 7).

The relay 1 in this case is used to control electromagnetic lock. To control the electromechanical lock the executive program 3 is used ("On for a time"), but for electromagnetic lock control it should select the program 4 ("Off for a time"). The parameter "Relay 1 Control Time" defines the maximum period of relay being turned on (off) when access providing. The relay binding with loops and external control commands (apart from the access control commands) are ignored.

If the presented identifier (Proximity card or Touch Memory keys) is registered in the panel memory then the "S2000−4" panel resolves if the access will be gained on base of key authority level, current access mode and key access violation presence. This is the local control process.

If the presented identifier is not registered in the panel memory then it will be transmitted to the net controller (ARM "Orion") which has to come to a decision about access granting or prohibiting. This centralized control is possible if the panel operate as a part of the safety system controlled by PC.

"Access" attributed keys being written into the "S2000-4" panel memory can be access limited by the following factors:

- date and time, if the time window for this key access is not active (see 1.7 section);

- key validity period, if it has elapsed or has not yet begun;

- in "Access Closed" mode when access blocking alarm loops are armed, or access is closed by RS-485 interfaced command or by special Closing key (see section 1.6.2).

If the electromagnetic lock or latch being in use is connected to the same power supply as the device then it should be supplied by separate wire. It is recommended to supply the electromagnetic locks by separate power source.

If the electromagnetic lock design is not provided with the scheme of suppression of high voltage pulse appearing during the commutation it is necessary to connect the lock terminals in parallel with the reverse directed diode, with direct diode current available being no more than 1 A.

1.6.1 Access control configuration parameters

The configuration parameters dealing with the access control process are shown in Table 8.

Table 8: Access control configuration parameters

Parameter		Description	Range	Default value
Access Control		Access control is in use	On / Off	Off
Door Opening Detector		Door opening detector is connected	On / Off	Off
"Passed" Event		To form the "Passed" event	On / Off	Off
Door Burglary Control		To control the unauthorized door openings	On / Off	Off
Door Blocking control		To control the time the door having been opened	On / Off	On
Door Blocking Time Out		Available duration of the door having been opened	1 ... 255 s	30 s
Turn Relay 1 Off When Door Is Opening		Pre-schedule interrupt of relay 1 opening program when incomer have opened the door	On / Off	On
Turn Relay 1 Off When Door Is Closing		Pre-schedule interrupt of relay 1 opening program when incomer have closed the door	On / Off	Off
Access Zone Number		The number of the access zone with entering controlled by the panel (being used as a part of the system)	0…65535 (65535 means zone undefined)	65535
To Deny Access if Any Pointed Loop Is Armed	loop1	The list of access denying alarm loops any being armed ("Or" denying)	On / Off	On
	loop2			On
	loop3			On
	loop4			Off
To Deny Access if All Pointed Loops Are Armed	loop1	The list of access denying alarm loops all being armed ("And" denying)	On / Off	Off
	loop2			Off
	loop3			Off
	loop4			Off

The parameter **"Access Control"** activates the access control functions of the panel. If this parameter is off the access control is not realized, with the first loop being of any type and the first relay being controlled by loops with the help of any programs local or centralized.

Further let's suppose the "Access Control" parameter to be set on.

The "**Door Opening Detector**" parameter setting on indicates the usage of the door opening detector. In such a case:

- After access gaining the panel is waiting for the door opening (passing) within "Relay 1 Control Time"**,** but no less then 10 s. Until the door having been opened or until the "Relay 1 Control Time" expired the new identifier presentation is not considered by the panel

- in case of door having been opened the panel can generate the "Passed" event

- the door can be controlled against burglary and blocking (see "Door Burglary Control" and "Door blocking control" parameters)

- the relay 1 control the lock can turn off before the "Relay 1 Control Time" having expired (see "Turn Relay 1 Off When Door Is Opening" and "Turn Relay 1 Off When Door Is Closing" parameters).

The parameter "Door Opening Detector" being turned off, the mentioned functions are enabled, the passing is not waited and reader LED indicates the fact of access gaining during "Relay 1 control Time" but no less than 2 s.

If the parameter ""**Passed**" **Event**" is set on then during door opening after access gaining the panel generate the message about the passing. This report can be needed for "Net Anti-Passback" function or "Time-and-Attendance" recording when using under "Orion" system.

If the parameter **"Door burglary control"** is set on then in case of door opening without access gaining the alarm message "Door Forced" is generated and light and sound signaling goes off.

If the parameter **"Door blocking control"** is set on then in case of door being opening within period exceeding the "Door Blocking Time Out" the alarm message "Door Left Open" is generated and light and sound signaling goes off.

The parameter "**Turn Relay 1 Off When Door Is Opening**" being set on, the turning relay 1 on (off) when access gaining interrupts just after the door having been opened before the "Relay 1 Control Time" elapsing.

The parameter "**Turn Relay 1 Off When Door Is Closing**" being set on, the turning relay 1 on (off) interrupts just after incomer has closed the door. This parameter used to be set in case of electromagnetic lock being controlled with the help of executive relay 1 program "Выключить на время".

If one of "Turn Relay 1 Off When Door Is Opening" and "Turn Relay 1 Off When Door Is Closing" is set on then the "Relay 1 Control Time" defines the maximum time period for passing. The actually time of turning on(off) shall be less or equal to "Relay 1 Control Time".

"**Access Zone number**" is important in case of the system "Orion" operation mode важен when using Anti-Passback or Time-and-Attendance functions. It is the number of access zone in the system the panel to gain access when identifier reading. This number is displayed by the panel in connection with the passing event and access gaining/denying. If the panel is used as a part of the system but Anti-Passback or Time-and-Attendance functions are not in use it should retain the default value of this parameter being equal to 65535. Passing events with such of access zone number are not retranslated to the other devices.

Local access by means of "S2000-4" panel recorded the panel are armed.

If the access blocking is required in case of arming any from the pointed loops one must include these loops to the list of "**To Deny Access if Any Pointed Loop Is Armed**" parameter.

If the access blocking is required in case of only **all** pointed loops arming one must include these loops to the list of "**To Deny Access if All Pointed Loop Are Armed**" parameter.

1.6.2   Access modes

The panel can have one access mode from three available ones:
- "Normal"
- "Access closed"
- "Access opened"

In "Normal" access mode the access is gained for such identifiers (keys) which are recorded to the panel database, have the "Access" attribute, are not blocked, have no expired key validity period and have no time zone offences.

The panel enters the "Access closed" mode in such a case:

- arming of the loops blocking access

- special Closing key presenting

- net controller command via RS-485 interface.

If the access is closed by Closing key or command then reader LED enters the interrupted red light mode with the 1 Hz frequency and short pauses. In such a case the access is closed for all panel recorded keys.

It the access is closed by reason of blocking access loops being armed then in case of combined key having disarming this loops privileges presenting the loops are disarmed and access is gained simultaneously. For other keys either for access only or combined without blocking loops disarming privileges the access is prohibited.

Access closing because of loops is removed by means of blocking loops disarming.

If the access has closed by Closing key or RS-485 interfaced command then "Normal" mode recovering is realized either by repeated presenting of Closing key or by Opening key presenting or by net controller command via RS−485 interface.

The "Access Opened" mode entering is realized by Opening key presenting or by net controller command via RS−485 interface. It is accompanied by reader LED green interrupted lighting with the 1 Hz frequency and short pauses. In this mode the access is free and any identifier presenting is not required.

In "Access Opened" mode the corresponding relay is given by the panel opening action permanently so that the relay is continuously turned on (off). Therefore this mode must not be used for several type devices that cannot be powered all time.

The "Normal" access mode recovering is realized either by repeated presenting of Opening key or Closing key presenting or by net controller command via RS−485 interface.

1.7   Double identification

The panel reader can realize the specific operational mode when to identify the person it is necessary to present two identifiers instead of one, e.g., Proximity card followed by PIN code. Such a mode is called as double identification and to enter it the "Double Identification" parameter shall be set.

If the parameter "Double Identification" is set, this mode will be used not only for access and arming/disarming keys but for special keys (MASTER, Opening, Closing).

The double identification procedure begins with the presenting of the first identifier or "Main Code". If this key is recognized the panel enters to the mode of waiting for the second identifier, or "Extra Code", and the reader light indicator blinks with green color and 5 Hz frequency. For half a minute it is necessary to present the extra identifier.

If the second identifier presented is not coincided with extra code then the message "Illegal Code" with the "Extra Code Error" attribute is generated.

If the extra code presented is correct then the identification procedure is considered as successful and the panel executes such action the presented key is assigned to (access gaining, alarm arming/disarming, key programming mode entering or access opening or closing.

If the identification procedure needs to be simplified for some keys when all other keys have to be double identified one can set "Without Extra Code" for given keys. To identify with the help of such keys it is enough to present only main key without extra one.

Since in case of double identification the panel is to store two codes for each user (main and extra) then the maximum "S2000-4" panel storage capacity is only up to 1024 codes.

Main and extra codes are presented to the same reader so the combining of different code types, for example Proximity card + PIN-code, is possible only in case of using of integrated devices providing different type identifier reading and transmitting to the panel using unified format (Touch Memory, Wiegand or ABA TRACK II).

1.8   Time windows

The panel time windows are used to:

- limit the access into the protected premises depending on date, weekday and time of day;

- limit the assigned arming/disarming authority depending on date, weekday and time of day;

- arm and disarm alarm loops automatically at the given time.

To add the access time restrictions each key is assigned with the number of access time window. To restrict arming/disarming authorities the key is assigned with the number of arming/disarming time window.

The assigning with "0" number time window means the absence of date, time or weekday limitations. Time window parameters with the numbers from 1 to 16 are programmed by the panel.

The time window descriptor consists from the list of 10 time intervals and the list of red-letter days for one year.

The time interval description comprises the beginning hours and minutes, the finishing hours and minutes and activity attribute for all weekdays and red-letter days.

The red-letter day list allows to redefine the weekday for a year or to declare any day as red-letter. If the day is not redefined in the red-letter day list (black-letter day) than this weekday corresponds to the calendar day. If the day is redefined the calendar is ignored and the panel consider this day in accordance with the red-letter day list. Redefined weekday can take the following values: 1 (Monday), 2 (Tuesday),   7 (Sunday), 8 (Eighth Timetable Day),   14 (Fourteenth Timetable Day), "Red-letter Day". The last value "Red-letter Day" is designed to simplify the comprehension of the list and is not distinct from the other values. It can be called as the "Fifteenth Timetable Day".

So the red-letter day list allows to:
– Declare any day as red-letter day, that is the day with time intervals unlike intervals given for other weekdays are active

– Set weekdays aside (e.g., Saturday can be redefined as Monday
– Program complex sliding access timetables with the period less or more than 7 days
– Program complex access timetables without return period.

One can mention two typical ways of creating the red-letter list.

The first way. If the employer access timetable (or working timetable) is assigned with the calendar week (for example, the days from Monday to Friday are black-letter and the Saturday and Sunday are red-letter days) then the most og days are not redefined. Some days are marked as "Red-letter Day", or redefined in case of setting aside, or redefined to values more than 7 if the special access time intervals are to be in use in such a days.

The second way. One can create the complex and sliding access timetables (or working timetables) not attached to the calendar week. In such a case all days in the list are given by "weekday" directly (are redirected).

To restrict the access or to arm/disarm depending on the date and the time or key validity period the internal panel clocks have to be synchronized. It is supplied automatically when the panel operates as a part of safety system "Orion" based on PC or "S2000M"/"S2000"ver.1.20 or above. In stand-alone panel operation mode the access and arming/disarming time restrictions or scheduled arming/disarming are out of use.

If the parameters "Scheduled Arming" and "Scheduled Disarming" are set for any alarm loop then in the moment when the "Arming/ Disarming Time Window" time interval (see Table 17) has been active the loop is disarming. But in the moment when this time interval has been over the loop is attempted to arm. Scheduled arming and disarming doesn't disable other ways of alarm loop arming and disarming.

1.9 Centralized access and partition control

If the panel operates as a part of security system "Orion" it can work with identifiers registered by net controller (with the proper privileges) but not recorded to the panel database. Such identifiers can be used for centralized control only if the system is controlled by "ARM Orion". And they can be used for partition arming/disarming if the system is controlled by "ARM Orion" or "S2000"/"S2000M" console.

Like local the centralized keys can be combined for access gaining and arming/disarming both. More over the local access gaining can be integrated with the centralized partition control for keys being recorded to the panel database with the "Access" attribute.

If unknown identifier is presented to the panel connected reader its code is transmitted to the computer or console. The reader light indicator is switching from red to green alternately with the 5 Hz frequency until the computer or console response has been received. It can takes from a fraction up to a few seconds depending on the number of devices being connected to the RS-485 interface.

If the net controller decides to gain the access the centralized access is available along with the local one.

If the key presented is assigned with the partition control privileges then the reader LED displays the current partition status accordingly to the Table 9. The second presenting of this key leads to arming of disarmed partition or to disarming at any other case. Each subsequent identifier presenting causes the action contrary to preceding one, that is, if the second presenting has resulted in partition disarming then the third presenting results in partition arming. If the key privileges are limited, for example, only arming is permitted then the repeated and all followed presenting results in only allowed operation (arming in this case) regardless of the current partition status.

Table 9: Partition status representation

Partition status	Reader LED mode	Light color
"Disarmed"	Turned off	-
"Armed"	Turned on	Yellow (green + red)
"Alarm", "Fire Alarm", "Fire Prealarm", "Arm Failed"	Blinks with 2 Hz frequency	Yellow
"Fire Trouble" (in fire partition)	Short flashes with 1 s regularity	Yellow

If the identifier presented is not recognized by the net controller or it has not access authority then the panel indicates the access denying, that is, the panel and reader sounders makes the long audible signal "Error", but reader LED blinks three times and then is red lit continuously.

If when presenting the unknown key the panel is not communicated with the computer then the message "Illegal Code" is generated. This message along with the other ones is storied into the panel non-volatile memory and is to be transmitted to the computer when the communication has been recovered.

If the combined key (for centralized access and partition control or for local access and partition control) is presented then the access is gained.

To control the partition by means of this key it is necessary previously to switch the panel mode to the "Arming/Disarming Readiness" mode identically to the loop arming/disarming local control combined keys using (see section 1.4.2.

The communication between the panel and the net controller being absent, the centralized access and partition control are impossible.

When centralizes access and partition control are in use the double identification is not supported.

1.10 Reader connection

To read off the identifier codes it is necessary to connect the reader with Touch Memory, Wiegand or ABA TRACK II (magnetic card) interfaces to the panel. One can use any identifier such as Touch Memory keys, Proximity labels, cards or tags, magnetic cards, PIN-codes and so on designed for readers transmitting the identifier code to the panel in one of the mentioned above interface formats. The panel terminals designation can be shown in the Table 10.

Table 10: "S2000-4" terminals designation for reader connection

Terminal		Input or output	Designation
D0	Touch Memory mode	Input/Output	Reader data
	Wiegand mode	Input	Reader "D0" data
	ABA TRACK II mode	Input	Reader "DATA" data
D1	Touch Memory mode	-	Is not in use
	Wiegand mode	Input	Reader "D1" data
	ABA TRACK II mode	Input	Reader "CLOCK" tick
LEDG		Output	Reader green LED controller
LEDR		Output	Reader red LED controller
BEEP		Output	Reader sounder controller

The reader is connected by coupling the terminals listed above with the reader contacts of the same name. The readers having the useful current above 100 мА or being located far from the panel (50 m or farther) then to supply them one must use the separate wire pair connected to the power supply directly.

If the reader is supplied separately the "GND" terminal (minus of reader power) must be connected to the "GND" contact of "S2000−4".

The reader having sole unicolored LED, it control circuit is connected to the "LEDG" contact of the panel in case of reader being used only for access control. If the reader is used for loop arming/disarming only and access control is not in use then the unicolored LED control circuit has to be connected to the "LEDR" contact of the panel "S2000-4".

The reader having not sounder control input or sounder is not required then the "BEEP" contact of the "S2000-4" retains nonworking.

Some reader connection examples can be referred to at the Appendix E.

The reader configuration parameters are presented in Table 11.

Table 11: Reader configuration parameters

Parameter	Description	Range	Default value
Reader interface type	The way of transmitting of the read identifier code to the panel	1 - Touch Memory 2 – Wiegand 3 - ABA TRACK II	1 (Touch Memory)
Arming/ Disarming Combined Key Holding Time	The time of holding the combined key (card) near the reader for loop arming/disarming (only for Touch Memory interfaced readers)	0…32 s	0 (Off)
Double Identification	Two identifiers are presented for recognition	On / Off	Off
LED Control Polarity	The active logic level choice for reader LED lighting	Direct (active "1") / reverse (active "0")	Direct (active "1")

Parameter		Description	Range	Default value
Reader LED Standby Mode		Describe the reader LED lighting in standby mode	1 - Off 2 - if any given loop is armed then LED is red lit, otherwise is off 3 - if all given loops are armed then LED is red lit, otherwise is off 4 – red lighting	2
Loop Arming Reader Light Indication	**1**	The list of alarm loops which arming results in red reader LED turning on (for 2 and 3 "Reader LED Standby Mode"	On / Off	On
	2		On / Off	On
	3		On / Off	On
	4		On / Off	Off
Loop Alarm Reader Light Indication	**1**	The list of alarm loops which breaking is indicated by reader LED	On / Off	On
	2		On / Off	On
	3		On / Off	On
	4		On / Off	On
Sound Control Polarity		The active logic level choice for reader sounders going off	Direct (active "1") reverse (active "0")	Direct (active "1")
Reader Sound Indication	**Access**	Reader sound signaling of access gaining/denying, alarms and entering into the programming mode	On / Off	On
	Alarms		On / Off	On
	Programming		On / Off	On

The "Reader Interface Type" (Touch Memory, Wiegand or ABA TRACK II) parameter has to agree with the interface of the readers being in use.

The Touch Memory interfaced reader being used, the "Arming/Disarming Combined Key Holding Time" parameter allows to control loop arming and disarming with the help of combined key without previously panel switching to the "Arming/Disarming Readiness" mode. To arm/disarm the loop one shall hold the key near the reader for this time. To

gain the access one shall present the combined key to the reader for short time, actual relay being switched on in the moment of removing the key from the reader.

By default when the "S2000-4" panel has just been delivered the "Arming/Disarming Combined Key Holding Time" parameter is set to zero so that such a way of loop arming/disarming is off, with combined card access being gained instantly when the key is presented not when removed.

The "Double Identification" parameter setting means that to recognize the same person it is necessary to present two identifiers instead of one (see the section 1.7).

The "LED Control Polarity" parameter defines the active logic level for reader red and green LED control. If the **direct** polarity is given then the LED switching on is realized by logical "1" level issue to the "LEDG" and "LEDR" contacts of the panel. If the **reverse** control polarity is given then the LED switching on is realized by logical "0" level issue.

In standby mode the reader LED can be either always turned off, or turned on (with the red lighting), or indicates the certain alarm loops being armed (the LED is lit) or disarmed (the LED is not lit). It is defined by "Reader LED Standby Mode" parameter and the list of alarm loops which "Loop Arming Reader Light Indication" parameter is on.

The "Loop Alarming Reader Light Indication" parameter defines the list of loops which breaking are indicated by reader LED.

The "Sound Control Polarity" parameter defines the active logic level for reader sounder control similarly to the LED control polarity.

The reader sound indication parameters allow sounder going off for each signal categories (see section 1.11).

1.11 Light and sound signaling

The panel uses the internal light indicators (LED) and internal sounder along with light and sound reader indicators to communicate system information to you.

The messages signaled by panel "READY" light indicator are described in Table 12.

Table 12: Panel "READY" indicator lights

Event or status	Message description
Operating mode	Light indicator is on
Power supply trouble (supply voltage is out of range)	Indicator blinks with the 2 Hz frequency
MASTER key programming	Indicator blinks in "Time spaced short

Event or status	Message description
	double flashes" mode
Access keys programming	Indicator blinks in " Time spaced short flashes" mode
Loop arming/disarming keys programming	Indicator blinks in "Time spaced short double flashes" mode
Access keys and arm-ing/disarming (combined) keys programming	Indicator blinks in " Time spaced short triple flashes " mode
"Test operation" mode	Indicator blinks with the 5 Hz frequency

The messages signaled by reader light indicator are described in Table 13.

Table 13: Reader indicator lights

Panel status		Light operating mode	Lighting
Standby mode, that is, no alarms and normal access mode	" Reader LED standby mode " is **1** (off)	Off	-
	"Reader LED standby mode" is **2** or **3** (loop arming indication)	On if the loop is armed otherwise is off	Red
	"Reader LED standby mode " is **4** (red light)	On	Red
Fire Alarm		Blinks in "Short stop-ping" mode with 1 Hz frequency	Red
Fire Prealarm		Blinks in "Flashing" mode with 1 Hz fre-quency	Red
Intrusion Alarm or Entry Alarm		Blinking with the 2 Hz frequency	Red
Trouble (Loop Trbl Open or Loop Trbl Short)		Blinks in "Short flash-ing" mode with o,5 Hz frequency "	Yellow (green + red)
Tamper Alarm (detector tamper opening in type 5 loop)		Blinking with the 2 Hz frequency	Red

Panel status	Light operating mode	Lighting
Aux Zone Alarm	Blinking with the 2 Hz frequency	Yellow (green + red)
Arm Failed	Blinking with the 2 Hz frequency	Green
Access Closed	Blinks in "Short stopping" mode with 1 Hz frequency	Red
Access Free Mode	Blinks in "Short stopping" mode with 1 Hz frequency	Green
Access Granted, the passing is waiting	On	Green
The extra code is waiting (after main code having been presented in case of double identification)	Blinking with the 5 Hz frequency	Green
Access Denied	Three flashes blinking with the 3 Hz frequency	Red
The unknown key is presented, the net controller verdict is waiting	Switches from red to green with 5 Hz frequency	Red/ Green
Partition centralized control, partition being armed	On	Yellow (red + green)
Partition centralized control, partition being disarmed	Off	-
Partition centralized control, partition alarm	Blinking with the 2 Hz frequency	Yellow (red + green)
Partition centralized control, partition trouble	Flashes with 1 Гц frequency	Yellow (red + green)
Access keys programming	Red and green flashes alternately	Red and green alternately
Arming/Disarming Keys Programming	Two red and two green flashes alternately	Red and green alternately

Panel status	Light operating mode	Lighting
Arming/disarming and access combined keys programming	Three red and three green flashes alternately	Red and green alternately
MASTER key programming	Two red and two green flashes alternately	Red and green alternately
Note: loop alarming ("Fire Alarm", "Fire Prealarm", "Intrusion Alarm", "Entry Alarm", "Loop Trbl Short", "Loop Trbl Open", "Tamper Alarm", "Aux Zone Alarm", "Arm Failed") is indicated only if "Loop Alarm Reader Light Indication" is enabled for this loop		

The messages signaled by internal panel light indicators are described in Table 14.

Table 14: Panel indicator lights *"1" - "4"*

Loop status		Light operating mode	Lighting
Disarmed		On	Green
Armed		On	Red
Arming Delay	Loop is normal	On	Green
	Loop is broken	Blinking with the 2 Hz frequency	Green
Arm Failed		Blinking with the 2 Hz frequency	Green
Fire Alarm		Blinks in "Short stopping" mode with 1 Hz frequency	Red
Fire Prealarm		Blinks in "Flashing" mode with 1 Hz frequency	Red
Intrusion Alarm, Entry Alarm, Silent Alarm, Aux Zone Alarm		Blinking with the 2 Hz frequency	Red
Trouble (Loop Trbl Open or Loop Trbl Short)		Blinks in "Short Flashing" mode with 0,5 Hz frequency	Yellow (green + red)
Tamper Alarm (detector tamper opening in type 5 loop)		Blinking with the 4 Hz frequency	Red

Loop status		Light operating mode	Lighting
Key pro-gramming	The key doesn't control the loop	Off	-
	The key has only arming authority	Blinks in "Flashing" mode with 1 Hz frequency	Red
	The key has only disarming authority	Blinks in "Flashing" mode with 1 Hz frequency	Green
	The key has arming and disarming authority both	Red and green flashes alternately	Red/Green

The messages signaled by reader and panel sounders are identical and are described in Table 15.

Table 15: *Panel and reader sounds*

Status or event	Category	Description
Standby mode	-	Turned off
Access is gained	Access	Two short sounds
Access is denied	Access	Long signal ("Error")
The main code is presented in case of double identification	Access	One short signal
Access opening by special key	Access	The sequence from short, two short and another two short signals ("Access Opened")
Access closing by special key	Access	Long signal followed by four short signals ("Access Closed")
The recovering of access normal mode by special key	Access	The sequence from two short, another two short and one more short signals ("Access Free Mode")
Fire	Alarm	The panel sounder operates in alternating tone mode (siren)
		The reader sounder operates in continuous mode with short pauses

Status or event	Category	Description
Fire Prealarm	Alarm	The panel sounder operates in the paused alternating tone mode (paused siren) The reader sounder operates in interrupted mode with 2 seconds period
Intrusion Alarm	Alarm	Sounder operates in interrupted mode with 1 seconds period
Entry Alarm	Alarm	Sounder operates in interrupted mode with 0,25 seconds period
Trouble (fire loop short or open failures)	Alarm	Short sounds with 2 seconds period
Tamper Alarm (tamper breaking in 5 type loop)	Alarm	Sounder operates in interrupted mode with 0,125 seconds period c
Door Forced	Alarm	Sounder operates in interrupted mode with 0,25 seconds period until the door having been closed
Door Left Open (The door has been opening more than "Door Blocking Time Out"	Alarm	Four short signals being repeated with some seconds period
Entering to the key programming mode	Program-ming	Three pairs of short sounds ("Pro-gramming")
Exiting from the key programming mode	Program-ming	Three short and long sounds ("Programming Finishing")
Entering to the MASTER key programming mode	Program-ming	The "MASTER Programming" melody
MASTER key has been programmed	Program-ming	The end of "MASTER programming" melody
Adding of new key or changing parameters of the existing key, the panel being in the key programming mode	Program-ming	Two short signals ("Key Recording Confirmation")
Presenting of the exis-tent key in the key pro-gramming mode	Program-ming	Short sound ("The key has been already recorded")

Any signal category can be disabled for both panel and reader sounder.

1.12 Configuration parameters

Following are the seven configuration parameter groups:
- system configuration parameters;
- loop parameters (see Table 4);
- relay parameters (see Table 6);
- access control parameters (see Table 8);
- reader configuration parameters (see Table 11);
- time window parameters (see the section 1.7);
- identifier configuration parameters (see Table 17).

System configuration parameters are shown in Table 16. Other configuration parameters are considered at the corresponding sections.

Table 16: System configuration parameters

Parameter		Description	Range	Default value
Net address		RS-485 interface net address	1…127	127
MASTER Programming Inhibit		The main MASTER key generation by means of the panel tamper detector is inhibited	On / Off	Off
PIN-code max length		The maximum number of PIN-code digits for readers with Wiegand interface transmitting the PIN-code to the panel one digit after one	1…12	6
Panel Sound Indica-tion	Access	Звуковая сигнализация в приборе о предоставле-нии/запрете доступа, тре-вогах и включении режима программирования ключей	On / Off	On
	Alarm		On / Off	On
	Program-ming		On / Off	On

"**Net address**" parameter is used for RS-485 communications. When having been connected to the "Orion" safety system the panel has to be assigned with net address.

The **" MASTER Programming Inhibit"** parameter turning on inhibits the procedure of programming the main MASTER key with the help of the panel tamper. In such a case the panel key recording is possible only from the computer or by means of previously generated MASTER keys.

If the Wiegand interfaced keypad transmitting the PIN-code to the panel one digit after one is used as a reader then the code entering is considered as completed when the number of digits entered has reached the "**PIN-code max length**" parameter. To complete the less codes entering press "#" button (code 0B hex) on the keypad.

All available panel sounds are divided into three categories such as **"Access"**, **"Alarm"** and **"Programming"** (see Table 15). The internal panel sounder going off is defined by the corresponding parameters status.

To change the configuration parameters use the "**uprog.exe**" program versions **4.0.0.810 or above**.

ATTENTION! Don't use the earlier versions of "**uprog.exe**" program or "S2000"/"S2000M" console for changing of the configuration parameters. The program "**uprog.exe**" runs under Windows-98 or above operational systems. To connect the panel to the COM-port use the interface converter such as "PI-GR", "S2000-PI", "S2000" console version 1.20 or above or "S2000M" console. The latest version of device configuring program **"uprog.exe"** along with the related information is available at the **www.bolid.ru**.

1.13 Identifiers

Identifiers such as Touch Memory keys, Proximity cards or PIN-codes can be used along with the "S2000-4" panel with the aim of:
- access gaining;
- alarm loop arming/disarming;
- partition arming/disarming;
- access opening and closing;
- other identifiers programming (recording into the panel memory).

The identifiers have to be recorded into the "S2000-4" panel memory except for identifiers used for partition control or centralized access which are recorded only into the net controller database.

1.13.1 Identifier parameters

Up to 2048 identifiers can be entered to the panel database. They can be Touch Memory keys, or Proximity cards, or PIN-codes. Each identifier has the parameter set (attributes), demonstrated by Table 17.

Table 17: *Identifier attributes*

Attribute	Description	Range
Key type	Defines the key destination	Basic MASTER Opening Closing
Blocking	The key is disabled (doesn't effects)	On / Off
Without Extra Code	To identify this key the extra code is not obligatory, double identification for other keys being required for other keys (see section 1.7)	On / Off
User key	Loop arming/disarming designated key	On / Off
Loop 1 Arming	The list of alarm loops which are available for arming by this key	On / Off
Loop 2 Arming		On / Off
Loop 3 Arming		On / Off
Loop 4 Arming		On / Off
Loop 1 Disarming	The list of alarm loops which are available for arming by this key	On / Off
Loop 2 Disarming		On / Off
Loop 3 Disarming		On / Off
Loop 4 Disarming		On / Off
Arming/ Disarming Time Window	The time window when arming and disarming are permissible	0 ... 16
Access	The key is designed for access	On / Off
Access Time Window	The time window when access is permissible	0 ... 16
Validity Restriction	Defines is there restrictions of key validity period or not	On / Off
Key Validity Period	The start and finish dates of the key validity	01.01.2000 ... ... 31.12.2255

The "Key Type" parameter defines the main designation of the given key.

Basic key is designed for access or loop arming/disarming.

MASTER key is designed for programming (or adding) of the new keys. The keys programmed with the help of MASTER key have Basic type.

Opening key is designed for access opening (access free mode) and normal access mode recovering (see 1.6.2).

Closing key is designed for access closing and normal access mode recovering (see 1.6.2).

The "Blocking" parameter setting on defines any type key prohibition. It is used for temporary key blocking (for example, in case of key loss) the recovery possibility being retained.

The "Without Extra Code" parameter simplifies several key identification in case of double identification using (see 1.7). If double identification is not realized this key parameter is ignored.

If the parameter "User Code" is set the key is used for loop arming and disarming. The parameters "Loop1 Arming" – "Loop4 Arming" and "Loop1 Disarming"-"Loop4 Disarming" gives the lists for arming and disarming accordingly.

The "**Arming/Disarming Time Window**" is the number of time window defining the time periods when loop arming and disarming are enabled. If it is equal to zero then arming and disarming are enabled at any time.

If the "**Access**" parameter is set the key is used for access control.

"**Access Time Window**" is the number of time window defining intervals for access gaining. If this parameter is set to zero the access is free at any time.

If the parameter "**Validity Restriction**" is set then the beginning and finishing time are given by "**Key Validity Period**" parameters. Otherwise the key has unrestrictive validity period. This parameter can be attributed to any type of key.

1.13.2 Identifier programming

The panel operating as a part of the "Orion" safety system based on PC, the Touch Memory, Proximity card, PIN-code or other identifier are entered into the panel non-volatile memory by means of ARM Orion Database Administrator software.

If the panel is operated in stand-alone mode or as a part of the "Orion" safety system controlled by "S2000" or "S2000M" console then the identifiers are entered (programmed) by means of **"uprog.exe"** program which is designed to add/delete keys, set or change their attributes, stores keys into a file, load key list from the file into the panel and so on.

In addition one can program the keys without PC by means of one or more so-called MASTER-keys. Any identifier given by MASTER type key attribute can be MASTER-key. The presenting of MASTER key turns on the key programming mode. In this mode all other presented keys are recorded to the panel memory with the type Basic and take over all MASTER-key parameters such as "Access", "User Code", "Loop Arming/Disarming List", "Access Time Window", "Arming/Disarming Time Window" and "Key Validity Period".

One MASTER-key can be programmed by panel itself without PC. To do this it is necessary to open the panel cover and gradually realize one long (more than 1,5 s), one short (less then 0,5 s) and one more long tamper pressing. The pauses between pressings must not exceed 0,5 s.

In such a case the panel and reader sounders make the "MASTER programming" melody. The Ready LED of the panel and reader LED synchronously blinks by twice flashes, with reader LED flushing twice by red and twice by green.

After that it is necessary within 30 s to present the identifier to be programmed. The panel and reader sounders will make the end of the "MASTER programming" melody, with the Ready LED and reader LED enter the continual mode.

Attention! The MASTER key programming with the help of tamper removes all keys having been recorded by the panel before. The MASTER key programming by means of **"uprog.exe"** program does not affect upon the keys programmed earlier.

If the programming key mode is entered with the help of MAIN MASTER key then the programmed key status can be changed by means of tamper. Long (more than 1,5 s) tamper pressing switches the "Access" and "User Code" attributes of the programming keys successively between the "only access", "only arming/disarming" and "Access and arming/disarming" (combined) values.

When the "User Code" attribute is set for the programmed key then tamper short pressing series changes the key loop arming/disarming privileges by successively switching between "arming and disarming", "only arming" and "does not control this loop" values.

One short tamper pressing changes loop 1 arming/disarming privileges, twice short tamper pressing changes loop 2 arming/disarming privileges and so on. The pauses between pressings in one series must not exceed 0,5 s.

The programming key status is indicated by the panel and reader LED in accordance with the Table 18.

Table 18: Programming key parameters displaying

Programming key status	Reader LED	Ready LED	1 ... 4 LED (display 1…4 loop arming privileges of the programming key)
Access key	Single red and green alternately flashes	Single flashes	Off
Loop Arming/ Disarming key	Two green flashes and two red flushes alternately	Twice flashes	Turned off if the key doesn't control given loop
Access and Loop Arming/ Disarming key (combined)	Three green flashes and three red flushes alternately	Trial flushes	Blinks by red when the key has only arming privileges. Blinks by green and red alternately when the key has given loop arming and disarming privileges

MAIN MASTER key can be added with the help of the computer. To do this the first key in the list must be attributed with the MASTER type.

The panel can record any number of MASTER keys but programming key attributes can be changed with the help of tamper only if programming mode entering is realized by MAIN MASTER key. Otherwise the programming keys succeed MASTER key attributes apart from key type and without editing feature.

If several MASTER keys assume to be used it is necessary to program them with the help of **"uprog.exe"** program.

To enter the programming mode of keys designed for arming/disarming or access it is necessary to present the MASTER key to the panel connected reader. The panel and reader sounders would make three double short sounds, with reader LED lighting alternately by red and green once, twice or trial (see the Table 18). In such mode the identifier presented are recorded to the panel memory with the MASTER key parame-

ters. If the MAIN MASTER key was used then the programming key parameters can be changed with the help of tamper.

If the MAIN MASTER key was used the programming key parameters can be edited by means of tamper. Twice short sound and 2 second longed reader LED green lighting when the identifier is presented mean that the new code has been entered to the panel or current key parameters have been changed. Single short sound and 1 second longed reader LED green lighting mean that such key with given parameters has already exist. The long sound and trial red blinking of reader LED mean the key entering failure (the memory is full).

If the panel uses double identification then after main code having been received the panel prompts to enter (or to present) extra code, with reader LED beginning to blink by green with 5 HZ frequency Гц. After that within 30 s it is necessary to present key or code to be written as extra for main one having been presented before.

To exit programming mode after adding and programming of the all the necessary keys one must present **the same** MASTER key that has switched the programming mode on. Moreover the key programming mode finishes automatically in case of no key presenting and no tamper pressing having occurred within 30 s. After programming mode exiting the panel and reader sounders make three short and one long sounds ("Programming Completed"), Ready LED lights in continuous mode and reader LED enters the standby indication mode.

Programming the keys without using of the computer has the following restrictions:
- It is impossible to program Opening, Closing and subordinate MASTER keys
- It is impossible to assign the key validity period to the programming key
- When double identification is in use it is impossible to program the key with "without extra code" attribute

In case of key programming with the help of **"uprog.exe"** program such restrictions are absent. Moreover any key can be removed or blocked. In addition the possibility of key text comments entering and storing in the memory remarkably simplifies the key list editing process.

2 APPLICATION

2.1   Preparation for use

2.1.1   Protective measures

There are no dangerous voltage circuits within the panel.

The mounting and maintaining of the panel shall be executed under power–off conditions.

2.1.2   The panel mounting

The panel can be mounted to the wall, or above the suspended ceiling, or to other places on premises being protected from atmospheric fallouts, mechanical damages and unauthorized access.

The installation procedure is as follows:

a)   attach the panel to the wall in any convenient place

b)   install the reader in front of the door to the protected premises or inside the premises if access control is not in use

c)   if the access control is in use place the "EXIT" button inside the premises

d)   attach the connecting wires in accordance with the "S2000-4" connecting diagram presented in Appendix B.

2.1.3   RS-485 interface wiring

To connect the panel with the net controller via RS-485 highway interface refer to the connecting diagram in appendix B and execute the following steps:

a) Connect the A and B lines of RS-485 highway interface to the "A" and "B" terminals of "S2000-4" panel

b) Connect the panel circuit "0V" to the similar circuits of preceding and following RS-485 connected devices (it is not obligatory if the devices are connected to the same power supply)

c) Delete XT3 jumper connecting the terminal 620 Ohm resistance to the interface circuit (except for the latest device). This jumper is located near the "A" and the "B" terminals of the "S2000-4" panel.

When wiring the RS-485 interface it should connect the devices to the chain. If it is necessary to make long RS-485 interface branch (longer than 50 m), for example, to reduce the cable length, it is recommended to use the interface repeater "S2000-PI". One can use no more than 10 repeaters (no more than 10 interface branches) in one RS-485 interface

segment. The number of in-series "S2000-PI" repeaters (the number of segments) is not restricted.

2.1.4   Changing the panel default settings

In networking operation mode the panel has to be assigned with the unique net address in the range from 1 to 127.

To assign the address connect the panel to the "S2000"/"S2000M" console or to the computer, with other devices being disconnected from the RS-485 interface. Being used the computer has to be connected with the panel through the RS-232/RS-485 interface converter such as "S2000-PI", or "PI-GR", or "S2000-USB", or "S2000"/"S2000M" console.

Then change the default address of "S2000-4" panel by means of "S2000"/"S2000M" console or **uprog.exe** program running from the computer.

To adjust the panel for the particular application and to gain full capability it is probably to change some configuration parameters with the help of **uprog.exe** program versions 4.0.0.810 or above (see 1.12 section).

In case of usage the panel along with the access identifiers it is necessary to record corresponding Touch Memory keys, Proximity cards, PIN-codes or other identifiers to the panel memory. For local access control, arming and disarming the identifiers have to be recorded to the panel memory in accordance with the 1.13.2 section of this manual, but for centralized access control, arming and disarming the identifiers have to be recorded into the net controller memory.

2.2   Typical application

2.2.1   Fire alarm system without access control at the small object

The purpose is light and sound alarming of fire at the small object.

Detectors in use are fire smoke detectors, fire heat detectors and fire manual call points.

Devices under control are light and sound annunciators.

Panel control algorithm is actuated loop rearming by means of Touch Memory key.

The configuration parameters have to be set in accordance with the Table 19.

Table 19: Configuration parameters

Parameter	Parameter value				Comment
	loop1	loop2	loop3	loop4	
Alarm loop type	2	2	3	2	The smoke detectors without additional resistors are included into the loops 1 and 2. Heat detectors are included into the loop 3 and manual call points (both normally closed or opened) are included to the alarm loop 4
Intrusion/ Fire Delay	0	0	0	0	To enter the "Fire Alarm" mode in case of one fire detector actuation bypassing the "Fire Prealarm" mode
Non-disarming	On	On	On	On	All loops are always armed. The arming command is used only for actuated alarm loop rearming
Auto Re-arming when Disarmed	On	On	On	On	If during rearming the alarm loop has not been restored ("Arm Failed" has occurred) then it will be automatically armed after loop having been recovered
Auto Re-arming when Fire/Alarm	Off	Off	Off	Off	The recovering of the "Armed" mode after "Fire Alarm" status is possible only by means of operator command (presenting of the loop arming Touch Memory key to the Touch Memory reader)
Relay 1 Control	On	On	On	On	Light annunciator ("Lamp") control
Relay 2 Control	On	On	On	On	Sound annunciator ("Siren") control
Relay 2 Control Delay	60 s	60 s	60 s	0 s	The 60 s delay is given to the user to rearm actuated loop without siren getting off in case of false detector actuation. The siren is gone off if the signal was received fron the manual call point
Relay 1 Control Program	15				The program "Fire LAMP" controls the external light annunciator
Relay 2 Control Program	12				The program "Siren" controls the external sound annunciator
Relay 2 Control Time	120 s				The maximum time of siren going off during the fire is 2 minutes

Access Control	Off	
Reader Interface Type	1 – Touch Memory	
LED Control Polarity	direct (active "1")	
Reader LED Standby Mode	3, that is if all given loops are armed than the indicator is red, otherwise is turned off	The reader LED repeats "Fire LAMP" tactic
Reader LED Loop Arming Indication	loop 1	On	LED is lit if all 4 alarm loops are armed
	loop 2	On	
	loop 3	On	
	loop 4	On	
Reader LED Loop Alarming Indication	loop 1	On	Any loop breaking is displayed by the reader LED
	loop 2	On	
	loop 3	On	
	loop 4	On	

In case of smoke detector actuation at the loop 1 or the loop 2, or heat detector actuation at the loop 3, or manual call point signal at the alarm loop 4 the panel enters the "Fire Alarm" mode, with:

- the panel LED of the corresponding loop and Touch Memory reader LED beginning to blink in " Short stopping" mode with 1 Hz frequency

- the panel sounder turning on with alternating tone mode (fire siren sound)

- the external light annunciator connected to the panel relay 1 turning on with the mode "0,75 s turned on and 0,25 s turned off"

- siren turning on delay counting beginning (if one of the loop1 – loop 3 actuating) or instant siren turning on (if the manual call point at the loop 4 is activating.

If during relay 2 control delay the loop arming programmed Touch Memory key is presented to the reader than the rearming of the breaking loop will be occur and the siren will not sound.

If the key is not presented then after control delay expiration the siren will be switched on.

After fire source (e.g., smoking) elimination the all actuated loops arming programmed key shall be presented to the reader. The panel will enter the standby mode.

2.2.2   Fire alarm system without access control at the large object

The purpose is fire alarm and smoke elimination from the part of the object (some adjacent premises, one floor, the part of the building and so on).

Detectors in use are fire smoke detectors, fire heat detectors and fire manual call points.

Devices under control are sound annunciator and smoke elimination system damper.

Panel control algorithm is arming and disarming by the command from "S2000"/"S2000M" console or computer supplied with "ARM Orion" software. The reader is not connected.

Sound notification control is centralized in case of any placed ignition, with "S2000"/"S2000M" console or "ARM Orion" control the second panel relay.

The common smoke elimination system turning on, sending of the "Fire" signal to the local Fire Department and another common system control are centralized, with "S2000"/"S2000M" console or "ARM Orion" controlling the "S2000-SP1" unit relays.

The configuration parameters have to be set in accordance with the Table 20.

Table 20: Configuration parameters

Parameter	Parameter value				Comment
	loop1	loop2	loop3	loop4	
Alarm loop type	1	1	3	2	The smoke detectors are included to the loop 1 and the loop 2, the heat detectors are included to the loop 3 and manual call points (both normally opened and closed) are included to the loop 4

Parameter	Parameter value				Comment
	loop1	loop2	loop3	loop4	
Intrusion/ Fire Delay	255	255	255	0	The "Fire Alarm" signal forming is realized only after two smoke or heat detector actuations at the same alarm loop, or manual call point activation
Non-disarming	On	On	On	On	All loops are armed. The arming command is used only for rearming of the actuated loop
Auto Rearming when Disarmed	On	On	On	On	If during rearming the alarm loop has not been restored ("Arm Failed" has occurred) then it will be automatically armed after loop having been recovered
Auto Rearming when Fire/Alarm	Off	Off	Off	Off	The recovering of the "Armed" mode after "Fire Alarm" status is possible only by means of operator command
Relay 1 Control	On	On	On	On	All loops control the smoke elimination system damper
Relay 2 Control	Off	Off	Off	Off	The sound notification control from the net controller by the "Fire Alarm" signal generated by the any device installed on premises
Relay 1 Control Delay	30	30	30	30	The damper control delay after "Fire Alarm" signal is 30 s
Relay 1 Control Program	1				"Turn on", the local dumper is opened from the "Fire Alarm" moment to the actuated loop rearming
Relay 2 Control Program	1				Defines the initial status of the relay (turned off). The relay 2 control tactics ("Siren") is given by the net controller
Access Control	Off				

The two smoke detectors at the loop 1, or two smoke detectors at the loop 2, or two heat detectors at the loop 3 being actuated or manual call point at the loop 4 being activated, the panel enters the "Fire Alarm" mode, with:

- the panel LED corresponding to this loop being blinking in short stopping mode with 1Hz frequency

- the panel sounder switching on the siren mode (alternating tone)

- the smoke elimination damper control delay (relay 1 control delay) beginning to count

- the "Fire Alarm" event message being transmitted to the net controller.

Having received this message the net controller ("S2000"/"S2000M" console) gives commands to switch on the sound alarming in all the building, including the turning on the panel relay 2, the delayed turning on the common smoke elimination system and commands to the relays controlling another common systems. The light and audible alarming of "S2000"/"S2000M" console is turning on too.

After the ignition or smoking cause elimination the actuated loop re-arming command is given from the "S2000"/"S2000M" console and the "S2000-4" panel enters the standby mode.

2.2.3 *Burglary and fire alarm without access control*

The purpose is the part of burglary and fire alarm system for the protection of two separate rooms and one common room (hall or waiting room).

Detectors in use are burglary, fire smoke and fire heat detectors.

Device under control is siren.

Panel control algorithm is burglary loops arming/disarming by means of Proximity cards, with the Proximity reader being installed outside the protected premises in front of the entrance.

Loop 1 is used for the common placement burglary alarming.

Loop 2 and loop 3 are used for the separate room burglary alarming.

Loop 4 is used for all premises fire alarming.

The configuration parameters have to be set in accordance with the Table 21.

Table 21: Configuration parameters

Parameter	Parameter value				Comment
	loop1	loop2	loop3	loop4	
Alarm Loop Type	4	4	4	2	Loops from 1 to 3 are burglary Loop 4 is fire combined
Arming Delay	0	0	0	0	The reader is located outside the protected premises. Arming delay is not required

Parameter		Parameter value				Comment
		loop1	loop2	loop3	loop4	
Auto Rearming when Disarmed		Off	Off	Off	On	
Relay 1 Control		Off	Off	Off	Off	Centralized sounder alarm control follows the "Fire" signal formed be any building device
Relay 2 Control		Off	Off	Off	Off	The relay 2 is not used
Common Zone		On	Off	Off	Off	
List of Associated Alarm Loops	1	-	No	No	No	Loop 1 is the common zone for loop 2 and loop 3
	2	Yes	-	No	No	
	3	Yes	No	-	No	
	4	No	No	No	-	
Relay 1 Control Program		1 ("Turn on")				Defines the initial relay status (turned off). The relay 1 control tactics ("Siren") is given at the net controller
Relay 2 Control Program		1 ("Turn on")				Defines the initial relay status (turned off). The relay is not used
Access Control		Off				
Reader Interface Type		1 – Touch Memory				Proximity reader with Touch Memory interface is used (for example, "S2000-Proxy")
LED Control Polarity		Direct (active "1")				
Reader LED Standby Mode		2, that is if any given loop is armed then LED is red lit, otherwise is off				Reader LED is on if at least one burglary loop is armed
Loop Arming Reader Light Indication	1	On				The reader LED indicates only the burglary loop arming. The status of loop 4 is not indicated
	2	On				
	3	On				
	4	Off				

Parameter	Parameter value				Comment
	loop1	loop2	loop3	loop4	
Loop Alarm Reader Light Indication	**1**		On			Any loop breaking is indicated by LED
	2		On			
	3		On			
	4		On			

To arm/disarm two sets of Proximity cards are used, with first set cards controlling the loop 2 arming and disarming and second set cards controlling the loop 3 arming/disarming. The loop 1 is armed and disarmed automatically as "Common zone" when Loop 2 or 3 arming. Loop 4 (fire) is controlled from the "S2000"/"S2000-4" console or PC when necessary.

Separate rooms arming/disarming is executed be presenting the corresponding card to the reader. If controlled by the card loop was armed it is disarmed (with reader light indicator being turned off). If controlled by the card loop was disarmed it is armed (with reader light indicator being turned on).

After latest separate placement arming (loops 2 and 3) the common placement (loop 1) is armed automatically.

Any separate placement disarming leads to automatically common placement disarming.

In case of breaking of armed loop the panel enters the "Alarm" mode, with:

- the panel LED corresponding to breaking loop and reader LED beginning to blink regularly with 2 Hz frequency

- the panel sounder turning on in interrupted mode with 2 Hz frequency

- the "Intrusion Alarm" event message being transmitted to the net controller ("S2000"/"S2000M").

Having received this message "S2000"/"S2000M" console gives light and audible alarm turning on command, with "S2000"/"S2000M" light and audible alarm turning on too.

In case of loop 4 fire detector actuation the panel enters the "Fire" mode, with:

- the corresponding panel LED beginning to blink in short stopping mode with 1 Hz frequency

- the panel sounder turning on in "Siren" mode (alternating tone)

- the "Fire Alarm" event message being transmitted to the net controller.

Having received this message "S2000"/"S2000M" console gives the command to turn on the light and audible alarming in all building including the panel relay 1 turning on, with "S2000"/"S2000M" light and audible alarm turning on too.

After the ignition or smoking cause elimination the loop 4 arming command is given from the "S2000"/"S2000M" console and the "S2000-4" panel enters the standby mode.

2.2.4 Burglary and fire alarm along with access control

The purpose is the burglary and fire alarm and protected premises access control as a part of safety system.

Detectors in use are:

- magnetic contact detector (door opening detector) in loop1,
- volumetric alarm detector and glass break detector in loops 2 and 3,
- fire smoke or heat detectors in loop 4.

Devices under control are the electromechanical latch in case of access control and the siren in case of fire.

Panel control algorithm is burglary loops arming/disarming by means of Proximity cards, with the Proximity reader being installed outside the protected premises in front of the entrance.

The configuration parameters have to be set in accordance with the Table 22.

Table 22: *Configuration parameters*

Parameter	Parameter value				Comment
	loop1	loop2	loop3	loop4	
Alarm Loop Type	4	4	4	2	Loops from 1 to 3 are burglary Loop 4 is fire combined
Arming Delay	0	0	0	0	The reader is located outside the protected premises. Arming delay is not required
Auto Rearming when Disarmed	Off	Off	Off	On	
Relay 1 Control	Off	Off	Off	Off	The relay 1 is used for electro-mechanical latch control and is not loop controlled
Relay 2 Control	Off	Off	Off	Off	Centralized sounder alarm control follows the "Fire" signal formed be any building device

Parameter		Parameter value				Comment
		loop1	loop2	loop3	loop4	
Relay 1 Control Program		3 ("Turn for a time")				To open the door it is necessary to supply latch voltage
Relay 1 Control Time		5 s				The maximum turning on time for electromechanical latch in case of access gaining
Relay 2 Control Program		1 ("Turn on")				Defines the initial relay status (turned off). The relay 2 control tactics ("Siren") is given at the net controller
Access Control		On				
Door Opening Detector		On				The door opening detector is connected
Door Burglary Detector		On				To control the door from the un-authorized opening
Door Blocking Control		On				To generate the "Door Left Open" event if the door is open-ing more than 30 s
Door Blocking Time Out		30 s				
To Turn Relay 1 Off when Door Is Opening		On				To remove supply voltage when the door has just been opened
To Deny the Access if Any Pointed Loop Is Armed	1	On				If burglary loops are armed the access is denied. The fire loop arming is enable.
	2	On				
	3	On				
	4	Off				
Reader Interface Type		1 – Touch Memory				The Proximity reader with Touch Memory interface is in use (for example, "Proxy-2A")
Arming/ Disarming Combined Key Holding Time		3 s				To arm it is necessary to hold the combined card near the reader for 3 s
LED Control Polarity		direct (active 1")				The signal polarity can be direct or reverse but has to agree with the defined reader polarity

Parameter		Parameter value				Comment
		loop1	loop2	loop3	loop4	
Reader LED Standby Mode		2, that is if any given loop is armed then LED is red lit, otherwise is off				Reader LED is on if at least one burglary loop is armed
Reader LED Loop Arming Indication	**1**	On				Any burglary loop arming is indicated by the reader LED but loop 4 arming is not indicated
	2	On				
	3	On				
	4	Off				
Reader LED Loop Alarm Indication	**1**	On				Any loop breaking is indicated by the reader LED
	2	On				
	3	On				
	4	On				
Sounder Control Polarity		Direct (active 1")				The signal polarity can be direct or reverse but has to agree with the defined reader polarity
Reader Sound Indication	**Access**	On				The reader sounder makes the short double sound in case of any access gaining or one long sound "Error" if the access is prohibited.
	Alarms	On				
	Programming	On				The reader sounder goes off in interrupted mode in case of "Alarm", "Fire Alarm", "Door Forced" or "Door Left Open"

To arm/disarm burglary loops and for access gaining the same Proximity cards are used (so-called combined cards). If the premises are armed then card presenting leads to burglary loops disarming accompanied with the access gaining. To arm the premises it is necessary to present and hold the card near the reader during 3 seconds. If apart from the combined cards access cards are in use then the access gaining is possible only when the object is disarmed, that is loops from 1 to 3 are disarmed.

The relay 1 control time gives the "Time for passing" when access gaining. During this time after access gaining the door is enabled to be opened. When door is opening the electromechanical voltage is removed

and being returning to the initial status the door has just been closed regardless of passing duration.

In the loops 1 – 3 "Intrusion Alarm" or loop 4 "Fire Alarm" the panel transmits the messages analogous those described in section 2.2.3.

3 MAINTENANCE

To make sure that the panel is in reliable working condition test it on receipt and once a year. The testing shall include:

- Visual inspection of the possible mechanical damage of the panel case

- Inspection of the panel mounting security and contacting wire and contact coupling statuses

- Functional testing of the panel efficiency identically with the section 3.1 of this manual

3.1   Panel testing

The purpose of this testing is the panel receiving inspection. The test includes the functional check with the aim of showing up possible defects and their operability status estimation. If the panel doesn't meet the requirements of the checking procedure described below then appeal to the manufacturer.

The panel shall be tested under the following ambient conditions:

- Temperature - $(25 \pm 10)\ ^{\circ}C$

- Relative humidity - (45 - 80) %

- Atmospheric pressure – (630 – 800) mm Hg

The "S2000-4" testing connection diagram is presented in the Appendix D. The operability status testing time is no more than 30 minutes.

Comments

The wire connection or disconnection when testing is realized under power-off conditions.

Take into account that technical readiness time of the panel can take up to 3 s.

Following are the testing steps:

a) Check the package consistency and unpack the device

b) Check up the delivery set in accordance with this manual (see section 1.3)

c) Make sure that the panel case is not mechanically damaged

d) Shake up the panel to make sure that foreign objects are absent inside the panel

e) Check up the terminal block attachments

f) Check up the conformity of the panel number and the release date with those specified by user's manual

3.1.1 Overall functional testing

a) Energize the panel

b) The internal sounder shall make "Turning on" sound

c) The panel useful current shall not exceed 200 мА

d) The "S2000"/"S2000M" console shall display the events occurred, such as panel detection, panel reset and panel tamper.

3.1.2 Testing in diagnostic mode

Before diagnosing disconnect all relay load circuits.

To run the diagnostic mode open the panel cover and press tamper three times for short time (0,1-0,5 s) and once hold for a time at least 1,5 s. The pauses between pressings shall be no more than 0,5 s.

The panel being useful, the "Ready" indicator and the reader light indicator enter the interrupted quick flashing light mode, with the reader light indicator switching red lighting to green, and the internal sounder making two beeps. Then the panel LED indicators 1 - 4 shall light one-by-one for short time with 0,5 s red and 0,5 s green light. The relay 1 contacts close in the moment of LED 1 and 2 lighting, but the relay 2 contacts close in the moment of LED 3 and 4 lighting.

3.1.3 Testing of the reader connection circuits

a) Present the key or card unregistered by the panel to the reader.

b) The reader light indicator shall light three times by red.

c) The internal panel sounder and the reader sounder if presented and controlled by the panel shall make long "Error" sound.

If the panel doesn't respond to the presented key or card it can mean the inconsistency between the data format and the "Reader interface Type" of reader (Touch Memory or 1 by default).

The absence of sound can mean that the "Access" typed signals are disabled for panel and reader sounders (enabled by default).

3.1.4 Alarm loop checking

a) The alarm loop being disconnected (terminal resistor being disconnected), measure the first alarm loop voltage. It shall be within the range from 26,5 to 27,5 V

b) Connect the terminal resistor 4,7 кОм to the "ШС1" and read the ADC value by means of "S2000"/"S2000M" as follows:

- Select the menu commands "Request INFO" and "Zone ADC" gradually

- Enter the panel address (the default value is 127) or select the panel descriptor from the list of connected devices with the help of "▲" and "▼" keys

- Enter the alarm loop number 1

The value given out shall be within the range from 46 to 50.
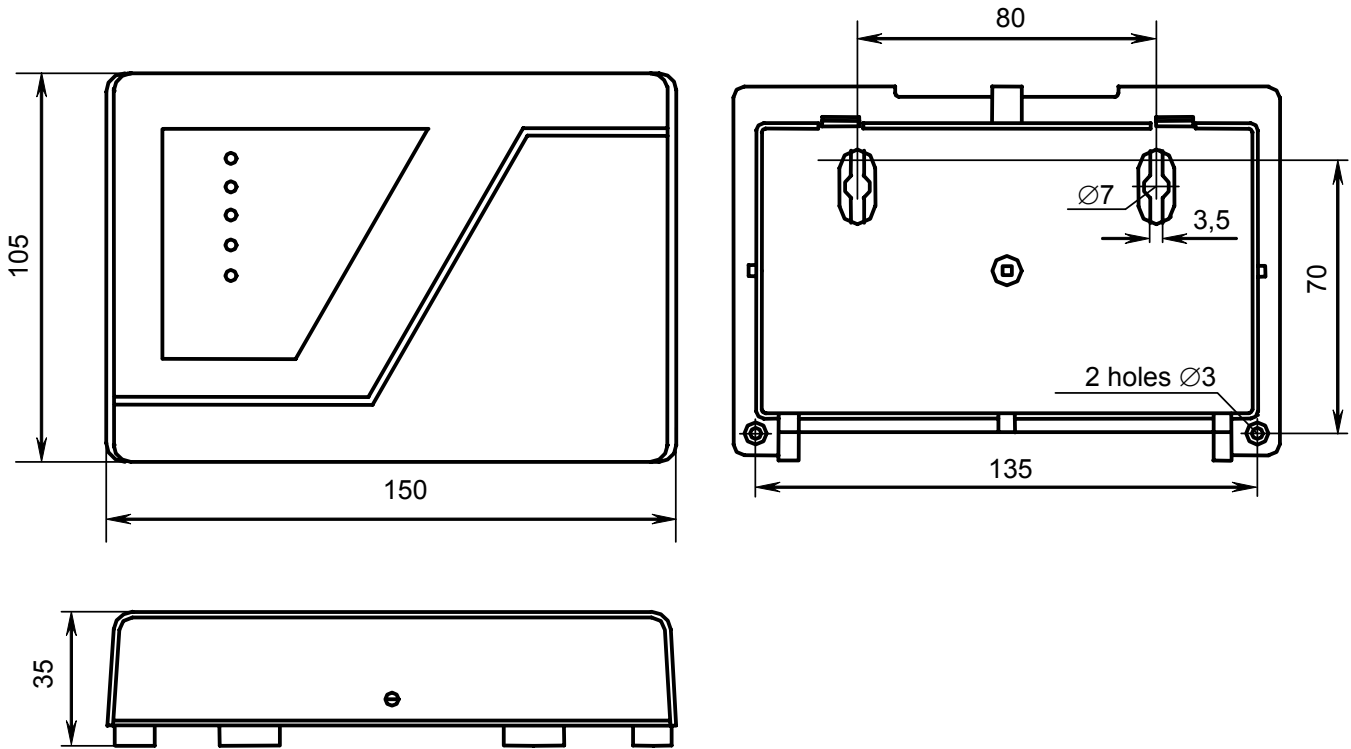
c) Repeat the steps from b) item for loop 2, loop 3 and loop 4.

4 STORAGE

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

The panel storage life in package has to be no more then 6 months.

Appendix A. "S2000-4" overall and mounting dimensions

All dimensions are defined in millimeters.

Appendix B. "S2000-4" connecting diagram

S2000-4

Proximity card reader   or   Touch Memory reader

XT1.1			XT1.2		
15	ШС 1+	loop 1	D0	5	D0
16	ШС 1-		D1	6	D1
17	ШС 2+	loop 2	LEDG	7	LEDG
18	ШС 2-		LEDR	8	LEDR
19	ШС 3+	loop 3	BEEP	9	BEEP
20	ШС 3-		GND	10	GND
21	ШС 4+	loop 4			+U
22	ШС 4-				

green — LEDG
red — LEDR

+12V(24V)   To the reader power supply unit
0V

XT1.3

| K1 | 11 |
| K1 | 12 |

+12V…14V   To the door lock power supply unit
0V

Electromagnetic lock

XT1.4

| K2 | 13 |
| K2 | 14 |

+12V(24V)   To the siren power supply unit
0V

Siren (or other sounder)

RS-485 (from the previous system device)
A B GND

XT1.5

B	4
A	3
+U	2
0V	1

RIP-12 (RIP-24)

| +12V(24V) |
| 0V |

A B GND

RS-485 (to the next system device)

Appendix C. Connection the detectors to the loops

Connection of normally opened (smoke) fire detectors to the type **1** alarm loop (fire smoke loop with double actuation recognition)
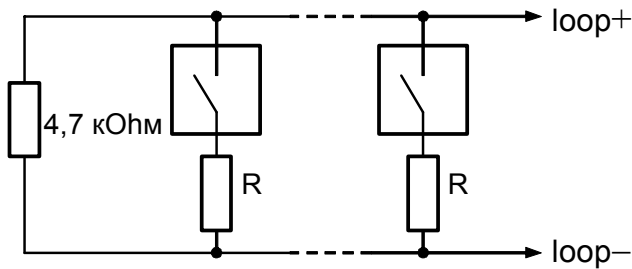
R = 1,5 кОм±5% for DIP-3SU, DIP-U (actuated detector voltage is from 7,5 V to 8,5 V)

R = 2,2 кОм±5% for 2100, 2151E (actuated detector voltage is from 4 V to 5 V)

R = 2,4 кОм±5% for IP-101A (actuated detector voltage is from 3,5 V to 4 V)

R = 3 кОм±5% for detectors with "dry contact" type output circuit

Connection of normally opened (smoke) and normally closed (heat) fire detectors into the type **2** (fire combined) alarm loop
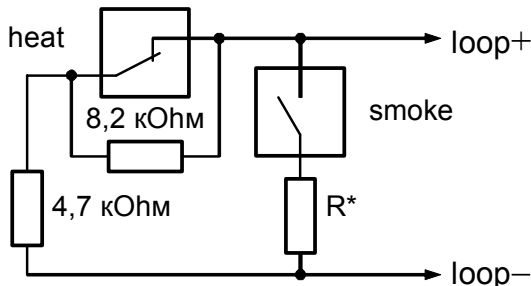
R* = 0 for DIP-3M, DIP-3SU, DIP-U, 2100, 2151E (actuated detector voltage is more than 4V)

R* = 510 Ом for IP-101A, IPR513-3 and for detectors with "dry contact" type output circuit (actuated detector voltage is less than 4V)

Connection of normally closed (heat) fire detectors into the type **3** (fire heat with double actuation recognition) alarm loop
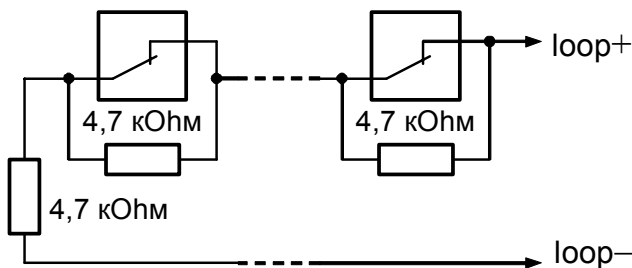
Connection of normally closed and normally opened burglary detectors to the type **4** (burglary), **7** (entering) и **11** (alarming) alarm loops
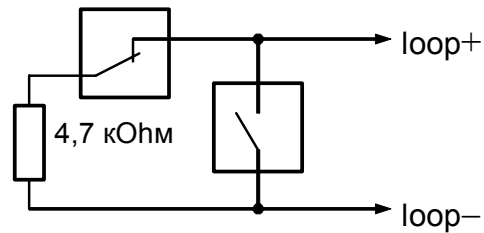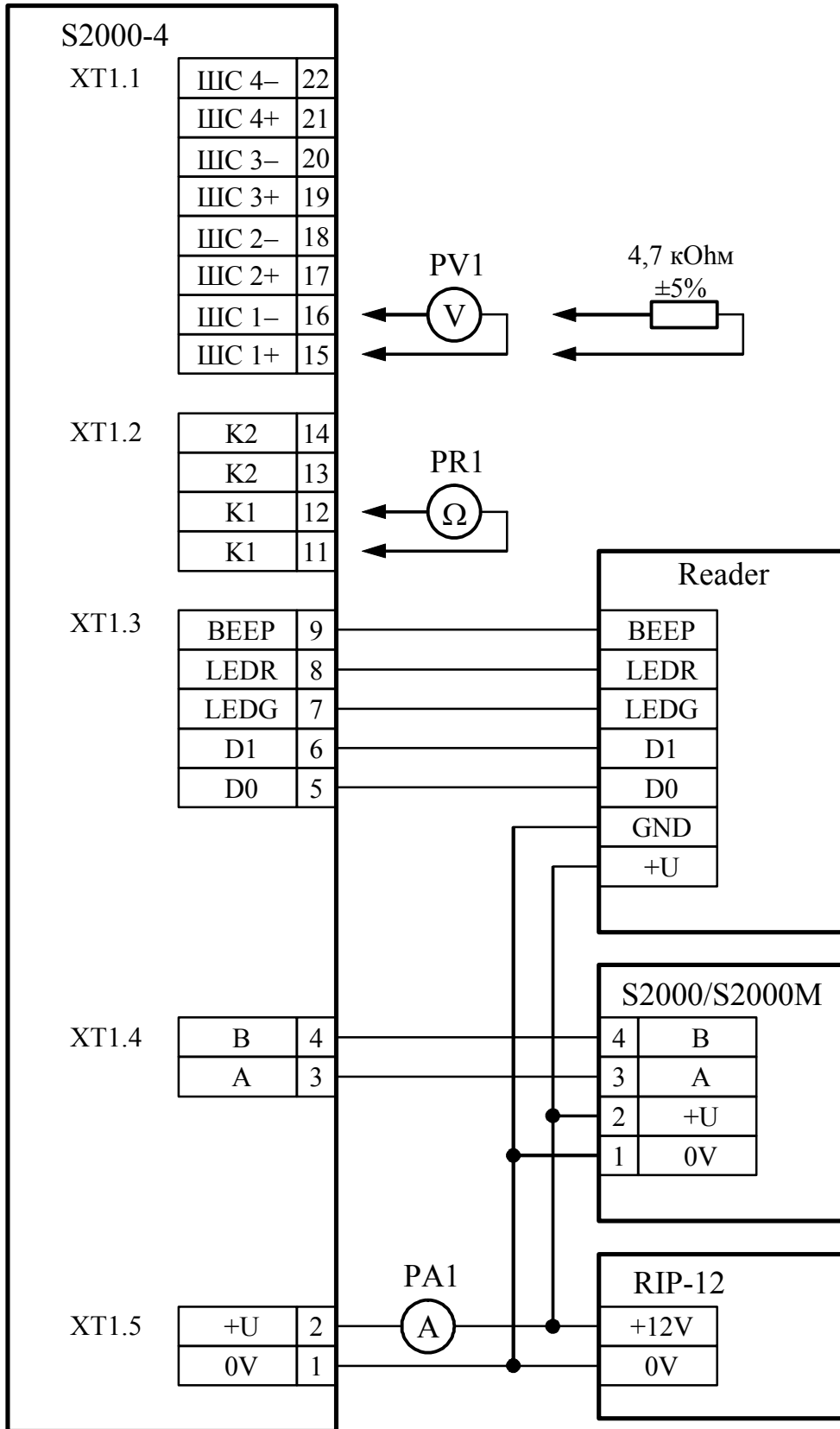
Connection of burglary detectors with tamper contacts into the type **5** (Burglary with tamper check) alarm loop
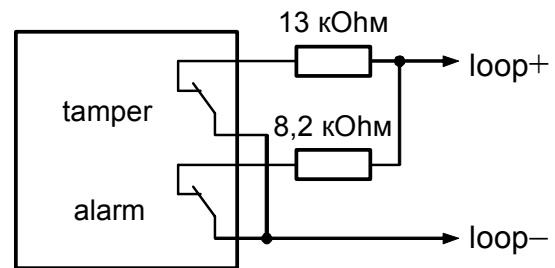
Connection of EXIT button and door opening detector into the type **4** (burglary) or type **7** (entering) alarm loop in case of access controlling
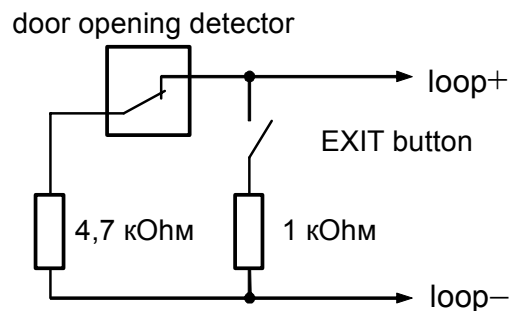
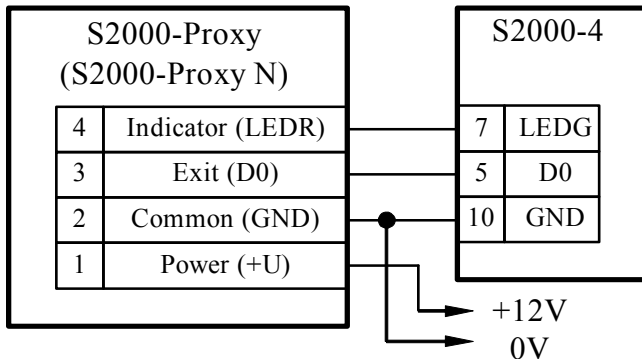# Appendix D. "S2000-4" testing connection diagram

PV1, **PR1** and **PA1** are correspondently voltage, resistance and current measurement modes of combined tester

Appendix E. Reader connection diagrams
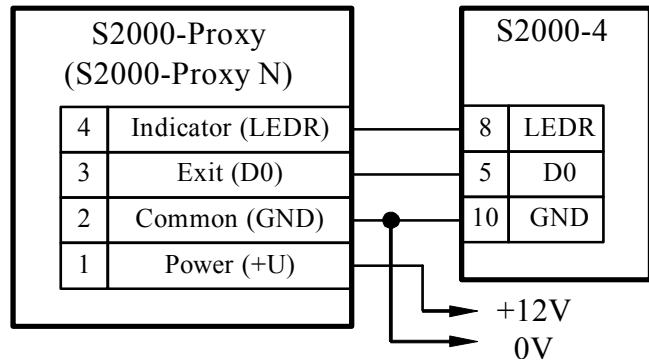
E1. S2000-Proxy and S2000-Proxy N reader connection

S2000-Proxy and **S2000-Proxy N**
connection diagram
(reader is used for access controlling)

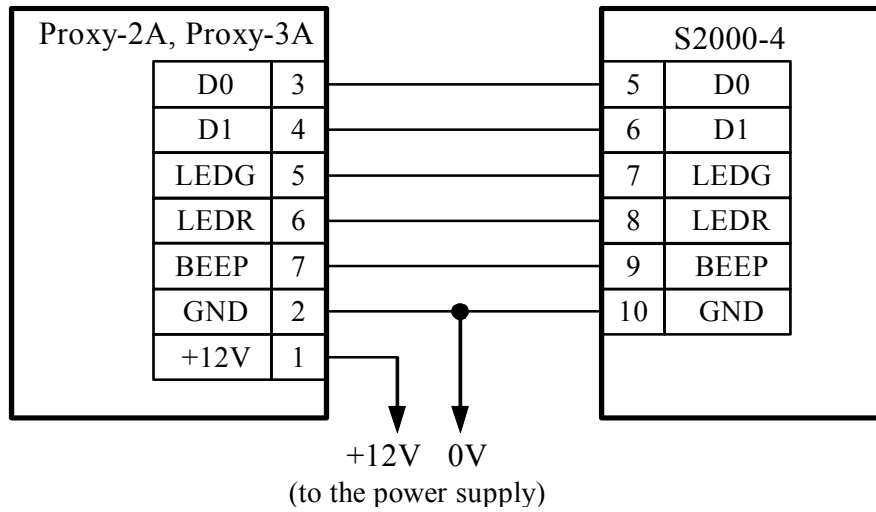|	S2000-Proxy (S2000-Proxy N)		S2000-4	
4	Indicator (LEDR)	7	LEDG	
3	Exit (D0)	5	D0	
2	Common (GND)	10	GND	
1	Power (+U)			

+12V
0V

S2000-Proxy and **S2000-Proxy N**
connection diagram
(reader is used for arming/disarming)

	S2000-Proxy (S2000-Proxy N)		S2000-4	
4	Indicator (LEDR)	8	LEDR	
3	Exit (D0)	5	D0	
2	Common (GND)	10	GND	
1	Power (+U)			

+12V
0V

"S2000-4" configuration parameters:

Reader interface type	**1 - Touch Memory**
LED control polarity	**direct (active "1")**

E2. Proxy-2A and Proxy-3A reader connection

Proxy-2A, Proxy-3A				S2000-4
D0	3	5	D0	
D1	4	6	D1	
LEDG	5	7	LEDG	
LEDR	6	8	LEDR	
BEEP	7	9	BEEP	
GND	2	10	GND	
+12V	1			

+12V   0V

(to the power supply)

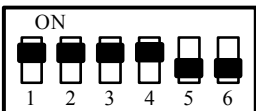**Variant 1 –Touch Memory** interface   **Variant 2 –Wiegand** interface

Reader DIP-switch settings

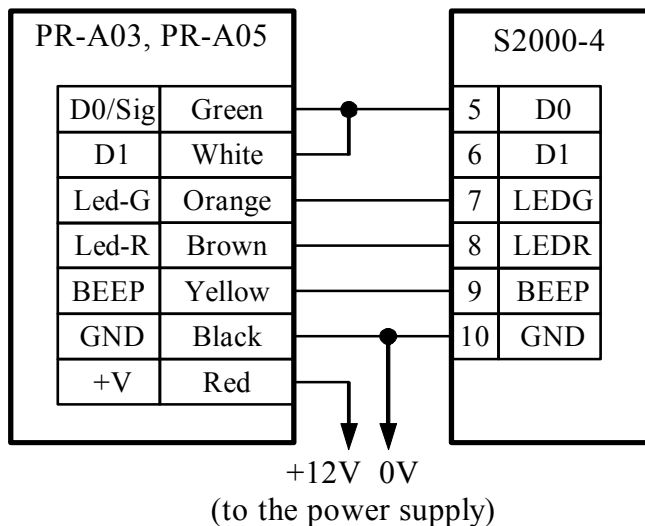Proxy-2A: Proxy-3A: Proxy-2A: Proxy-3A:
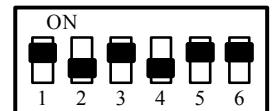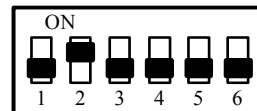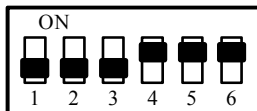
"S2000-4" configuration parameters:

Reader interface type	**1** **Touch Memory**
LED control polarity	**direct** **(active "1")**
Sounder control polarity	**direct** **(active "1")**

Reader interface type	**2** **Wiegand**
LED control polarity	**reverse** **(active "0")**
Sounder control polarity	**reverse** **(active "0")**

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E3. PR-A03, PR-A05 or PR-P09 reader connection

Variant 1 – Touch Memory interface

PR-A03, PR-A05			S2000-4	
D0/Sig	Green		5	D0
D1	White		6	D1
Led-G	Orange		7	LEDG
Led-R	Brown		8	LEDR
BEEP	Yellow		9	BEEP
GND	Black		10	GND
+V	Red			

+12V 0V
(to the power supply)

Variant 2 –Wiegand interface

PR-A03, PR-A05, PR-P09			S2000-4	
D0/Sig	Green		5	D0
D1	White		6	D1
Led-G	Orange		7	LEDG
Led-R	Brown		8	LEDR
BEEP	Yellow		9	BEEP
GND	Black		10	GND
+V	Red			

+12V 0V
(to the power supply)

"S2000-4" configuration parameters:

Reader interface type	**1-Touch Memory**
LED control polarity	**direct (active "1")**
Sounder control polarity	**direct (active "1")**

Reader interface type	**2-Wiegand**
LED control polarity	**reverse (active "0")**
Sounder control polarity	**reverse (active "0")**

E4. PR-H03, PR-H05 or PR-M09 reader connection

PR-H03, PR-H05, PR-M03			S2000-4	
D0/Sig	Green		5	D0
D1	White		6	D1
Led-G	Orange		7	LEDG
Led-R	Brown		8	LEDR
BEEP	Yellow		9	BEEP
GND	Black		10	GND
+V	Red			

+12V   0V
(to the power supply)
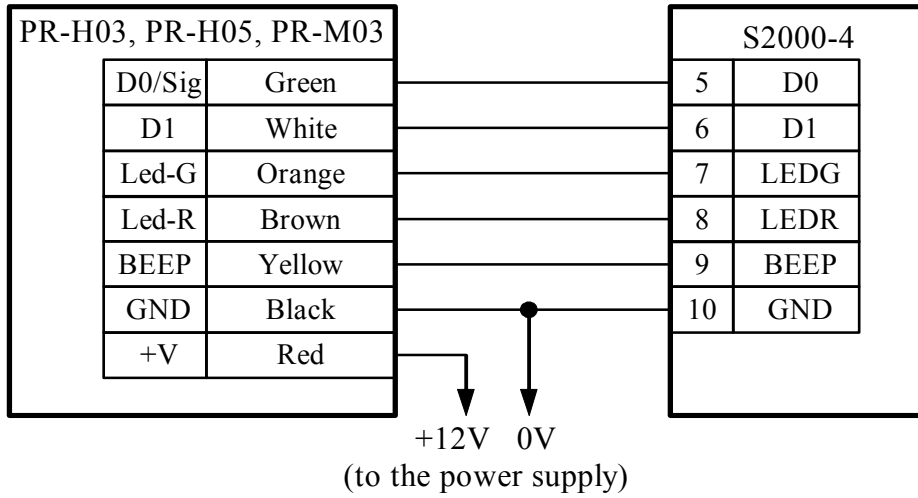
"S2000-4" configuration parameters:

Variant 1 –Touch Memory interface

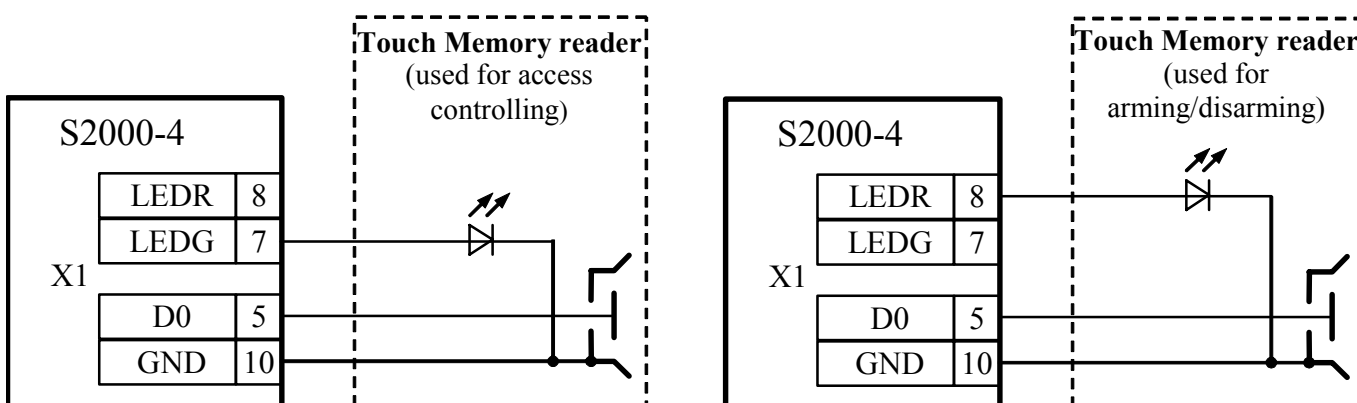| "S2000-4" configuration parameters		Reader jumpers	
Reader interface type	**1 - Touch Memory**	red	**delete**
		yellow	**delete**
LED control polarity	**direct (active "1")**	orange	**delete**
Sounder control polarity	**direct (active "1")**	green	**delete**

Variant 2 –Wiegand interface

"S2000-4" configuration parameters		Reader jumpers	
Reader interface type	**2 - Wiegand**	red	**set**
		yellow	**delete**
LED control polarity	**reverse (active "0")**	orange	**set**
Sounder control polarity	**reverse (active "0")**	green	**set**

E5. Touch Memory reader connection

Touch Memory reader connection in case of having two LED.
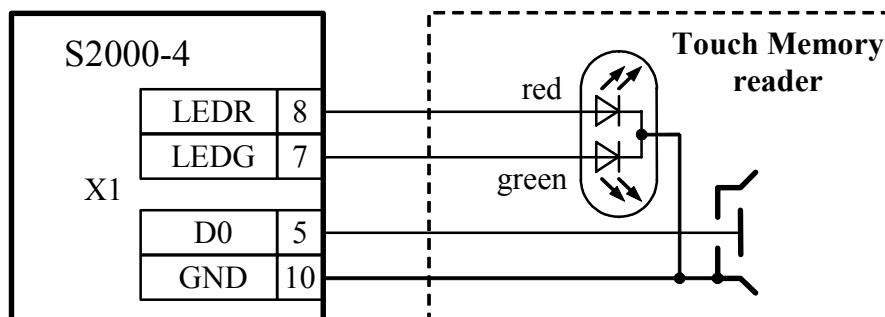
Touch Memory reader connection in case of having one unicolored LED.

"S2000-4" configuration parameters:

Reader interface type	**1 - Touch Memory**
LED control polarity	**direct (active "1")**

Warranty

Manufacturer warrants it 'S2000-4' product to be in conformance with specification under normal transportation, storage, mounting and maintenance.

Manufacturer warrants 'S2000-4' product to be free from defects in materials and workmanship for 18 months since putting in to operation, but no more then 24 months since production under normal use and service.

S2000-4 Panel

_____

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 _____ _____

Name   Date