SECURITY CODE

Sobol
Version 4

Setup and Management

Administrator Guide

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List of abbreviations

BIOS	Basic Input/Output System
IC	Integrity Check
M.2	PCI Express M.2 (Type 2230-D4-A-E)
Mini PCIe	Mini PCI Express
Mini PCIe Half	Mini PCI Express Half
NVRAM	Nonvolatile Random Access Memory
PCIe	PCI Express
RNG	Random Number Generator
SMBIOS	System Management BIOS
UEFI	Unified Extensible Firmware Interface

Introduction

This manual is designed for administrators of Hardware Trusted Boot Module Sobol. Version 4 (hereinafter Sobol , the product). It contains information that administrators need in order to install, configure and operate the product.

For information on how to configure the Sobol software, see document [**2**].

For information on how to work with Sobol, see document [**3**].

Document structure

Chapter 1 contains general information about Sobol protection mechanisms.

Chapter 2 describes how to install and remove the product.

Chapter 3 describes how to configure and work with the product.

Chapter 4 contains information about built-in IC template management.

Appendix contains Sobol messages, events and other information about Sobol operation.

Additional information

Web- site. Information about Security Code products can be found on https://www.securitycode.ru.

Technical support. You can contact technical support by phone: +7-800-505-30-20 or by email: support@securitycode.ru. Technical support web-page: https://www.securitycode.ru/.

Training. You can learn more about hardware and software products of Security Code in authorized education centers. List of the centers and information about learning environment can be found on https://www.securitycode.ru/. You can contact company representative for more information about organization of teaching process by email: education@securitycode.ru.

Chapter 1
General information

Purpose

Sobol is designed to prevent unauthorized access to resources of a protected computer.

The core functions of Sobol are:

- user identification and authentication while logging on to the system using security tokens (see Tab. 1 on p. **8**);
- protection from unauthorized boot using removable drives (floppy disks, ZIP, USB drivers, etc.);
- software and hardware integrity check before OS startup for the following objects:
  - files;
  - hard drive sectors;
  - system registry keys;
  - transaction log;
  - PCI devices;
  - SMBIOS data;
- watchdog timer — blocks a computer if UEFI/BIOS is not controlled by Sobol after startup;
- control of the main Sobol components (RNG operation, nonvolatile card memory and personal security tokens);
- registration of events related to information system security;
- interoperation with Secret Net Studio, Secret Net LSP.

Note. Sobol interoperates with other information security products in joint mode. For detailed information about Sobol joint mode, see p. **97**.

Sobol can protect computers and servers of a local network and standalone computers.

Operation principles

Sobol checks user credentials for logon. A user can log on to the system only if he or she presents a personal security token and types a password; otherwise logon is forbidden.

Note. To access a computer, user must be registered in a Sobol user list. Sobol administrator registers a user by assigning a name, a personal security token and a password for him/her. A Sobol administrator account is created during Sobol initialization.

The core protection mechanisms of Sobol are:

- user identification and authentication (see p. **8**);
- protection from unauthorized boot from removable drives (see p. **9**);
- software and hardware integrity check before OS startup (see p. **9**);
- watchdog timer (see p. **11**);
- registration of events related to information system security (see p. **12**);
- control of the main Sobol components (see p. **12**).

Note. Sobol operates with IC and watchdog timer mechanisms or without them.

To prepare Sobol for operation, you need to initialize it — to configure system, general, password, log and IC settings, create an administrator account and calculate checksums.

Sobol supports hardware defined and program defined initialization.

Hardware defined initialization is performed before starting to use the product, including the first installation of a Sobol card. Also it may be used for reset. To perform hardware defined initialization, switch the card to the initialization mode.

Program defined initialization is performed when Sobol is in operation. It may be used to change the parameters that were configured when the card was installed. To perform program defined initialization, select the respective command in the Sobol menu. You do not need to switch the card to the initialization mode.

When Sobol is in operation, an administrator can configure settings, perform card diagnostics and service operations, manage users, work with the Sobol log.

Identification and authentication

The identification and authentication mechanism of Sobol ensures verification of user credentials for access to a protected computer every time a user attempts to log on.

Sobol identifies a user by a security token unique identifier. To authenticate, Sobol verifies a user password using a user Secure ID.

Note. A Secure ID is a data structure stored in a user security token.

Tab. 1 Security tokens used in Sobol

iButton keys	USB keys	Smart cards
DS1992	Rutoken	Rutoken Lite
DS1993	Rutoken Lite	
DS1994	Rutoken RF	
DS1995		
DS1996		

USB keys, USB smart card readers, USB iButton readers are plugged into computer USB ports. iButton keys are connected to an external, internal or USB iButton reader.

Sobol supports two-factor authentication (for iButton keys) and enhanced two-factor authentication (for USB keys and smart cards).

Two-factor authentication requires a personal security token and a password.

Enhanced two-factor authentication requires a personal security token, a security token PIN and a password.

For identifiers supporting enhanced two-factor authentication, manufacturer sets a default PIN (see **Recommendations** on p. **51**). We recommend changing a default PIN for more effective protection from unauthorized access.

Attention!

- You can change a PIN using tools of a security token manufacturer.
- If an administrator set a PIN for a user security token, he or she should provide the PIN to a user.
- **12345678** is a default PIN for Rutoken, Rutoken RF and Rutoken Lite.
  If the default PIN is invalid, contact the security token vendor.

If a not registered security token is presented, logon to the system is forbidden and an unauthorized attempt is registered in the Sobol log.

If a password does not correspond to the presented security token:

- logon to the system is forbidden;
- the number of failed logon attempts is increased by one;

Note.
- If the number of failed logon attempts reaches the maximum permitted value, which is set by an administrator, logon to the system is forbidden.
- If the number of failed logon attempts less then the maximum permitted value, the counter of failed logon attempts resets after the first successful logon.

- unauthorized attempt is registered in the Sobol log.

Service user data (user name, security token, etc.) is stored in the Sobol nonvolatile memory.

Administrator can set the maximum number of users (see Tab. 4 on p. **25**, parameter **The maximum number of users and log events**).

Administrator can perform the following additional procedures related to identification, authentication, changing user password and Secure ID:

- set a timeout for presenting a security token and typing a password when logging on to the system;
- generate a random password when registering an administrator or user and changing a password;
- configure password settings (maximum password age, minimum password length, check password complexity, the minimum number of new characters).

Attention! Passwords and Secure ID management in joint mode is performed using the tools of a product that operates in tandem with Sobol.

Protection from unauthorized boot from removable drives

Sobol denies access to removable drives (floppy disks, ZIP, USB drivers, etc.) until an OS is loaded. Access is granted after successful OS boot.

Boot using removable drives is denied for all users except the administrator.

Note.
The administrator can allow certain users to boot an OS using removable drives (see p. **54**).
The administrator can make a removable drive trusted for OS boot (see p. **23**). Thus, an OS is booted from the removable drive despite such boot type is forbidden for a user.

Integrity check

The integrity check mechanism ensures monitoring of changes in parameters of software and hardware computer resources before booting an OS.

Sobol supports integrity check of objects described in the table below (hereinafter — IC objects).

Furthermore, Sobol supports control of a NTFS, EXT3 and EXT4 transaction log. In this case, Sobol controls integrity of IC objects and templates if partially completed transactions are in the log. This procedure is performed before the main integrity check procedure.

Tab. 2 IC objects of Sobol

IC objects	Description
Files	Certain files and groups of files/directories/subdirectories on a computer hard disk
Hard drive sectors	Master Boot Records, NTFS Boot Sectors, GUID Partition Tables, etc.
System registry items	Windows registry keys and variables
PCI devices	PCI and PCIe devices with the respective drivers. Control modes: • Basic (control of presence /absence of a device); • Optimal (control of 256 bytes of a device's configuration space); • Advanced (control of 256 bytes of a device's configuration space and 4 KB of extended configuration space)

IC objects	Description
SMBIOS data	SMBIOS data about a motherboard (manufacturer, processor, system slots, memory, UEFI/BIOS, etc.)

The integrity check mechanism is based on calculating the checksums of IC objects and comparing the calculated values to the reference values which was calculated earlier.

The list of IC objects is contained in IC templates. You can manage the IC templates:

- in standalone mode — using the Sobol built-in tool (see p. **75**) or the Sobol software (see document [**2**]);
- in joint mode — using tools of a product that operates in tandem with Sobol.

Note.
- IC template is a service file which contains identification data and checksums of IC objects. IC templates are stored in a computer hard drive.
- Sobol built-in tool works with a single IC template in the .json format. The administrator creates this template manually and manages it in the Sobol interface.
- Sobol software works with multiple IC templates depending on IC object types:
  - files.nam, files.chk — IC templates for files;
  - sectors.nam, sectors.chk — IC templates for hard drive sectors;
  - registry.nam, registry.chk — IC templates for system registry items;
  - pci.nam, pci.chk — IC templates for PCI devices;
  - smbios.nam, smbios.chk — IC templates for SMBIOS data.

  IC templates are created during the Sobol software installation. An administrator manages them using the Sobol software in an OS.

If Sobol operates in standalone mode, a Sobol administrator calculates reference checksums. In joint mode, reference checksums are calculated by a Sobol administrator or an administrator of a product that operates in tandem with Sobol. Reference checksums are written to IC templates. Then IC template checksums are calculated and stored in the protected NVRAM.

Reference checksums are calculated using an IC key according to the following algorithms:

- GOST 28147–89 using MAC (Message Authentication Code) Generation Mode;

  Attention! Use this algorithm while working in joint mode and ensuring compatibility with older Sobol versions.

- Magma (GOST R 34.12-2015, GOST 34.12-2018) using MAC (Message Authentication Code) Generation Mode (GOST R 34.13-2015, GOST 34.13-2018).

Verification of the checksums is performed when administrator and users log on to the system. First, the checksums of IC templates are calculated and compared to the reference values. Then, checksums of IC objects are calculated and compared to the reference values. If an integrity violation is occurred, the respective event is written to the Sobol log.

Sobol supports periodic updating of an IC key. The following actions are performed in this case:

- the checksums of IC templates are verified when an administrator and users log on to the system;
- if the verification is completed with a success, an IC key is updated;
- then, the checksums of IC templates are recalculated.

If the verification is completed with errors, the IC key is not updated, the checksums are not recalculated and the respective event is written to the Sobol log.

Sobol supports the soft and hard IC modes. Administrator set the IC mode individually for each user.

If an integrity violation is occurred in **hard mode**, an IC key in not updated, user logon to the system is forbidden and a computer is locked.

If an integrity violation is occurred in **soft mode**, an IC key in not updated but user logon to the system is permitted.

Attention! When using the IC mechanism, note that:

- do not use OS boot managers that allow installing multiple OS on a computer;
- do not compress a folder with IC templates;
- NTFS Symbolic Link, NTFS Hardlink and Windows Junction Point are not supported in the IC templates;
- integrity check of files converted by other programs such as cryptographic software (BestCrypt, etc.) or disk compression tools (Driverspace, etc.) is not supported;
- integrity check of objects on volume sets and stripe sets (for example, LVM, StripeSet, Volume set, Software RAID) is not supported.

Watchdog timer

The watchdog mechanism blocks access to the computer if the UEFI/BIOS Option ROM is not provided with control after the computer is turned on and the specified time interval, called a watchdog timer timeout, expires.

Access to the computer can be blocked by:

- forced automatic restart of the computer with the Reset procedure. To block the computer, the RST watchdog cable is used (see. section A, Fig. 1 on p. **11**), which is included in the delivery;
- forced automatic shutdown of the computer. To block the computer, the following components can be used, delivered on request:
  - ATX cable watchdog relay (see B), Fig. 1 on p. **11**);

    Note. ATX cable watchdog relay is designed for use in ATX form factor computers.
  - PWR watchdog cable with two T-Tap connectors (see C), Fig. 1 on p. **11**), which used to connect the RST watchdog cable to the Power button cable in parallel;
  - connectors to connect the RST watchdog cable to the Power button cable in parallel (see D), Fig. 1 on p. **11**).

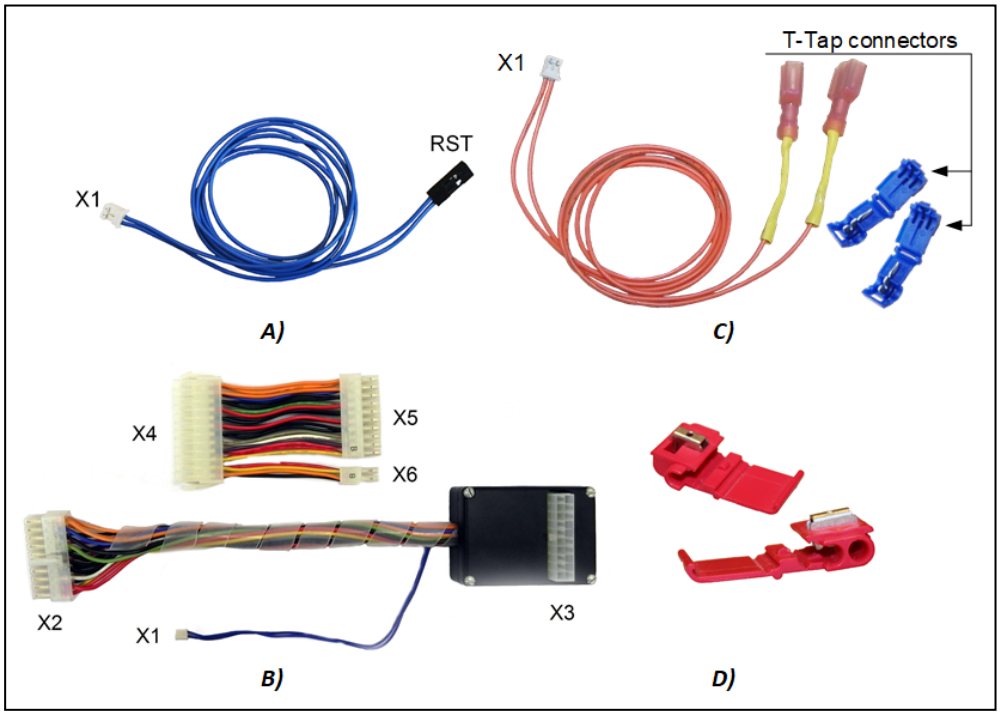


Fig. 1 Sobol components for watchdog timer

To use the watchdog timer, you need to connect the RST watchdog cable, PWR watchdog cable or ATX cable watchdog relay to the Sobol card. The watchdog timer does not function without cable or relay connection.

On a PCIe card of Sobol, a SATA power connector is installed to improve the watchdog timer efficiency. Connecting the SATA power cable to it allows you to maintain the watchdog timer functioning if the power at the PCIe slot on the computer motherboard is turned off (e.g. if the PCIe slot is blocked in UEFI/BIOS Setup).

The recommended watchdog timer timeout is determined automatically at the stage of the Sobol initialization. The administrator can modify the timeout value during Sobol initialization or operation. The maximum timeout value is 65534 seconds.

Attention! To prevent loss of applications caused by the watchdog timer when the computer switches from the standby mode, do not use the standby mode in the Windows OS if UEFI/BIOS parameters include the ACPI "S3" or "S4" (Suspend To RAM) power saving mode. In these cases, we recommended you to use the sleep mode instead of the standby mode or modify the UEFI/BIOS power saving mode.

Sobol log

Events logged by Sobol are stored in the log.

The log is stored in a special area of the Sobol nonvolatile memory. The memory size is limited.

Note. The maximum log size can be set to 1000, 2000 or 3000 events depending on the maximum number of Sobol users (see Tab. 4 on p. 25, **The maximum number of users and log events** parameter).

To work with the log, the following functions are available:

- saving (export) to a log file;
- searching for events in the log by their creating time and type;
- automatic events overwriting when the log is 100% full;
- setting the time period for the log audit.

Monitoring Sobol components performance

The Sobol monitoring mechanism is designed to check the operation of the following Sobol components:

- memory card;
- random number generator (RNG);
- security token.

The check is performed by testing the components. You can launch this procedure before the Sobol initialization during its operation.

Tip. We recommend you to test all components before the Sobol initialization.

Hardware and software requirements

Sobol can be installed on computers with 64-bit processors. To connect the Sobol card to the computer motherboard, there must be a free PCIe slot (version 1.0a and above), or Mini PCI Express slot (hereinafter - Mini PCIe slot), or M.2 slot.

Sobol operates with NTFS, FAT16, FAT32, EXT2, EXT3, EXT4 file systems.

The Sobol performance does not depend on the type of OS.

Note. To manage integrity check templates, you can use auxiliary software, which successful operation depends on the computer OS. Requirements for Sobol auxiliary software installation are specified in document [**2**].

In order for the watchdog timer to function, the computer motherboard must meet at least one of the following requirements:

- Reset socket is available;
- ATX cable watchdog relay connector is available;

- RST watchdog cable can be connected to the Power button cable in parallel.

When the Reset signal is sent to the computer motherboard slot to which the RST watchdog cable is connected, the computer must be rebooted. When a signal is sent to the power connector on computer motherboard to which the ATX cable watchdog relay is connected, or to the Power button cable to which the RST or PWR watchdog cable is connected, the computer must be turned off. The computer's software and hardware must be unable to interrupt this mechanism (for example, by disabling it in UEFI/BIOS Setup).

The power connector on the computer motherboard must comply with the ATX specification and have 20 or 24 pins. The power supply unit must meet the requirements of the ATX specification.

Attention! On some models of computer motherboards, Sobol does not function in Legacy mode. For more information, please contact the Security Code LLC service department (https://www.securitycode.ru/services/).

Chapter 2
Installing and removing Sobol

Installation procedure

Sobol is installed in the following order:

- install Sobol software (if necessary);

> **Note.**
> - In standalone mode, Sobol can be used both with Sobol software and without it.
> - In joint mode, Sobol operates correctly when the Sobol software is installed.
> - For detailed information on how to install and work with the Sobol software, see [2].

- install the Sobol card (see p. **14** for a PCIe card, p. **17** for a Mini PCIe Half card, p. **21** for a M.2 card);
- initialize Sobol (see p. **21**);
- put Sobol into operation (see p. **37**).

Install PCIe card

To install a PCIe card:

1. Shut down your computer. Remove the side panel.
2. Switch SW1-1 to the OFF position (see the figure below).

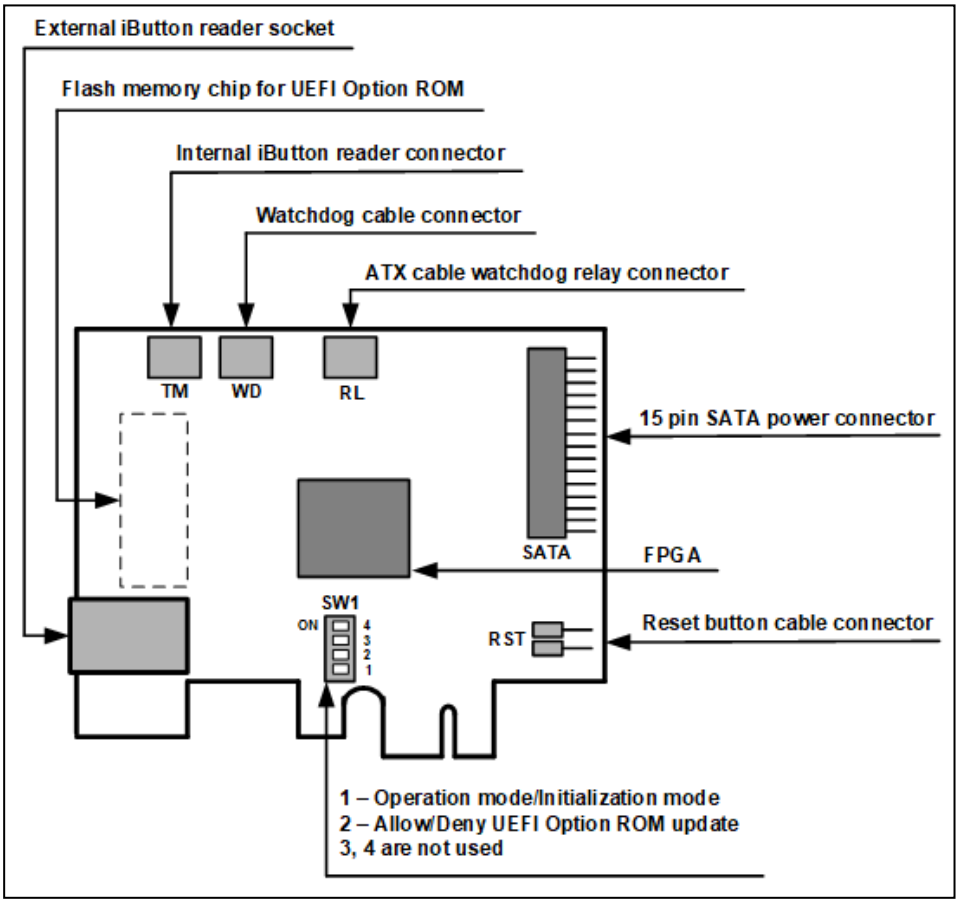


Fig. 2 PCIe card

3. **To use the Sobol watchdog timer:**

RST watchdog cable

- To enable forced automatic restart:
  - disconnect the Reset button cable from the motherboard;
  - connect the Reset button cable to the RST connector on the Sobol card (see the figure above);
  - connect the RST watchdog cable to the WD connector on the Sobol card and to the Reset connector on the motherboard;
  - connect the power cable to the SATA connector on the Sobol card (see the figure above).

24-ATX cable watchdog relay

- To enable forced automatic shutdown:
  - disconnect the power cable from the motherboard;
  - connect the power cable to the X4 connector of the ATX cable watchdog relay (see Fig. 1 on p. **11**);
  - connect the X5 connector to the X3 connector;
  - connect the X2 and X6 connectors to the ATX connector on the motherboard;
  - connect the X1 connector to the RL connector on the Sobol card (see the figure above);
  - connect the power cable to the SATA connector on the Sobol card (see the figure above).

20-ATX cable watchdog relay

- To enable forced automatic shutdown:
  - disconnect the power cable from the ATX connector on the motherboard;
  - connect the power cable to the X3 connector of the ATX cable watchdog relay (see Fig. 1 on p. **11**);
  - connect the X2 connector to the ATX connector on the motherboard;
  - connect the X1 connector to the RL connector on the Sobol card (see the figure above);
  - connect the power cable to the SATA connector on the Sobol card (see the figure above).

PWR watchdog cable with T-Tap connectors

- To enable automatic shutdown:
  - fold T-Tap connectors (see C), Fig. 1 on p. **11**) over the wires of the power cable using pliers (see Step 1, Fig. 3 on p. **16**);
  - connect the X1 connector of the PWR watchdog cable (see C), Fig. 1 on p. **11**) to the WD connector on the Sobol card. Then, plug the spades of the PWR watchdog cable into the T-Tap connectors (see Step 2, Fig. 3 on p. **16**);
  - connect the power cable to the SATA connector on the Sobol card (see the figure above).

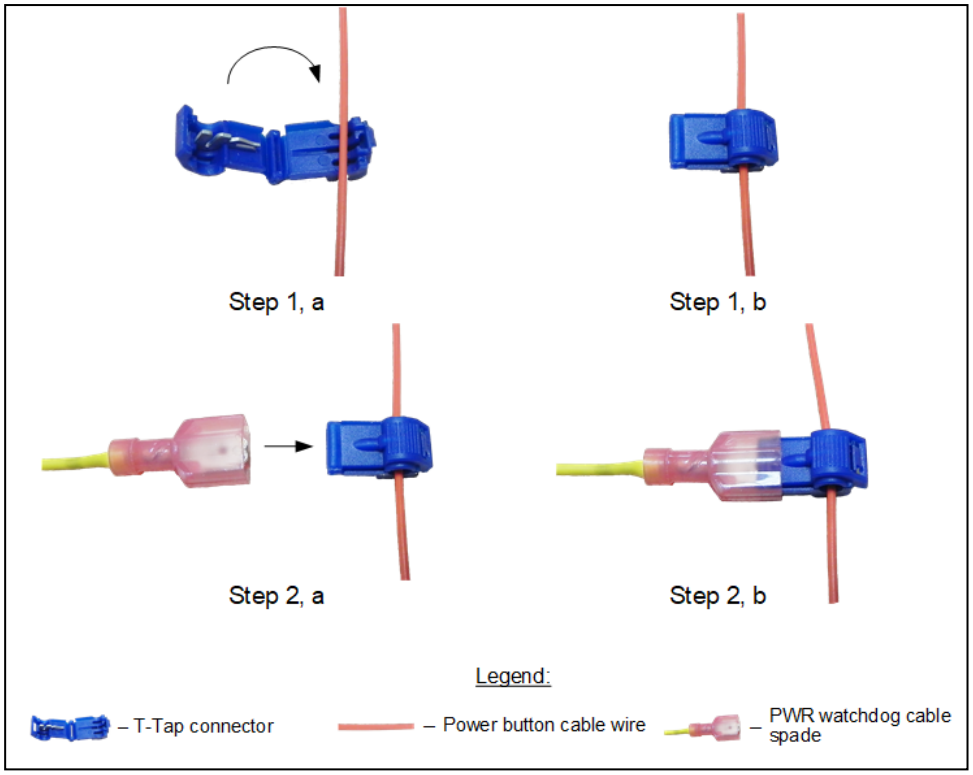


Fig. 3 The PWR watchdog cable with T-Tap connectors

RST watchdog cable with connectors

- To enable forced automatic shutdown:
  - cut off the RST connector from the RST watchdog cable (see Step 1, Fig. 4 on p. **17**);
  - insert one wire of the RST watchdog cable to the connector (see Step 2, Fig. 4 on p. **17**);
  - insert one wire of the Power button cable to the connector (see Step 3, Fig. 4 on p. **17**);
  - press the copper piece using pliers (see Step 4, Fig. 4 on p. **17**);
  - close the cover of the connector (see Step 5, Fig. 4 on p. **17**);
  - repeat Steps 2-5 (see Fig. 4 on p. **17**) with another wires of the cables;
  - connect the X1 connector of the RST watchdog cable to the WD connector on the Sobol card.

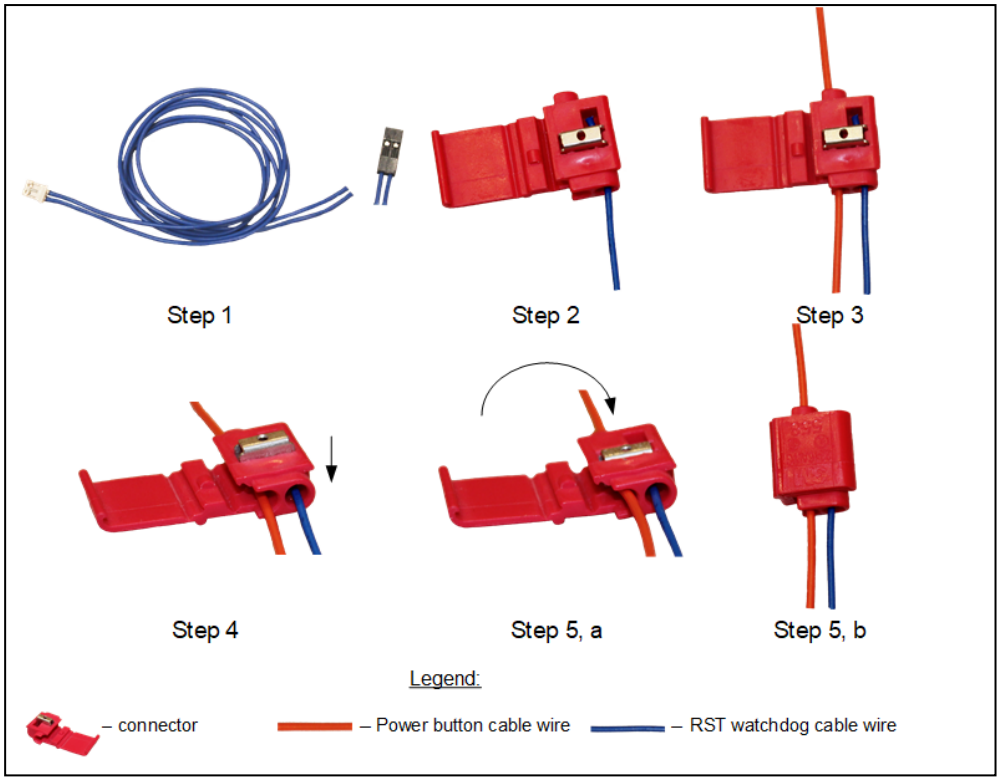


Fig. 4 Connecting the RST watchdog cable to the Power button cable in parallel

4. Insert the PCIe card into a free PCIe slot.
5. If necessary, attach an iButton reader to the PCIe card:
   - for the external iButton reader, attach it to the respective socket;
   - for the internal iButton reader, attach it to the TM connector.
6. Put the side panel back.
7. If necessary, attach a USB reader.

Install Mini PCIe Half card

A Mini PCIe Half card (see the figure below) can be installed autonomously or using an adapter depending on a protected computer form factor. You can use four adapter types which differ in terms of size and ability to attach either the external or the internal iButton reader:

- type 1 (see Fig. 6 on p. **18**) for the external and the internal iButton readers;
- type 2 (see Fig. 7 on p. **18**) and type 3 (see Fig. 8 on p. **19**) for the internal iButton reader;
- type 4 (see Fig. 9 on p. **19**) for the external iButton reader.

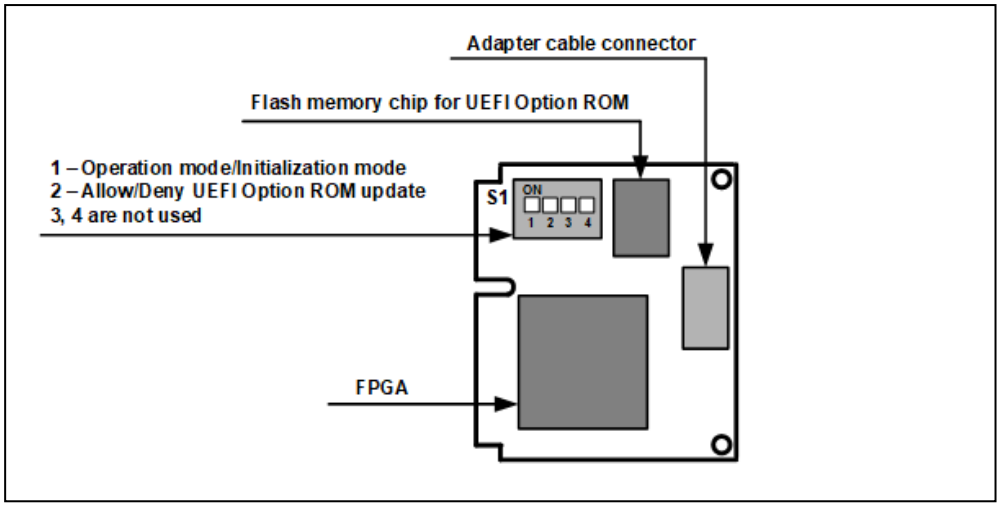


Fig. 5 Mini PCIe Half card

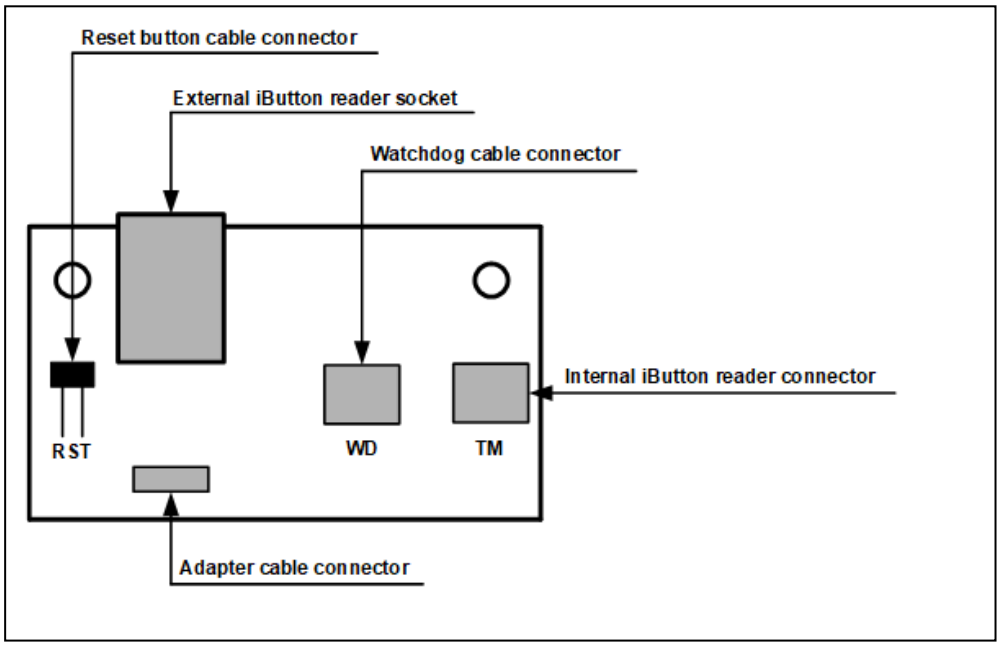


Fig. 6 Adapter for Mini PCIe Half and M.2 cards (type 1)

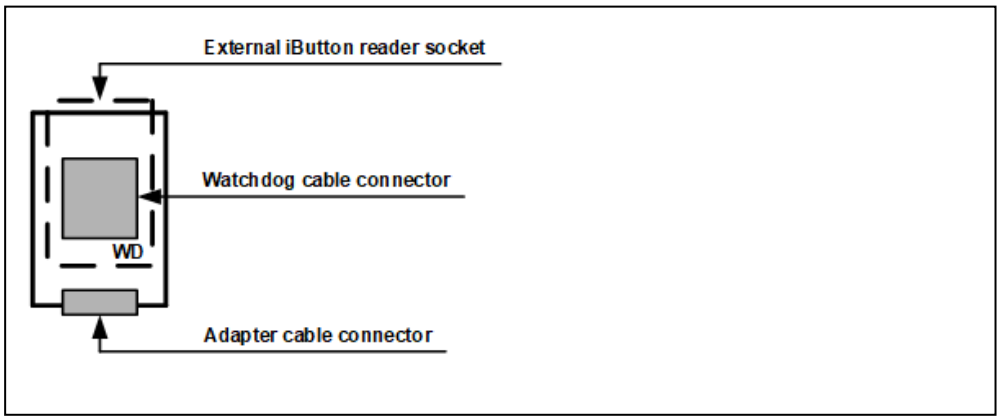


Fig. 7 Adapter for Mini PCIe Half and M.2 cards (type 2)

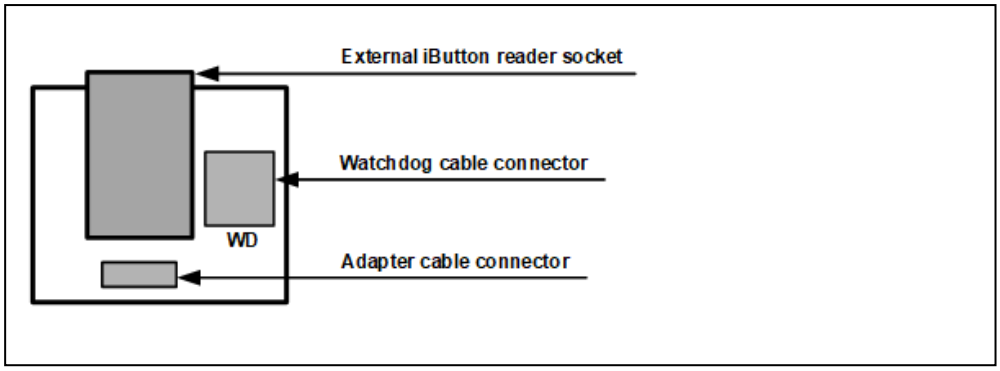


Fig. 8 Adapter for Mini PCIe Half and M.2 cards (type 3)

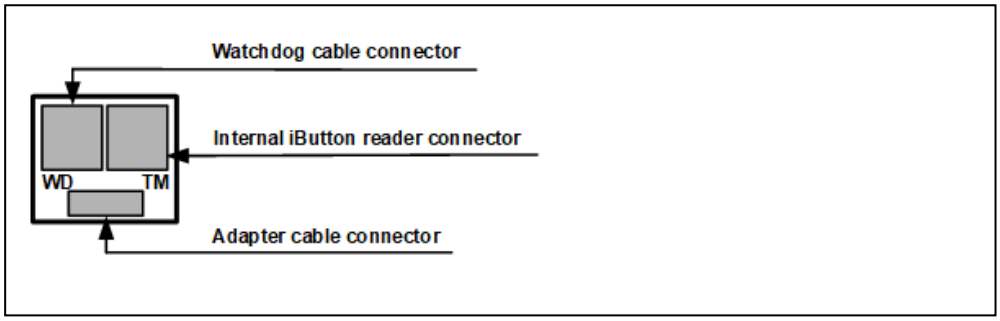


Fig. 9 Adapter for Mini PCIe Half and M.2 cards (type 4)

To install a Mini PCIe Half card using an adapter:

1. Shut down your computer. Remove the side panel.
2. Switch S1-1 to the OFF position (see Fig. 5 on p. **18**).
3. Connect the adapter cable to the respective card and adapter connectors.
4. **To use the Sobol watchdog timer:**

RST watchdog cable

- To enable forced automatic restart:
  - disconnect the Reset button cable from the motherboard;
  - for an adapter of type 1, connect the Reset button cable to the RST connector on the adapter;
  - for an adapter of types 2, 3 and 4, do not connect the Reset button cable anywhere;
  - connect the X1 connector of the RST watchdog cable (see A), Fig. 1 on p. **11**) to the WD connector on the adapter and to the Reset connector on the motherboard.

PWR watchdog cable with T-Tap connectors

- For blocking a computer by forced automatic shutdown:
  - fold T-Tap connectors (see C), Fig. 1 on p. **11**) over the wires of the power cable using pliers (see Step 1, Fig. 3 on p. **16**);
  - connect the X1 connector of the PWR watchdog cable (see C), Fig. 1 on p. **11**) to the WD connector on the adapter. Then, plug the spades of the PWR watchdog cable into the T-Tap connectors (see Step 2, Fig. 3 on p. **16**).

RST watchdog cable with connectors

- To enable forced automatic shutdown:
  - cut off the RST connector from the RST watchdog cable (see Step 1, Fig. 4 on p. **17**);
  - insert one wire of the RST watchdog cable to the connector (see Step 2, Fig. 4 on p. **17**);
  - insert one wire of the Power button cable to the connector (see Step 3, Fig. 4 on p. **17**);
  - press the copper piece using pliers (see Step 4, Fig. 4 on p. **17**);

- close the connector cover (see Step 5, Fig. 4 on p. **17**);
- repeat Steps 2-5 (see Fig. 4 on p. **17**) with another wires of the cables;
- connect the X1 connector of the RST watchdog cable to the WD connector on the adapter.

5. Insert the Mini PCIe Half card into a free Mini PCIe slot.
6. Insert the adapter into a free slot.

Note. You can also attach the adapter to a Standard/Low Profile bracket or in any other way.

7. If necessary, attach the iButton reader to the adapter:
   - for the external iButton reader, attach it to the respective socket on the adapter of types 1, 2 or 3;
   - for the internal iButton reader, attach it to the TM connector on the adapter of types 1 or 4.
8. Put the side panel back.
9. If necessary, attach a USB reader.

To install a Mini PCIe Half card autonomously:

1. Shut down your computer. Remove the side panel.
2. Switch S1-1 to the OFF position (see Fig. 5 on p. **18**).
3. Insert the Mini PCIe Half card into a free Mini PCIe slot.
4. Put the side panel back.
5. If necessary, attach a USB reader.

Install M.2 card

A M.2 card (see the figure below) can be installed autonomously or using an adapter depending on a protected computer form factor. You can use four adapter types which differ in terms of size and ability to attach either the external or the internal iButton reader (see the description on p. **17**).

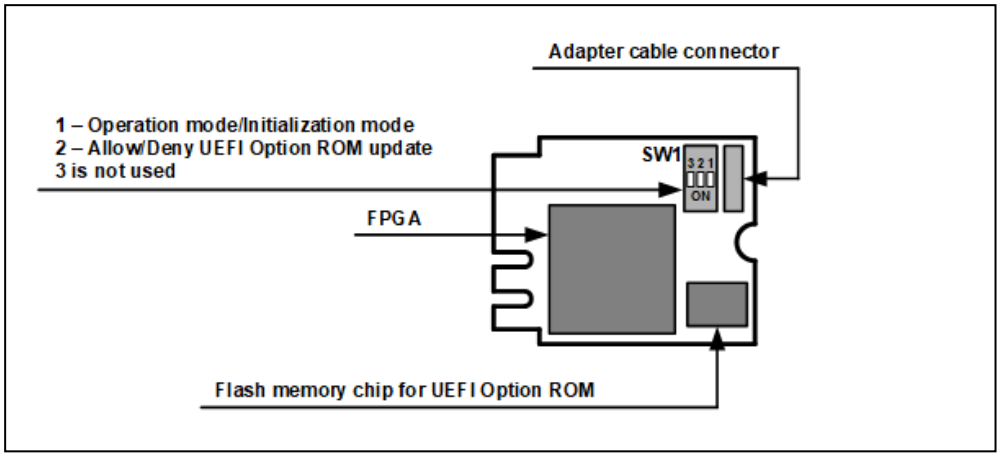


Fig. 10 M.2 card

To install a M.2 card using an adapter:

1. Shut down your computer. Remove the side panel.
2. Switch SW1-1 to the OFF position.
3. Connect the adapter cable to the respective card and adapter slots (see Fig. 6 on p. **18**, Fig. 7 on p. **18**, Fig. 8 on p. **19**, Fig. 9 on p. **19**).
4. **To use the Sobol watchdog timer**, connect the RST watchdog cable or the PWR watchdog cable (see Step 4, p. **19**).
5. Insert the M.2 card into a free M.2 slot.
6. Insert the adapter into a free slot.

   Note. You can also attach the adapter to a Standard/Low Profile bracket or in any other way.
7. If necessary, attach the iButton reader to the adapter:
   - for the external iButton reader, attach it to the respective socket on the adapter of types 1, 2 or 3;
   - for the internal iButton reader, attach it to the TM connector on the adapter of types 1 or 4.
8. Put the side panel back.
9. If necessary, attach a USB reader.

To install a M.2 card autonomously:

1. Shut down your computer. Remove the side panel.
2. Switch SW1-1 to the OFF position (see the figure above).
3. Insert the M.2 card into a free M.2 slot.
4. Put the side panel back.
5. If necessary, attach a USB reader.

Initialize Sobol

To initialize Sobol, take the following steps:

1. Configure system settings (see p. **23**).
2. Configure general settings (see p. **24**).
3. Configure password settings (see p. **27**).

4. Configure log settings (see p. 26).
5. Create and configure an administrator account (see p. 29).
6. Configure integrity check settings and calculate checksums (see p. 33).

Attention! Before starting the initialization, disconnect all USB Mass Storage devices from your computer (USB, CD and DVD drives, etc).

Start initialization

To start the initialization:

1. Power on your computer.

   The computer is controlled by Sobol. The card memory and RNG tests begin.

   RNG test starts.

Attention! If a computer is not controlled by Sobol after power-on, take the following actions:
- in UEFI/BIOS Setup, allow booting from a network adapter option ROM;
- use the Sobol watchdog timer (see p. 14 for a PCIe card, p. 19 for a Mini PCIe card and a M.2 card);
- in UEFI/BIOS Setup, set the Sobol card as the first boot device.

In this case, OS boot is performed only from a hard drive (if the hard drive exists in the UEFI/BIOS Setup boot menu).

After the successful tests, a window appears as in the figure below.

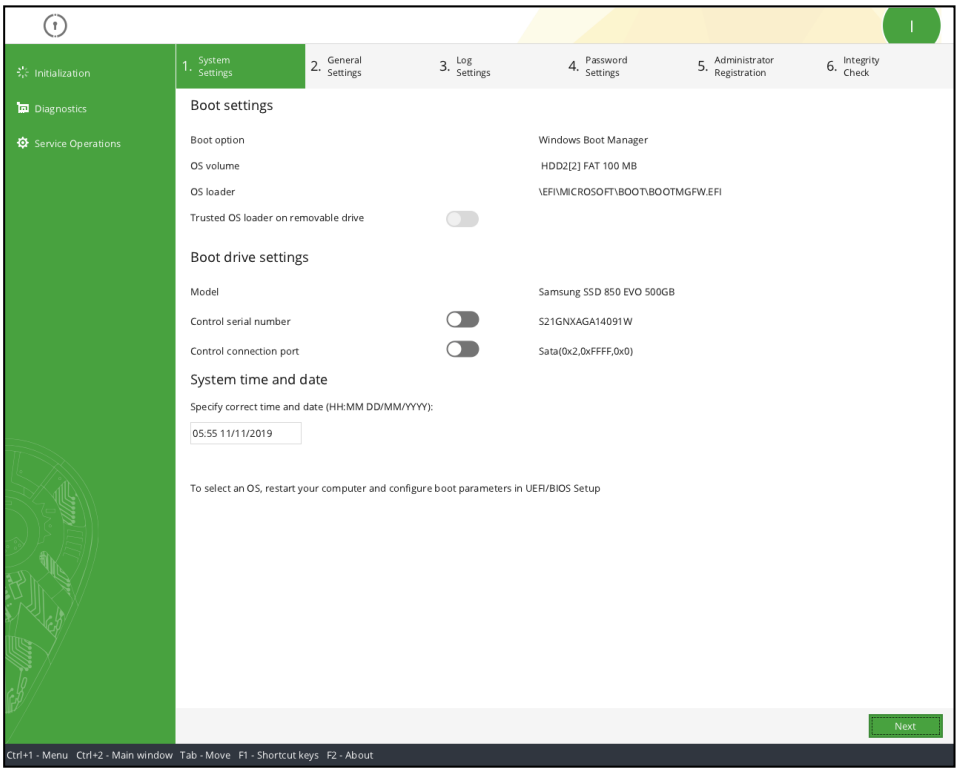


Fig. 11 Sobol initialization section

Note. If the tests finished with errors, a computer is blocked for all users including the administrator. For detailed information about the error, see p. 90.

The **I** indicator in the top right corner displays that Sobol is being initialized.

The navigation panel contains procedures available during the initialization:

- **Initialization** — start the initialization;
- **Diagnostics** — check Sobol components performance;

  Tip. We recommend checking performance of all the components before starting the initialization. In **Diagnostics**, select the **Run All Tests** command. For detailed information, see p. 67.

- **Service operations** — set the system time and date, perform operations with security tokens and UEFI Option ROM. For detailed information, see p. **68**.

Note. **Diagnostics** and **Service operations** become unavailable after you configure system settings during the initialization (see p. **22**).

The display area of the main window contains information about the procedure (its progress, parameters, messages, etc.) and the respective buttons.

The ribbon at the bottom contains a description for shortcut key actions.

To work in the interface, use the mouse or the following keys on the keyboard:

- **<Ctrl>** + **<1>** / **<Ctrl>** + **<2>** — to move a pointer to the navigation panel/display area;
- **<Tab>** — to navigate through menus/parameters;
- **<Enter>** — to select a menu/parameter;
- **<Space>** — to change a parameter value (if necessary enter a new value using the keyboard);
- **<F1>** — shortcut key list;
- **<F2>** — product information.

2. On the navigation panel, select **Initialization**.

   The initialization starts. The initialization steps are displayed at the top of the main window.

Note. During the initialization, you can return to the previous steps before administrator registration (see p. **29**).

Configure system settings

Attention! After you configure the system settings and go to the next step, **Diagnostics** and **Service operations** become unavailable.

The **System Settings** window (see Fig. 11 on p. **22**) contains parameters described in the figure below.

Note. If you boot from network cards, the system settings are different from ones shown in Fig. 11 on p. **22**.

1. Configure Sobol system settings using the table below.
2. Select **Next**.

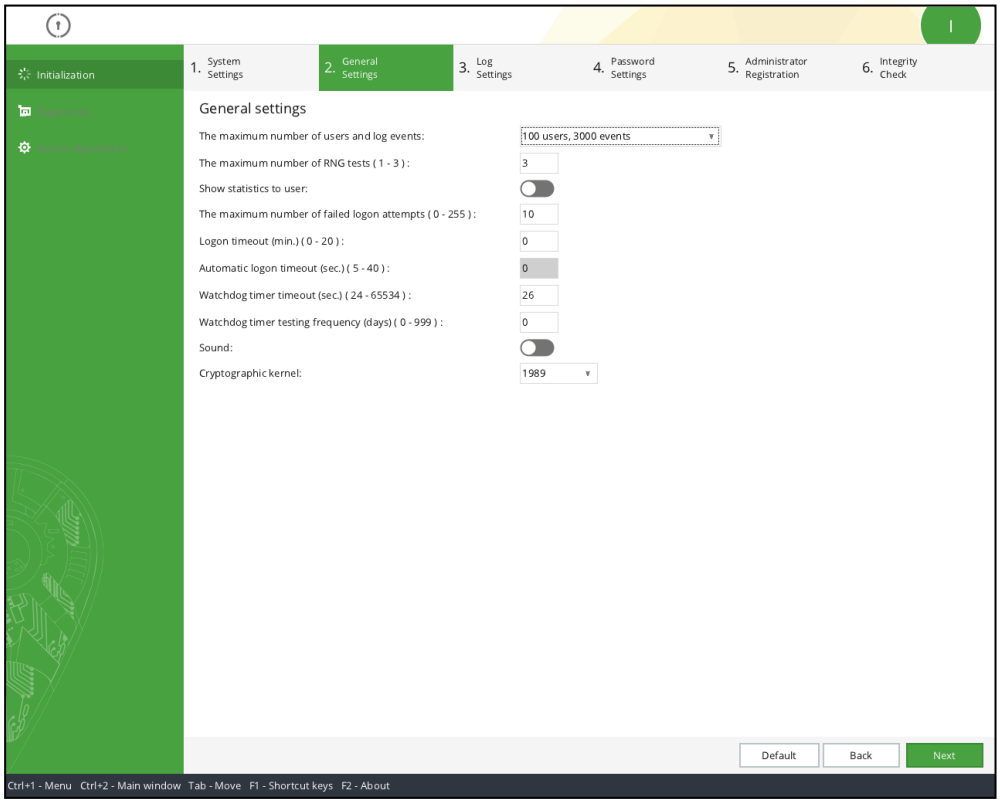
Tab. 3 The Sobol system settings

Boot option
Displays the selected boot option. To configure the parameter, restart a computer and configure boot parameters in UEFI/BIOS Setup
OS volume
Displays the drive and the disk partition where an OS is installed. To configure the parameter, restart a computer and configure boot parameters in UEFI/BIOS Setup
OS loader
Displays the full name of the selected OS loader (the file name and the path). To configure the parameter, restart a computer and configure boot parameters in UEFI/BIOS Setup
Trusted OS loader on removable drive

Allows you to use a removable drive as a trusted OS loader. Takes on the following values: • **ON** — trust to an OS loader specified in the **OS loader** parameter; • **OFF** — do not use a removable drive as a trusted OS loader. The default values is **OFF**. Note that: • this parameter is available only for a removable boot drive; • if you enable this parameter, an OS is loaded from the trusted boot drive despite booting from removable drives being forbidden for a user; • this parameter will be automatically set to **OFF** if you modify OS boot parameters
Model
Displays the model of the drive where an OS is installed. To configure the parameter, restart a computer and configure boot parameters in UEFI/BIOS Setup
Control serial number
Displays the serial number of the drive where an OS is installed and also allows you to control it. Takes on the following values: • **ON** — control the serial number of the system drive; • **OFF** — do not control the serial number of the system drive. The default value is **OFF**
Control connection port
Displays the port of the motherboard to which the hard drive with an installed OS is connected. Also allows you to control it. Takes on the following values: • **ON** — control the connection port; • **OFF** — do not control the connection port. The default value is **OFF**
System time and date
Displays the system time and date. Set the required time and date, if necessary

Configure general settings

The **General Settings** window is shown as in the figure below.



1. Configure Sobol general settings using the table below.

   Attention! The maximum number of users and log events and **Cryptographic kernel** parameters can be configured only during Sobol initialization. You cannot modify these parameters after you put Sobol into operation.

   To set the default values, select **Default**.
2. To save parameters and to go to the next step, select **Next**.

   To save parameters and to return to the previous step, select **Back**.

Tab. 4 The Sobol general settings

The maximum number of users and log events
Determines the maximum number of user accounts that can be created during Sobol operation and the maximum number of log entries considering the selected number of users. Takes on the following values: • **100 users, 3000 events**; • **200 users, 2000 events**; • **300 users, 1000 events**. The default value is **100 users, 3000 events** **Attention!** This parameter can be configured only during Sobol initialization. You cannot edit this parameter during Sobol operation.
The maximum number of RNG tests
Determines the number of attempts for testing RNG operation performed while a user logs on to the system. Takes on a value from **1** to **3**. The default value is **3**. If the first attempt is successful, the test is completed and Sobol continues its operation. If the number of attempts reaches the selected value, you receive a message of RNG testing error
Show statistics to user
Allows you to configure showing an information window after a user logs on to the system. Takes on the following values: • **ON** — show statistics to a user; • **OFF** — show statistics to a user. The default value is **OFF**
The maximum number of failed logon attempts
Determines the allowed number of failed logon attempts. Takes on a value from **0** to **255**. The default value is **10**. Note that: • If the parameter value is **0**, the number of failed logon attempts is not limited. • If the number of failed logon attempts of a user reaches the selected value, the user logon is blocked. • If a user logs on to the system successfully before the number of failed logon attempts reaches the selected value, the counter of failed logon attempts resets
Logon timeout
Determines the period of time (in minutes) for users to log on to the system. Takes on a value from **0** to **20**. The default value is **0**. Note that: • When a user logs on, the period of time to present a security token and type a password is shown on the screen. When the time expires, a user receives a message that current session is ended. • If the parameter value is **0**, there is no timeout. • If the **Automatic logon timeout** value is **0** (see the parameter below), **Logon timeout** is disabled
Automatic logon timeout

Determines the time period (in seconds) upon expiration of which automatic logon is performed. Takes on a value **0** or from **5** to **40**. The default value is **0**.
Note that:

- If the parameter value is **0**, a user/administrator cannot log on to the system without using personal security tokens.
- To use automatic logon, the AUTOLOAD user must be on the Sobol user list. If the AUTOLOAD user does not exist, **Automatic logon timeout** is disabled.
- If the AUTOLOAD user is on the Sobol user list and the **Logon timeout** value is **0** (see the parameter above), **Automatic logon timeout** is disabled

Watchdog timer timeout

Determines the period of time (in seconds) upon expiration of which a computer is automatically blocked if Sobol does not take control during this period.
Recommended timeout is determined during initialization and set as the default value.
An administrator can edit **Watchdog timer timeout** from the determined value to 65534

Note. When using Sobol without a monitor, we recommend setting the parameter value 7-10 seconds more than determined during the initialization. It is caused by long booting and potential watchdog timer activation before Sobol takes control.

Watchdog timer testing frequency

Determines the period of time (in days) during which the watchdog timer is tested. Takes on a value from **0** to **999**. The default value is **0**.
Note that:

- Testing is performed with the specified frequency when a user logs on to the system.
- If the parameter value is **0**, the testing is not performed

Sound

Allows you to configure playing a sound for the following events:

- logon countdown (see **Logon timeout** above);
- automatic logon without entering credentials;
- card diagnostics.

Takes on the following values:

- **ON** — play sound;
- **OFF** — do not play sound.

The default value is **OFF**

Cryptographic kernel

Determines the algorithm for checksum calculation. Takes on the following values:

- **1989** — GOST 28147-89 in MAC Generation Mode;
- **2015/2018** — the Magma algorithm (GOST R 34.12-2015, GOST 34.12-2018) in MAC Generation Mode (GOST R 34.13-2015, GOST 34.13-2018)

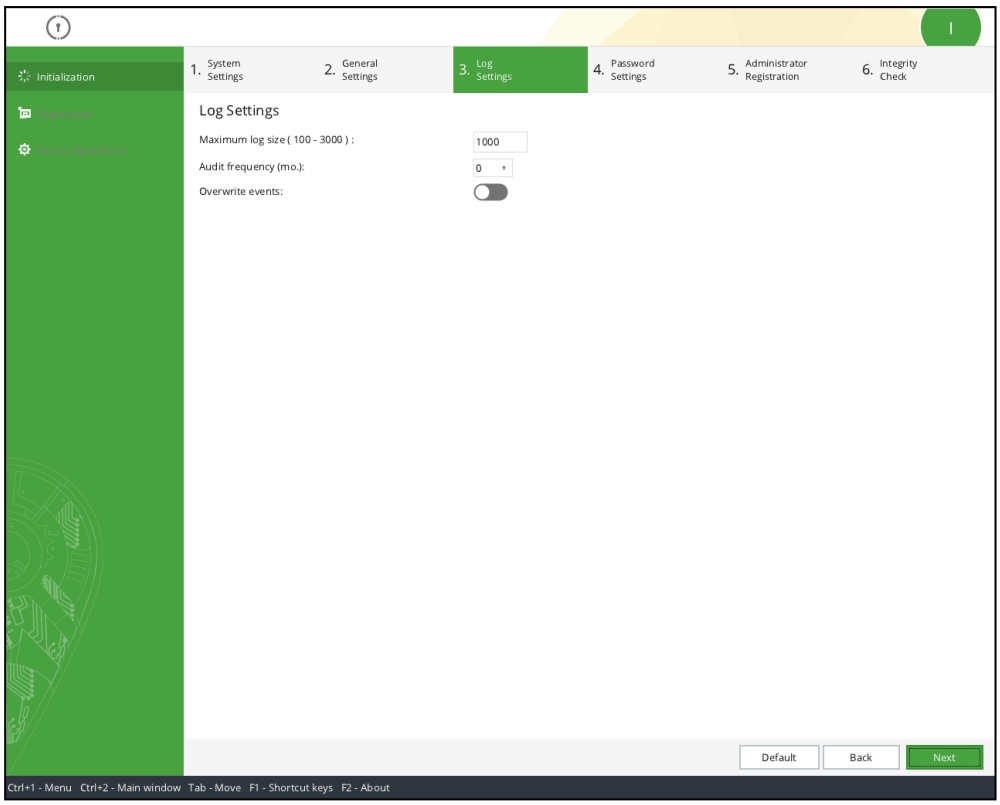
The default value is **1989**.

Attention!

- To use Sobol in joint mode and to ensure compatibility with the older versions, select **1989**.
- The administrator that operates with multiple Sobols must set the same value for this parameter.
- This parameter can be configured only during Sobol initialization. You cannot edit this parameter during Sobol operation.

Configure log settings

The figure below illustrates the **Log Settings** window.



1. Configure log settings using the table below.

   Note. You can configure log settings during Sobol initialization or operation (see p. 63).

   To return to the default parameters, select **Default**
2. To go to the next step, select **Next**.

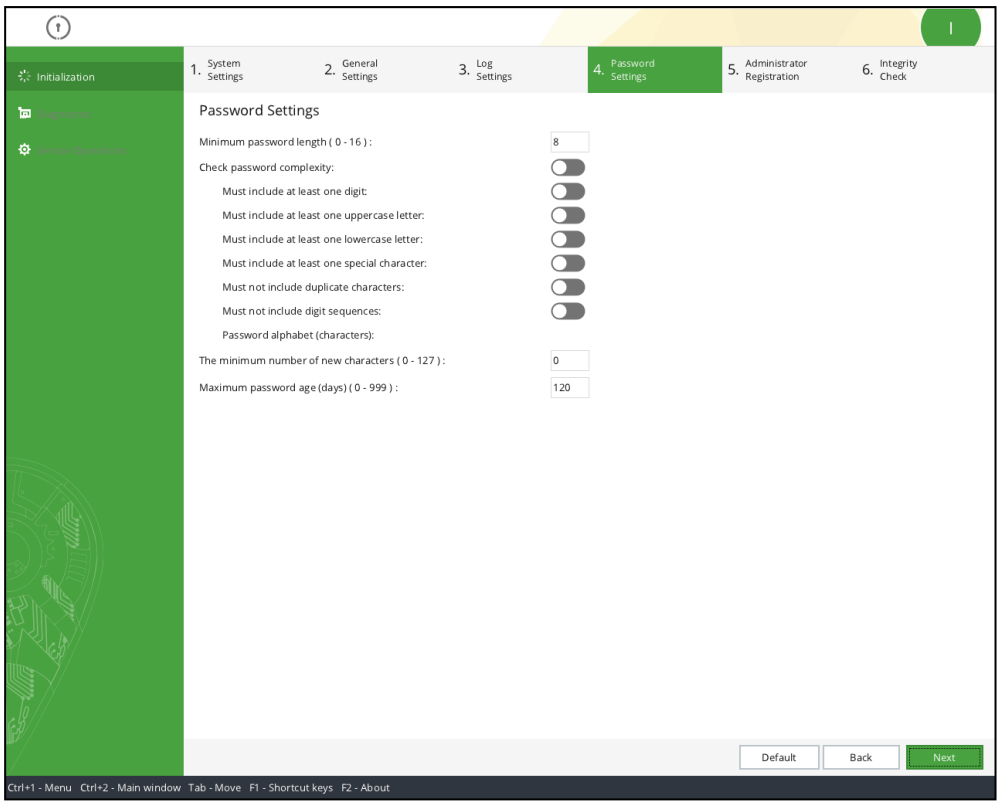
   To return to the previous step, select **Back**. In this case, all changes are saved.

Tab. 5 Sobol log settings

Maximum log size
Determines the number of events to be saved to the log. Its range depends on **The maximum number of users and log events** general parameter (see Tab. 4 on p. **25**). Takes on the following values: • from **100** to **3000**; • from **100** to **2000**; • from **100** to **1000**. The default value is **1000**
Audit frequency
Determines the period of time (in months) for performing an audit to the Sobol log. Takes on a value from **0** to **12**.The default value is **0**. Note that: • if the parameter value is 0, the audit is never performed; • if the value is from **1** to **12**, Sobol sends a warning prompting the administrator to perform an audit according to the selected value
Overwrite events
Enables overwriting events when log is 100% full. Takes on the following values: • **ON** — event overwriting is performed; • **OFF** — event overwriting is not performed. The default value is **OFF**

Configure password settings

The **Password Settings** window is shown as in the figure below.



1. Configure Sobol password settings using the table below.

   To set the default values, select **Default**.

> **Attention!**
>
> A password is complex if it meets the following requirements:
> - the password alphabet consists of 30 characters or more;
> - the password includes at least one digit;
> - the password includes at least one uppercase letter;
> - the password includes at least one lowercase letter;
> - the password includes at least one special character;
> - the password does not include duplicate characters;
> - the password does not include numerical sequences such as 123... and 987...;
> - a new password does not match the previous one.

2. To save parameters and to go to the next step, select **Next**.

   To save parameters and to return to the previous step, select **Back**.

Tab. 6 The Sobol password settings

Minimum password length
Determines the minimum length of the password (in characters). Takes on a value from **0** to **16**. The default value is 8. Note that: • If the parameter value is **0**, a user can have a blank password (a password will not be requested). • If the parameter value is from **0** to **5** and **Check password complexity** is **ON**, **Minimum password length** is set to 6; • If a user password length less than **Minimum password length**, the user must change the password when logging on to the system
Check password complexity

Allows you to configure password complexity check according to configured requirements (see the parameters below). Takes on the following values: • **ON** — check password complexity; • **OFF** — do not check password complexity. The default value is **OFF**. When the value is **ON**, all password complexity parameters (see below) are set to **ON**
Must include at least one digit
Must include at least one uppercase letter
Must include at least one lowercase letter
Must include at least one special character
Must not include duplicate characters
Must not include digit sequences
Allows you to establish requirements for password complexity. Takes on the following values: • **ON** — establish the requirement; • **OFF** — do not establish the requirement. If **Check password complexity** is **OFF**, these parameters are disabled. When **Check password complexity** is set to **ON**, the parameters are set to **ON** automatically
Password alphabet
Displays the number of characters that can be used in a password. The parameter value is counted automatically when requirements for password complexity are established (see the parameters above)
The minimum number of new characters

Determines the number of characters which must be changed in a new password compared to the old one. Takes on a value from **0** to **127**. The default value is **0**.
Note that:
• if the parameter value is 0, the same password can be set again;
• if the parameter value is bigger than **Minimum password length**, a valid new password must meet the following requirements:
  • length of the new password must not be less than **The minimum number of new characters**;
  • all characters of the new password must be different from the respective characters of the old password

Maximum password age
Determines the period of time (in days) during which the password is valid. Takes on a value from **0** to **999**. The default value is **120**. Note that: • If the parameter value is **0**, the password age is not limited. • When the password age expires, the password is no longer valid. A user must change a password when logging on to the system. • The period of time applies to the user Secure ID, if **Change Secure ID while changing password** is **ON** for this user (see Tab. 7 on p. **54**). • The period of time applies only to users with enabled **Limit password age** (see Tab. 7 on p. **54**)

Administrator registration

Attention! After the administrator registration you cannot return to the previous steps.

While registering, the administrator receives the following credentials:

- a Secure ID and a password;
- a security token.

For detailed information about the initial registration, see p. **30**.

For detailed information about the registration, see p. **30**.

During the initial registration, new registration data is recorded on the security token. If the security token already contains data (e.g. data recorded during the initialization of another Sobol), it is deleted and the administrator cannot control another Sobol.

At the registration, service information recorded during the initial registration is read without being changed. It allows the administrator to use the same security token to log on to the system on different computers with Sobol.

Attention! To repeat the administrator registration, select the cryptographic kernel similar to one that was selected during the initial registration (see p. **26**).

When you go to this step the window appears as in the figure below.

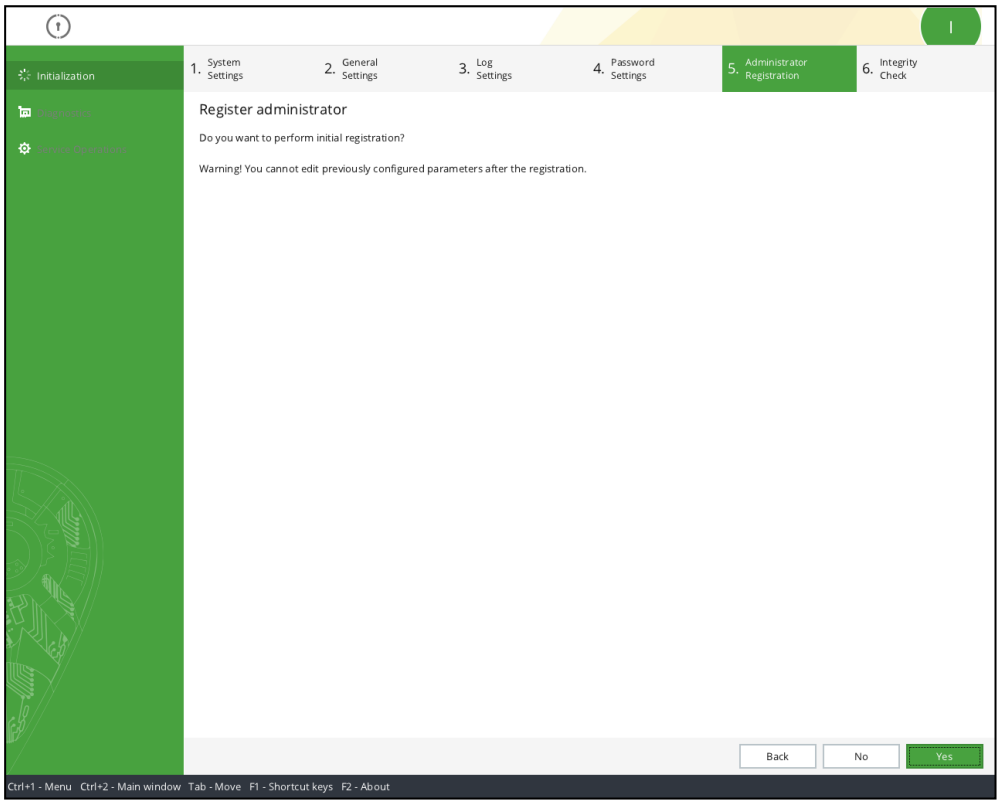


Fig. 12 The Register administrator window

For detailed information about the initial registration, see below.

For detailed information about the registration, see p. **30**.

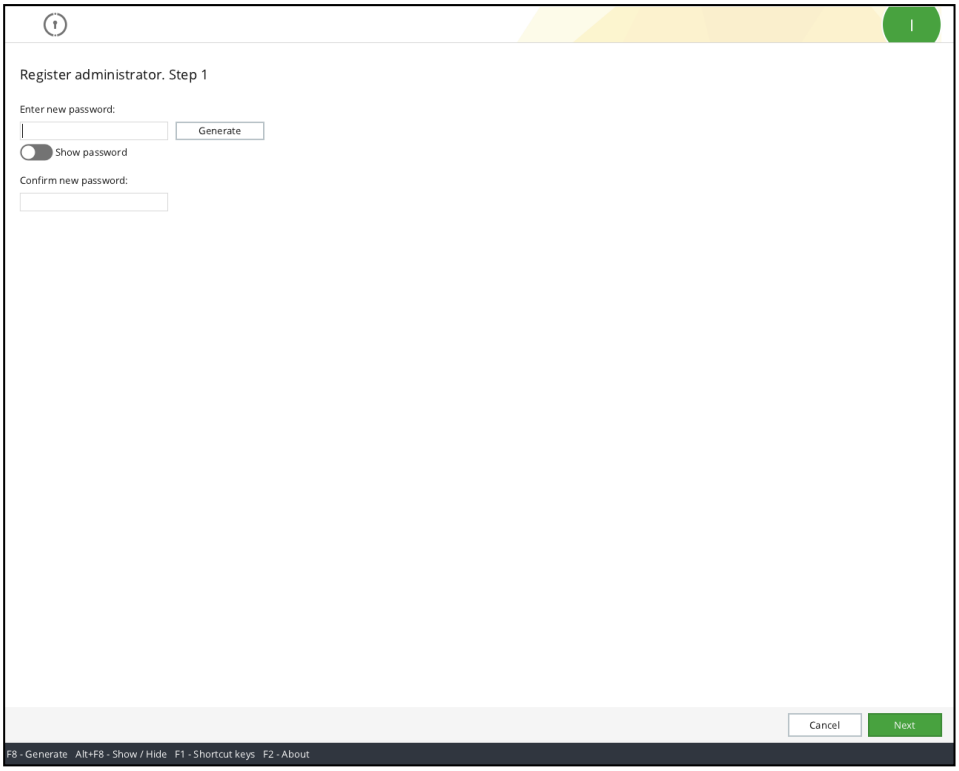
Initial registration

Tip. Before starting the initial registration, prepare the required number of security tokens including tokens for creating backups of the administrator security token.We recommend creating at least one backup.

To start the initial registration:

1. In the **Register administrator** window (see Fig. 12 on p. **30**), select **Yes**, then select **Next**.

   The window appears as in the figure below.



2. In the **Enter new password** text box, type a new password that meets the requirements (see below) or generate a random password automatically selecting **Generate**.

Note. A password must contain only the following characters:
- 1234567890 — digits;
- abcdefghijklmnopqrstuvwxyz — lowercase Latin letters;
- ABCDEFGHIJKLMNOPQRSTUVWXYZ — uppercase Latin letters;
- _$!@#;%^:&?*)(-+=/|.,<>`~"\ — special characters.

If password complexity check is enabled, a password must meet the complexity requirements set at the **Password Settings** step of the initialization (see p. 27).

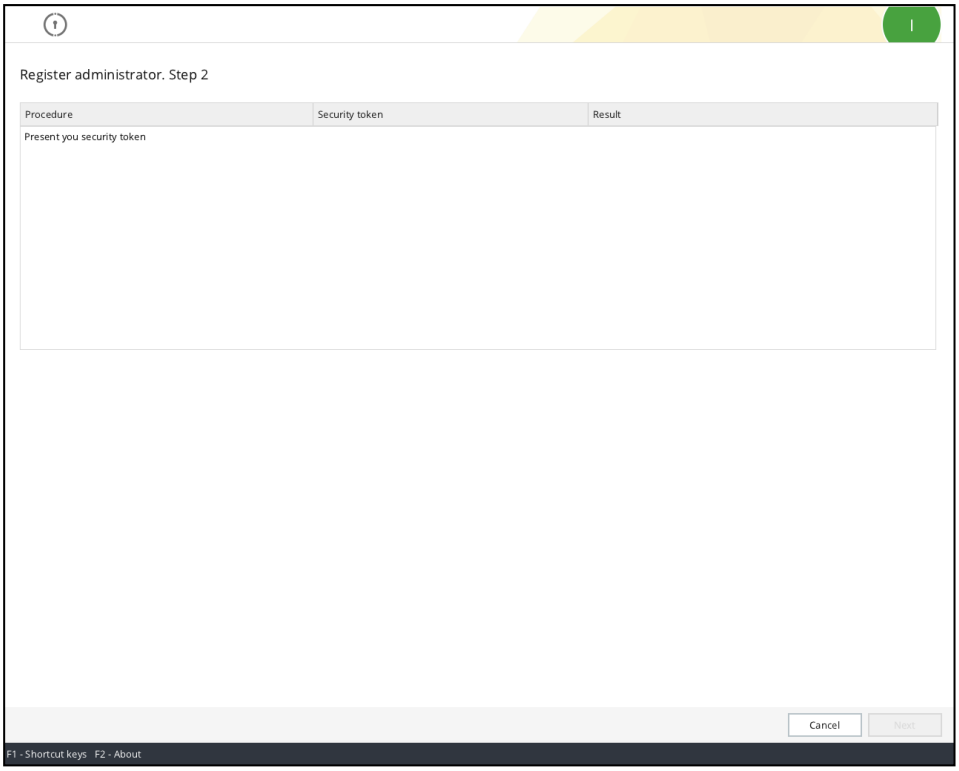
To view the password, press **<Alt>** + **<F8>** or turn on the Show password toggle.

Note. While generating a random password, note that:
- to generate a new random password, press **<F8>** or select **Generate**;
- if password complexity check is enabled, a password meets the complexity requirements set at the **Password Settings** step of the initialization (see p. 27);
- if password complexity check is disabled, a generated password consists of digits and lowercase Latin letters;
- you can edit the password generated by Sobol.

3. In the **Confirm new password** text box, type the password again.
4. Select **Next**.

Note. If an error occurs, you receive a message with an error description.(see p. 92). Select **OK** and enter the correct password.

After you enter the password, you are prompted to present a security token.

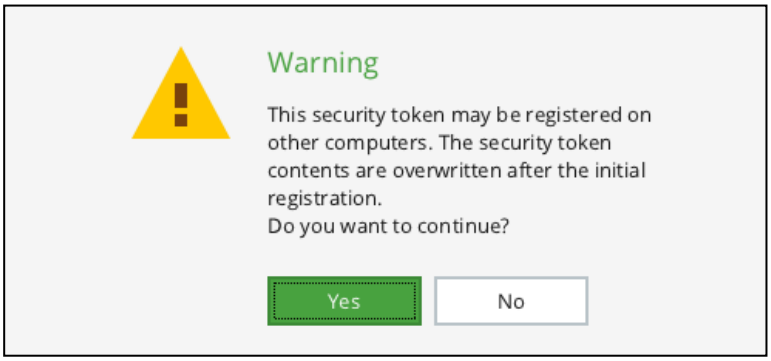


5. Present a security token to be assigned to the administrator.

Note.

- If a security token is already presented (iButton is in contact with the reader / USB key is attached / smart card is in contact with the reader), Sobol automatically reads it.
- If several security tokens are presented, Sobol reads the first one being detected.
- If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

- If a security token is presented incorrectly, present it again.
- If a security token has already been registered on the other computer and contains service information, the dialog box appears as in the figure below.



If you are sure that the security token is no longer used by anyone, select **Yes** and present the security token again.

Attention! When you record information to the security token service information contained on it will be deleted permanently. The user who owns this security token will no longer be able to use it to log on to the system.

If you want to use another security token, select **No** and repeat step **5**.

- If the data structure of the security token is corrupted, you receive a message about an error prompting you to format the security token.

Attention! To repair the data structure of the security token, you need to format it.
When formatting iButton you lose all the information contained on it. When formatting a USB key/smart card, the information about Sobol and programs using it is lost.

To format a security token, select **Yes** in the respective dialog box. The security token will be formatted and prepared for further work.

To continue without formatting, select **No** and present another security token.

Tip. You can format a security token later using Format security token (see p. 71).

After the administrator is assigned with a personal security token, you receive the respective message. To create a security token backup, select **Back up**.

Note. Security token backups can be used by the administrator for emergency logon to the system in case the original security token is is damaged or lost. We recommend creating at least one backup.

6. To continue, select on of the following options:
   - if you are sure that the backups are not necessary, go to step **9**;
   - to create a security token backup, select **Back up**.

     The respective dialog box appears.
7. Present the security token for backup.

   Note. If you receive any messages, take step **5**.

   When the backup is created, you receive the respective message.
8. Repeat step **6**.
9. Select Next.

Registration

At the registration, service information recorded during the initial registration is read without being changed. It allows the administrator to use the same security token to log on to the system on different computers with Sobol.

To start the registration:

1. In the **Register Administrator** window (see Fig. 12 on p. **30**) select **No**.

   A dialog box prompting you to enter an administrator password appears.
2. Enter the password assigned to the administrator during the initial registration for another Sobol and select **Next**.

   A dialog box prompting you to present a security token appears.
3. Present the security token assigned to the administrator during the initial registration for another Sobol.

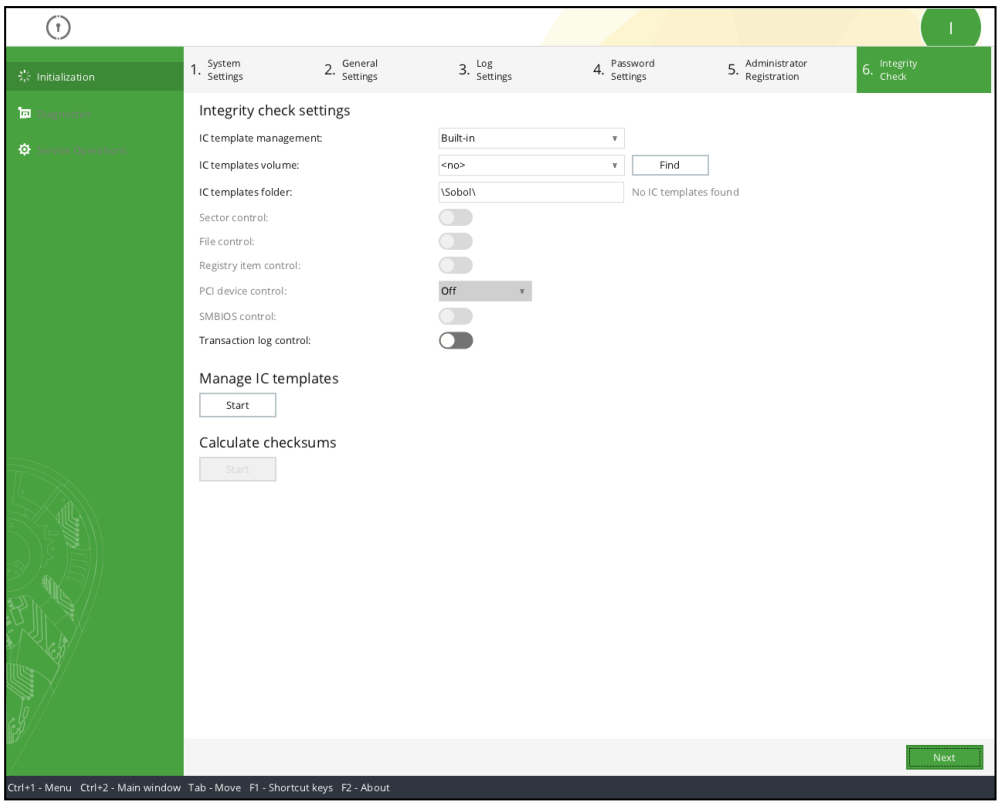
   Note.
   - If a security token is already presented (iButton is in contact with the reader / USB key is attached / smart card is in contact with the reader), Sobol automatically reads it.
   - If several security tokens are presented, Sobol reads the first one being detected.
   - If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

   If the security token is valid, Sobol checks if the entered password matches the information stored on the security token:
   - If the entered password is incorrect or the presented security token is not assigned to the administrator, you receive the respective message.

     Select **OK**. In the **Register Administrator. Step 2** window, select **Cancel**. You receive a message promting you to select the type of administrator registration (see Fig. 12 on p. **30**);
   - if the entered password matches the presented security token, the service information is read and recorded to the nonvolatile memory of Sobol.To go to the next step, select **Next**. To return to the previous step, select **Back**.

Configure IC settings and calculate checksums

The figure below illustrates the **Integrity Check Settings** window.



1. In the **IC template management** drop-down list, select one of the following options:
   - **Sobol software** — using Sobol software;

     Note. Sobol software is installed on and used in an OS. For more details, see [2].
   - **Built-in** — using built-in IC template management.

     Note. To manage IC template using built-in IC template management, select **Start** in **Manage IC templates** group box and follow the instructions on p. 75.
2. In the **IC templates volume** drop-down list and the **IC templates folder** text box, specify the required options in one of the following ways:
   - select **Find**. Sobol searches for IC templates in standard folders (see below). If there are IC templates, their values are set automatically.

     Note.
     - The standard folder for Windows is **\Sobol**.
     - The standard folder for Linux are **/sobol** and **/boot/sobol**.
     - If the standard folders are not found or do not contain IC templates, you receive a message about an error. For details, see p. 93.
   - If IC templates are created in other folders, select an IC template volume from the respective drop-down list and enter the path to the required folder in the **IC templates folder** text box.

     Note. For folders on FAT16 and FAT32 drives, specify long names (more than 8 characters) in a short form, e.g. progra~1.To find out the short form of the name, use the DIR command or file managers, e.g. Total Commander.

   If the folder with IC templates is found and these templates are valid , the IC parameters are available for editing.

   Note.
   - The **Sector control**, **File control**, **Registry item control**, **SMBIOS control** parameters are enabled.
   - The **PCI device control** parameter is set to **Basic**.
3. Enable IC for the required objects:

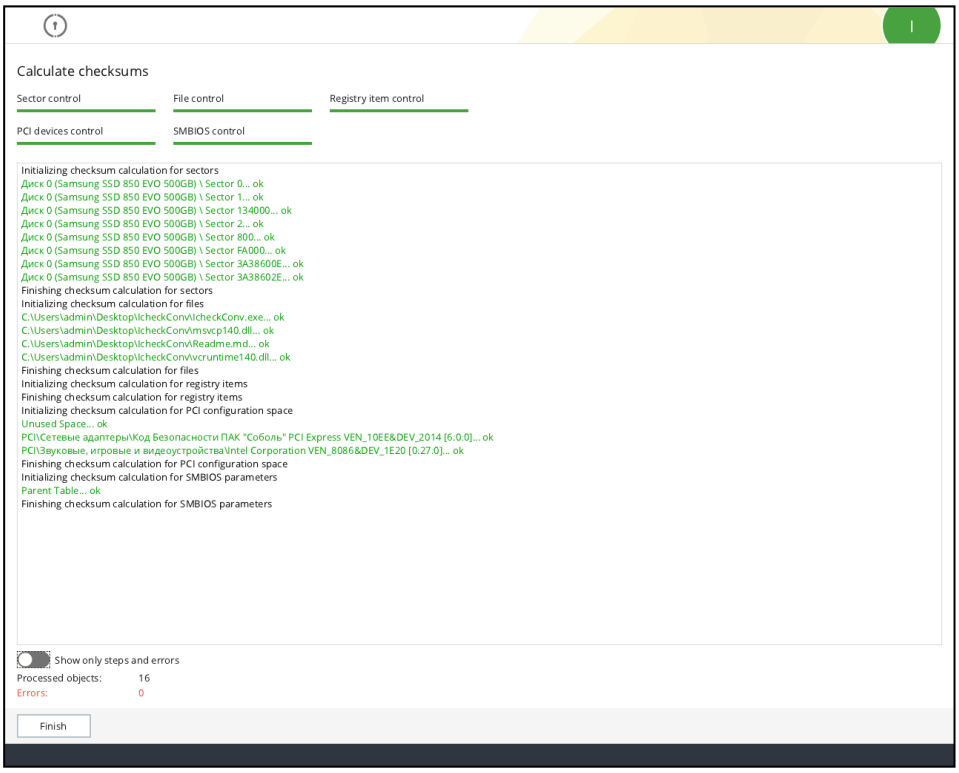
- to enable IC for disk sectors / files / registry items / SMBIOS structures, turn on the **Sector control**, **File control**, **Registry item control**, **SMBIOS control** toggles;
- to enable IC for PCI devices, in the **PCI device control** drop-down list, select the required option (**Off** / **Basic** / **Optimal** / **Advanced**, see Tab. 2 on p. 9, **PCI devices**);
- to enable IC for a transaction log, turn on the **Transaction log control** toggle.

4. Configure the **IC key update frequency** parameter:
   - to update the IC key automatically, specify the number of days until the next update (from 1 to 999);
   - to disable IC key update, set **0**.

Note.
- The parameter is available only if you select cryptographic kernel version 2015/2018 when configuring general settings during Sobol initialization (see p. 26).
- The default value of the parameter is **0**.

5. Calculate the reference checksums for IC objects. To do so, select **Start** in the **Calculate checksums** section.

   The calculation process is displayed on the screen.



Note.
- The process color indicators:
  - green – successful checksum calculation;
  - red – errors during checksum calculation;
  - black – messages.
- By default, Sobol shows only errors and calculation process steps. To view all the calculation results, turn off the **Show steps and erorrs** toggle

If an error occurs, the message with its description appears. Read the message and select **OK**. For more details about errors, see p. **93**.

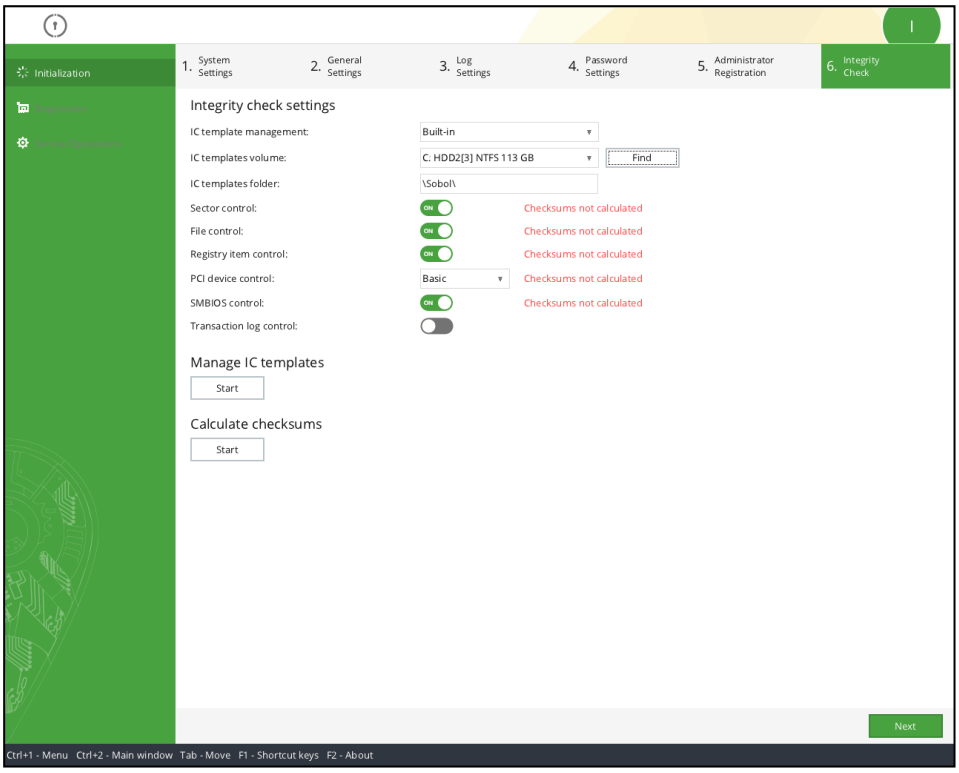
Tip. If you do not need any notifications about checksum calculation, select the **Don't ask again** check box.

To interrupt the checksum calculation, press <**Esc**> or select **Cancel**.

6. When the checksum calculation is completed, check the results and select **Finish**.

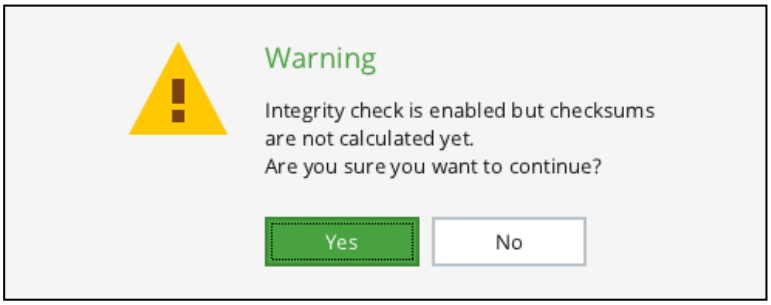
> **Note.** If you have enabled IC for PCI devices, then disconnect a controlled device from a PCI bus, a group of error messages may occur during the checksum recalculation. In this case, pay attention only to the **Not found** error messages. Other error messages from the group occur due to special characteristics of assigning addresses to PCI devices in UEFI: when you delete a device and restart the computer, configuration data and device addresses may change.

The **Integrity Check** window appears. If the checksum calculation for an IC object is completed with an error, a message appears next to the respective parameter of the object.



7. In the **Integrity Check** window, select **Next**.

If an error occurred during the checksum calculation, the respective message appears.



To complete the initialization, select **Yes**.

> **Note.** To return to IC settings configuration and checksum calculation, select **No**.

Complete initialization

When the initialization is completed, the respective message appears. If necessary, put Sobol into operation.

To complete the initialization:

1. Select **OK**. The computer shuts down automatically.
2. Put Sobol into operation (see below).

Putting Sobol into operation

To put Sobol into operation using a PCIe card:

1. Shut down your computer. Remove the side panel.
2. If the iButton reader is attached to the Sobol card, remove it:
   - if you use the external reader, remove it from the Sobol card socket on the back of the system unit;
   - if you use the internal reader, remove it from the TM connector.
3. Remove the Sobol card from the PCIe slot.
4. Switch SW1-1 to the ON position (see Fig. 2 on p. **14**).
5. Insert the Sobol card into a free PCIe slot.
6. If necessary, attach an iButton reader to the Sobol card:
   - for the external iButton reader, attach it to the respective socket;
   - for the internal iButton reader, attach it to the TM connector.
7. Put the side panel back.

When all the steps above are taken, shut down the computer and start configuring Sobol (see p. **41**).

To put Sobol into operation using a Mini PCIe Half card:

1. Shut down your computer. Remove the side panel.
2. Put the Sobol card into operation. To do so, switch S1-1 to the ON position (see Fig. 5 on p. **18**).
3. Put the side panel back.

When all the steps above are taken, shut down the computer and start configuring Sobol (see p. **41**).

To put Sobol into operation using an M.2 card:

1. Shut down your computer. Remove the side panel.
2. Put the Sobol card into operation. To do so, switch SW1-1 to the ON position (see Fig. 10 on p. **21**).
3. Put the side panel back.

When all the steps above are taken, shut down the computer and start configuring Sobol (see p. **41**).

Remove Sobol

To remove Sobol, take the following steps:

- remove the Sobol software if it was installed;

  Note. For more details about Sobol software removal, see [2].

- remove the Sobol card from the computer (see p. **37** for PCIe, p. **39** for Mini PCIe Half, p. **39** for M.2).

Attention! After removing Sobol, all the service information about its configuration is stored in the nonvolatile memory of the Sobol card. Thus, you can install and use Sobol without initialization if the administrator and user security tokens contain registration information. After removing Sobol, the administrator must store the Sobol card the way that prevents it from unauthorized physical access.
To delete service information from the Sobol memory, perform the initial registration during the initialization (see p. **21**).

Remove a PCIe card

To remove a PCIe card:

1. Shut down your computer. Remove the side panel.
2. If the iButton reader is attached to the Sobol card, remove it:

- if you use the external reader, remove it from the Sobol card socket on the back of the system unit;
- if you use the internal reader, remove it from the TM connector (see Fig. 2 on p. **14**).

3. Remove the Sobol card from the PCIe slot.
4. If the watchdog timer enables forced automatic restart of the computer, take the following steps:
   - disconnect RST watchdog cable from the WD connector of Sobol card (see Fig. 2 on p. **14**) and from the Reset connector on the motherboard;
   - disconnect the Reset button cable from the Reset connector on the Sobol card (see Fig. 2 on p. **14**) and connect it to the Reset connector on the motherboard;
   - disconnect the power cable from the SATA connector (see Fig. 2 on p. **14**).
5. If the watchdog timer enables forced automatic shutdown of the computer, take the following steps:
   - for the 24-ATX connector:
     - disconnect the X1 connector (see B), Fig. 1 on p. **11**) from the RL connector on the PCIe card (see Fig. 2 on p. **14**);
     - disconnect the X2 and X6 connectors from the ATX connector on the motherboard;
     - disconnect the X5 connector from the X3 connector;
     - disconnect the power cable from the X4 connector of the ATX cable watchdog relay;
     - connect the power cable to the ATX connector on the motherboard;
     - disconnect the power cable from the SATA connector on the PCIe card (see Fig. 2 on p. **14**);
   - for the 20-ATX connector:
     - disconnect the X1 connector (see B), Fig. 1 on p. **11**) from the RL connector on the PCIe card (see Fig. 2 on p. **14**);
     - disconnect the X2 connector from the ATX connector on the motherboard;
     - disconnect the power cable from the X3 connector of the ATX cable watchdog relay;
     - connect the power cable to the ATX connector on the motherboard;
     - disconnect the power cable from the SATA connector on the PCIe card (see Fig. 2 on p. **14**);
   - for the PWR watchdog cable:
     - disconnect the PWR watchdog cable from the WD connector on the Sobol card (see Fig. 2 on p. **14**) and from the T-Tap connectors (see C), Fig. 1 on p. **11**). Keep the connectors folded over the wires of the Power button cable to provide isolation;
     - disconnect the power cable from the SATA connector on the PCIe card (см. Fig. 2 on p. **14**);
   - for connecting the RST watchdog cable to the Power button cable in parallel:
     - disconnect the RST watchdog cable from the WD connector on the PCIe card (see Fig. 2 on p. **14**). Keep the connectors folded over the wires of the Power button cable to provide isolation;
     - disconnect the power cable from the SATA connector on the PCIe card (see Fig. 2 on p. **14**).
6. Put the side panel back.

Remove a Mini PCIe Half card

To remove an adapter and a Mini PCIe Half card:

1. Shut down your computer. Remove the side panel.
2. If an iButton reader is attached to the adapter, remove it:
   - if you use the external reader, remove it from the required connector of the adapter (see Fig. 6 on p. **18**, Fig. 7 on p. **18** or Fig. 8 on p. **19**);
   - if you use the internal reader, remove it from the TM connector of the adapter(see Fig. 6 on p. **18** or Fig. 9 on p. **19**).
3. Remove the card from the Mini PCIe slot.
4. Remove the adapter from the slot of the system unit.
5. If the watchdog timer enables forced automatic restart of the computer, take the following steps:
   - disconnect the RST watchdog cable from the WD connector (see Fig. 6 on p. **18**, Fig. 7 on p. **18**, Fig. 8 on p. **19** or Fig. 9 on p. **19**) and the Reset connector on the motherboard;
   - if you use the type 1 adapter, disconnect the Reset button cable from the RST connector (see Fig. 6 on p. **18**) and connect the Reset cable to the Reset connector on the motherboard.
6. If the watchdog timer enables forced automatic shutdown of the computer, take the following steps:
   - for the PWR watchdog cable:
     - disconnect the PWR watchdog cable from the WD connector (see Fig. 6 on p. **18**, Fig. 7 on p. **18**, Fig. 8 on p. **19** or Fig. 9 on p. **19**) and from the T-Tap connectors (see. C, Рис.1 на стр.**1**). Keep the connectors folded over the wires of the Power button cable to provide isolation;
   - for connecting the RST watchdog cable to the Power button cable in parallel:
     - disconnect the RST watchdog cable from the WD connector (see Fig. 6 on p. **18**, Fig. 7 on p. **18**, Fig. 8 on p. **19** or Fig. 9 on p. **19**). Keep the connectors folded over the wires of the Power button cable to provide isolation;
7. Put the side panel back.

To remove a Mini PCIe Half card:

1. Shut down your computer. Remove the side panel.
2. Remove the card from the Mini PCIe slot.
3. Put the side panel back.

Remove an M.2 card

To remove an adapter and an M.2 card:

1. Shut down your computer. Remove the side panel.
2. If the iButton reader is attached to the adapter, remove it:
   - if you use the external reader, remove it from the required connector of the adapter (see Fig. 6 on p. **18**, Fig. 7 on p. **18** or Fig. 8 on p. **19**);
   - if you use the internal reader, remove it from the TM connector of the adapter(see Fig. 6 on p. **18** or Fig. 9 on p. **19**).
3. Remove the card from the M.2 slot.
4. Remove the adapter from the slot of the system unit .
5. If the watchdog timer enables forced automatic restart of the computer, take the following steps:

- disconnect the RST watchdog cable from the WD connector (see Fig. 6 on p. **18**, Fig. 7 on p. **18**, Fig. 8 on p. **19** or Fig. 9 on p. **19**) and the Reset connector on the motherboard;
- if you use the type 1 adapter, disconnect the Reset button cable from the RST connector (see Fig. 6 on p. **18**) and connect the Reset cable to the Reset connector on the motherboard.

6. If the watchdog timer enables forced automatic shutdown of the computer, take the following steps:
   - for the PWR watchdog cable:
     - disconnect the PWR watchdog cable from the WD connector (see Fig. 6 on p. **18**, Fig. 7 on p. **18**, Fig. 8 on p. **19** or Fig. 9 on p. **19**) and from the T-Tap connectors. Keep the connectors folded over the wires of the Power button cable to provide isolation;
   - for connecting the RST watchdog cable to the Power button cable in parallel:
     - disconnect the RST watchdog cable from the WD connector (see Fig. 6 on p. **18**, Fig. 7 on p. **18**, Fig. 8 on p. **19** or Fig. 9 on p. **19**). Keep the connectors folded over the wires of the Power button cable to provide isolation;
7. Put the side panel back.

To remove an M.2 card:

1. Shut down your computer. Remove the side panel.
2. Remove the card from the M.2 slot.
3. Put the side panel back.

Chapter 3
Sobol setup and use

Before you use Sobol, you must log on to the system (for more information, see below), register Sobol users (see p. **50**) and set up their accounts (see p. **54**).

With Sobol you can:

- manage OS boot options (see p. **46**);
- configure general Sobol settings (see p. **48**);
- configure password settings (see p. **49**);
- configure a user list and account settings (see p. **50**);
- change your password (see p. **61**)and your Secure ID (see p. **59**);
- change user passwords and Secure IDs (see p. **56**);
- work with the log (see p. **63**);
- manage integrity check (see p. **58**);
- control the operability of Sobol (see p. **67**);
- perform a number of service operations.

For instructions on how to complete Sobol configuration, see p. **74**

Log on as an administrator

Attention! Before you log on to the system, disconnect all USB Mass Storage devices (flash drives, CD and DVD drives, etc) from computer USB ports.

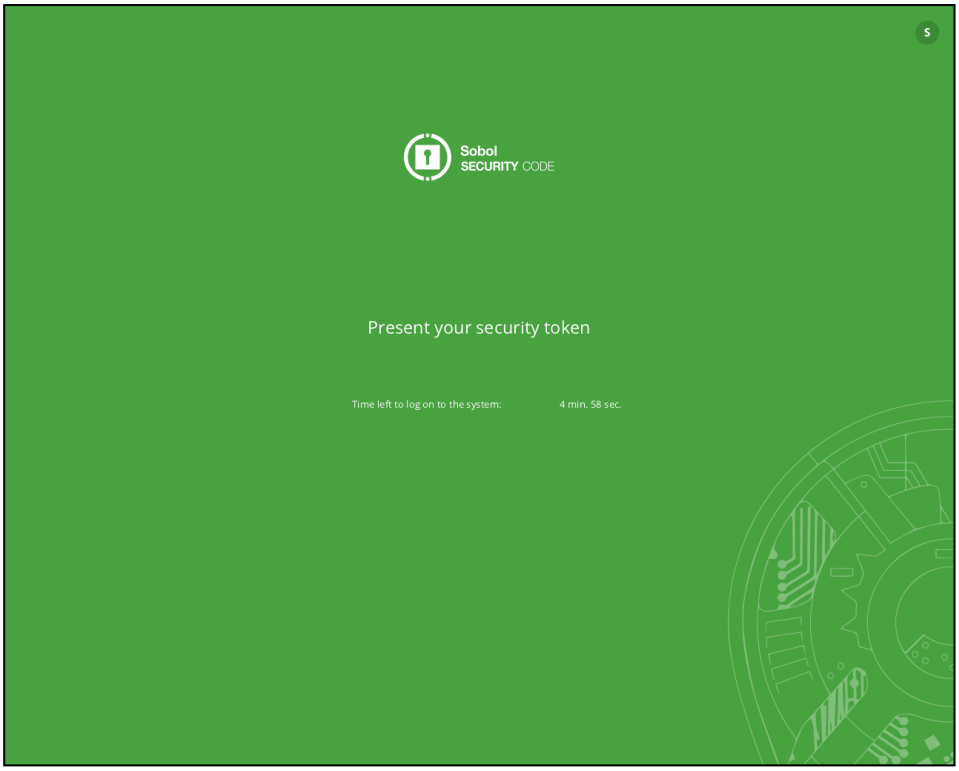
To log on to the system as administrator:

1. Turn on or reboot the computer.

   Sobol takes control over the process. The RNG and card memory tests begin.

   Note. While Sobol is loading, errors may occur. As a rule, they result in computer locking before the RNG test. The error message appears respectively. You can find the list of possible errors and the steps to eliminate them on p. **90**.

   After the tests are completed, the window requesting the security token appears.



In the top right corner of the window, the Sobol mode is indicated: **S** — the standalone mode, **J** — the joint mode.

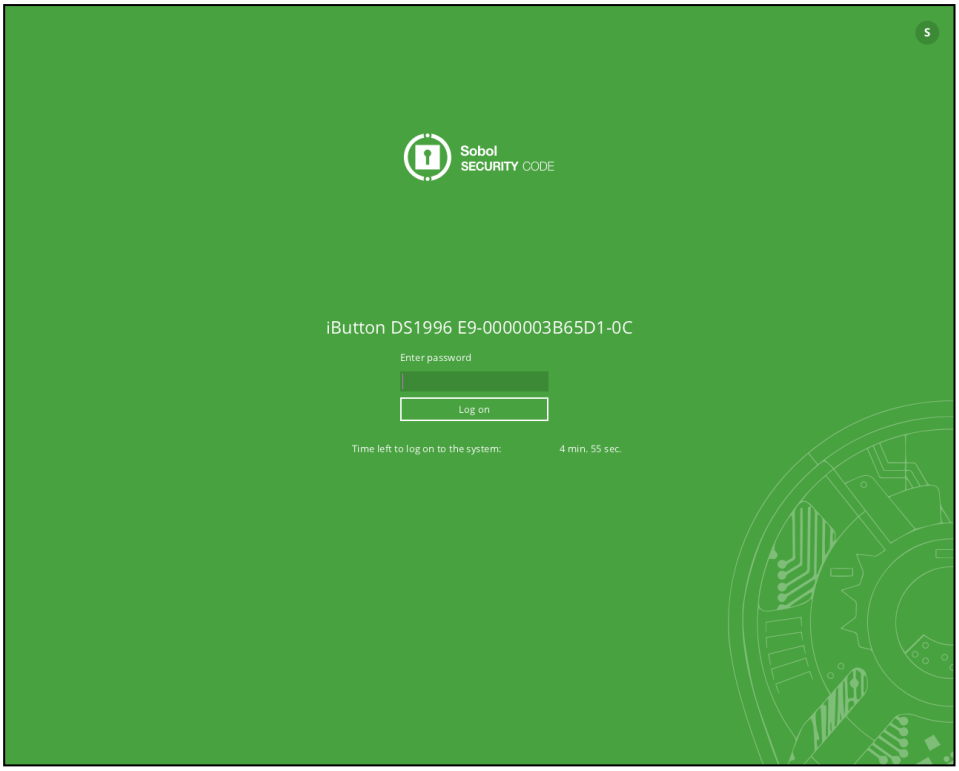
Note. If the logon timeout mode is on (see p. 24), the time left to enter the password and to present the security token is displayed in the respective window. The computer is to be locked unless you perform these actions in time. If so, reboot the computer and repeat the logon.

2. Present your administrator security token.

Note.

- If you presented the security token (the IButton key touches the reader / the USB key is in the USB port / the smart card is in the USB smart card reader), Sobol reads it automatically. The serial number of the security token is displayed.
- If several security tokens are presented at once, the serial number of the first one is displayed. To change the security token, press <**Esc**>.

After the security token information is read, the dialog prompting you to enter the password appears.



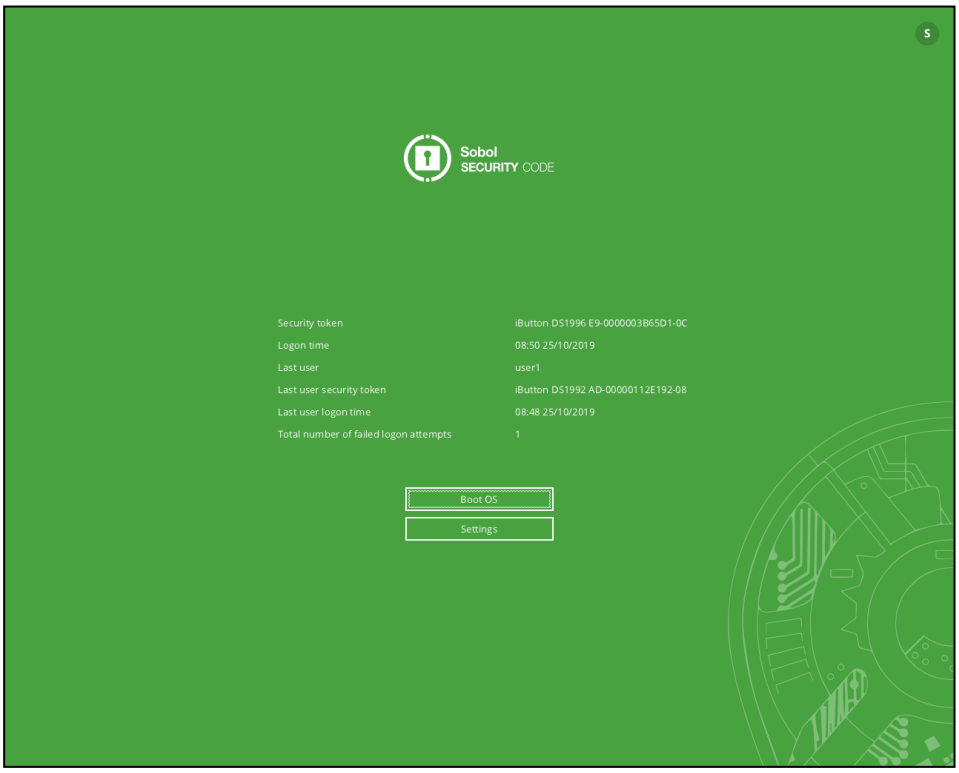
3. Enter the administrator password.

Note. To refuse to enter the password, press <**Esc**>. The request to present a security token appears again.

4. Select **Log on**.

Note. If you present an unregistered security token or enter a wrong password, Sobol displays the **Wrong security token or password** warning. Press any button and repeat steps **2–4** of this procedure.

After you enter the correct password, the following window appears.



The information window contains the following:

Security token	The number and type of the security token presented during the logon
Logon time	The time (HH:MM) and the date (DD/MM/YYYY) when the administrator entered the password during the current logon
Last user	The name of the last Sobol user who logged on before the current administrator logon. No information if a registered user did not log on to the system or if his or her account was deleted from the Sobol user list after the logon.
Last user security token	The number and type of the security token of a user logged on to the system last before the current administrator logon. No information if the name of the previous user was not specified
Last user logon time	The time (HH:MM) and the date (DD/MM/YYYY) of the last user logon before the current administrator logon. No information if the name of the previous user was not specified
Total number of failed logon attempts	The number of mistakes made by users when attempting to log on to the system. The number is counted after the last Sobol initialization. The mistakes are incorrect security token presentation and a wrong password. No information if no mistakes were made

5. Select the way to continue the procedure:
   - Select **Boot OS** to boot the operating system.

     Note. If log audit is enabled (see Tab. 5 on p. 27, the **Time period for audit** parameter) and the warning about the audit necessity appears, the **Boot OS** button is unavailable. Select **Settings**. The event logging window appears on the screen. (Fig. 17 on p. 63).

     If integrity check is enabled, the integrity of specified objects is checked before the operating system boots.

     Note.
     - To suspend the check, press <**Esc**> or select **Stop**.
     - If an error occurs, the respective message appears. Read the message (you can find the list of error messages on p. 93). To continue the check, select **OK**.
     - If you do not need Sobol notifications, in the error message window, select **Don't ask again**.
     - After the check is complete and the operating system boots, eliminate the causes of errors. Then, calculate the checksums of objects again (see p. 58).

     After the integrity check is complete, select **Finish** . The operating system boots.
   - To configure Sobol, select **Settings**.

     The administrator menu appears as in the figure below.

Administrator menu

The Sobol administrator menu appears as follows.

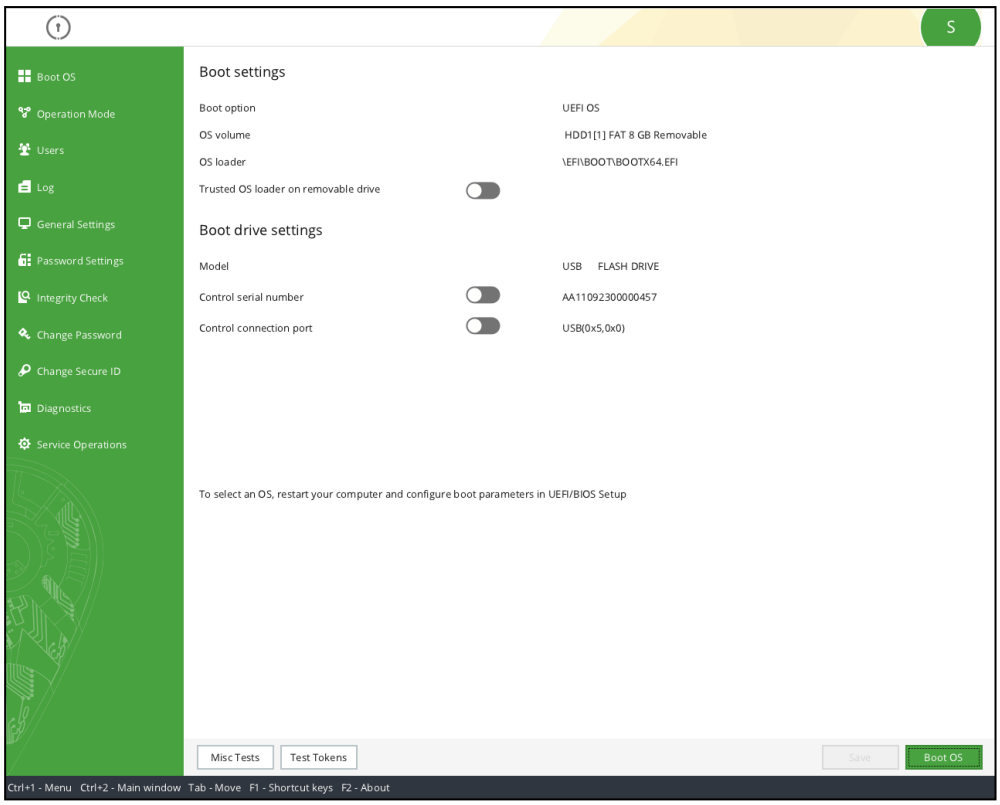


Fig. 13 Sobol administrator menu

The letter in the top right corner of the menu indicates the operation mode: **S** — the standalone mode, **J** — the joint mode.

The menu on the left contains commands available to the administrator when Sobol operates.

Note. Some commands are unavailable if Sobol is in joint mode. For more information about configuring Sobol in this mode, see p. 97.

The main area of the window on the right of the operation menu displays information about a performed command (the implementation status, parameters, messages, etc) and control keys.

The information bar in the bottom of the window displays keyboard shortcuts.

Use the left mouse button or the following keys:

- <**Ctrl**>+<**1**>/<**Ctrl**>+<**2**> — set the cursor in the menu / in the main area of the window;
- <**Tab**> — move the cursor from one menu item or a parameter to another;
- <**Enter**> — select a menu item or a parameter;
- < **Space** > — change a parameter value (enter the new value using the keyboard when necessary);
- <**F2**> — view information about Sobol(see p. **99**).

Note. You can use additional control keys when configuring Sobol. To view the list of control keys, press <F1>.

Select an item of the administrator menu, follow the instructions referred to below and configure Sobol.

- **Boot OS** — view the OS boot parameters and configure the boot drive parameter control (see p. **46**);
- **Operation mode** — change Sobol operation mode (see p. **46**);
- **Users** — manage Sobol users (see p. **50**);
- **Log** — work with the log (see p. **63**);
- **General settings**— configure Sobol general settings (see p. **48**);

- **Password settings**— configure Sobol password settings (see p. **49**);
- **Integrity check** — configure integrity check settings, calculate integrity check object checksums (see p. **58**), run IC templates management software (see p. **75**);
- **Change password**— change the administrator password (see p. **59**);
- **Change Secure ID** — change the administrator security token (see p. **59**);
- **Diagnostics** — check Sobol operability (see p. **67**);
- **Service operations** — create a backup and format the security token, initialize Sobol, save and update UEFI Option ROM (see. p. **68**).

Boot OS

The **Boot OS** menu item (see Fig. 13 on p. **45**) contains OS and disk boot options as well as the button for OS booting.

Attention!

- If you boot from network cards, the system settings differ from ones shown in Fig. 13 on p. **45**.
- If you change boot option in UEFI/BIOS setup, you receive the respective message and the Save button appears in the **Boot option** window. To save new parameters, select **Save**.

To configure the options:

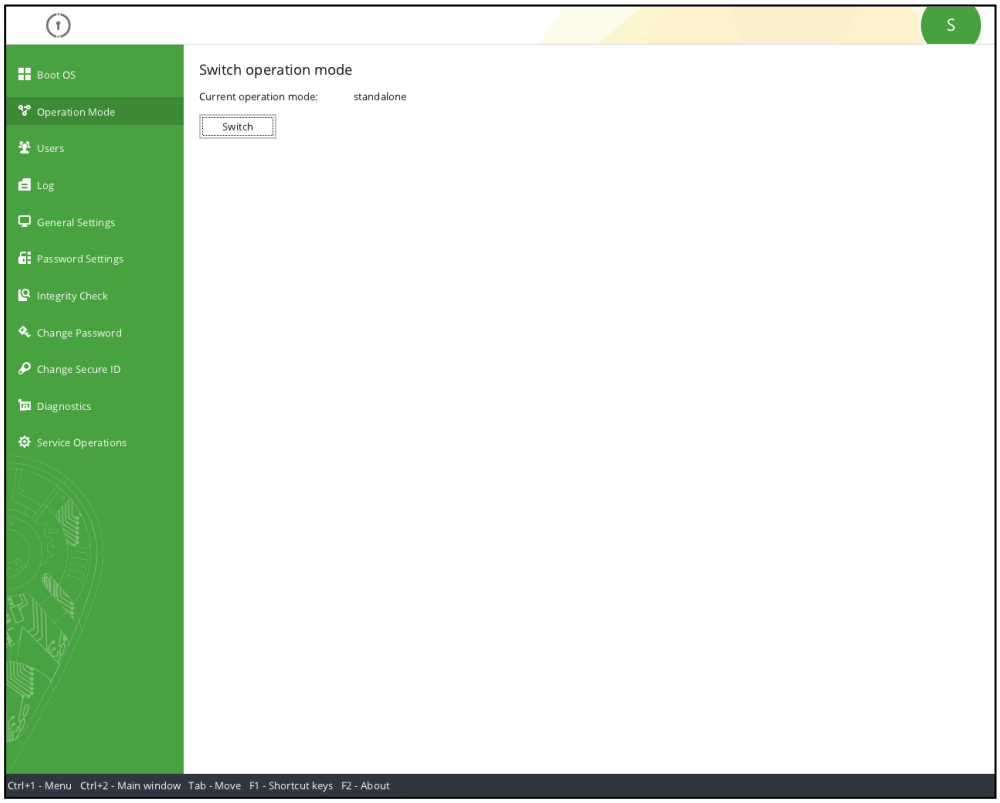
1. Set parameter values using Tab. 3 on p. **23** (except for the **System time and date** parameter).

   Note. You can change the system time in **Service operations** (see. p. **72**).

2. To save the changes, select **Save**.

Operation mode

In the administrator menu, after you select **Operation mode**, the window appears as in the figure below.



The **Current operation mode** parameter displays the Sobol operation mode which can be:

- **standalone** — Sobol is in standalone mode;
- **joint** — Sobol operates with other information security tools.

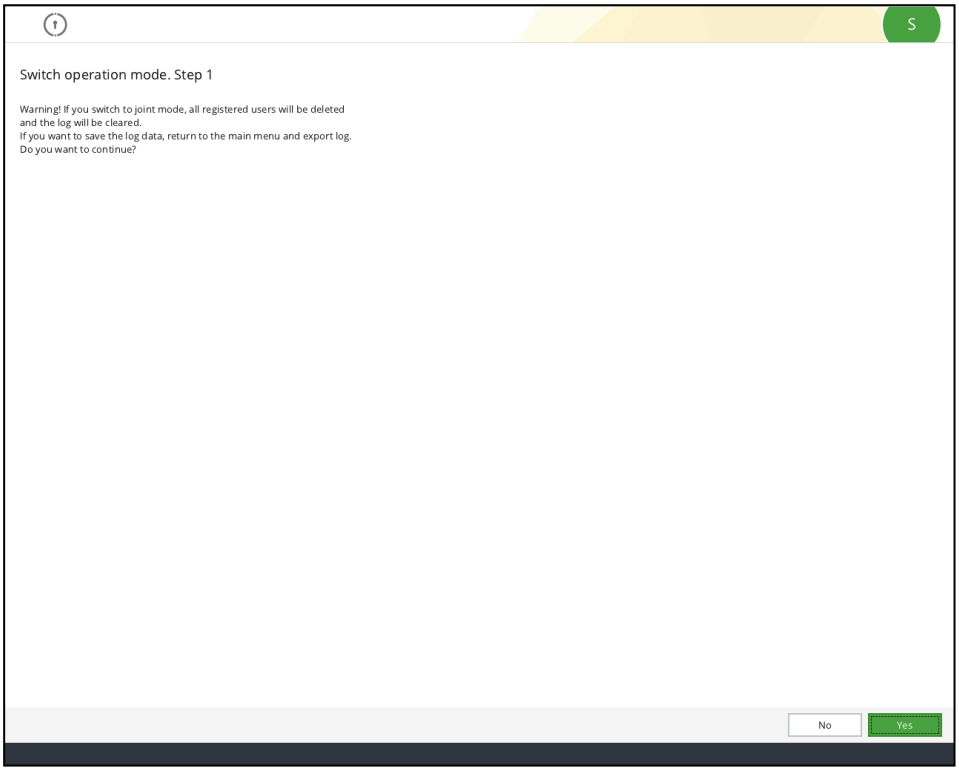
Note. For more information about the joint mode, see p. 97.

To switch the Sobol operation mode to joint:

Attention! When you switch the Sobol mode to joint:
- the user list and the log are cleared;
- the privileges of the Sobol administrator to manage the general settings, users and the log are restricted (see p. 97).

1. In the **Change operation mode** window, select **Change**.

   The following warning appears.



2. Choose your further action:
   - select **No** to go back to the administrator menu and to export the log;
   - select **Yes** to continue.

   The window requesting your security token appears.
3. Present your security token.

   Note. Select **Cancel** to cancel mode switching.

   Service information stored in the Sobol nonvolatile memory will be saved on the security token. After that, the success message appears.
4. Select **Next**.

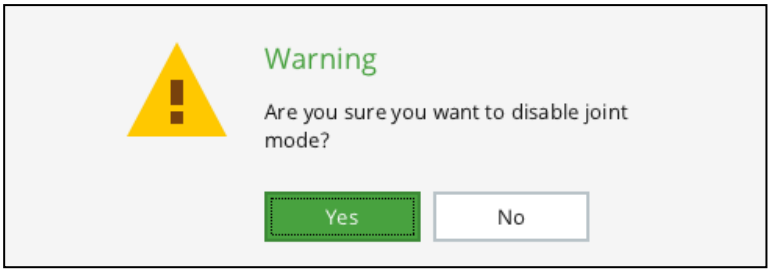
   The message about the successful switching to the joint mode appears.
5. Select **OK**.

   The user list and the log will be cleared. The **Current operation mode** parameter changes to **Joint mode**.

To switch Sobol operation mode to standalone:

Attention! When you switch the Sobol mode to standalone:
- the user list and the log are cleared;
- the Sobol administrator is granted full priveleges to manage the general settings, user accounts and the log.

1. In the **Change operation mode** window, select **Change**.
   The following dialog box appears.



2. Select **Yes**.

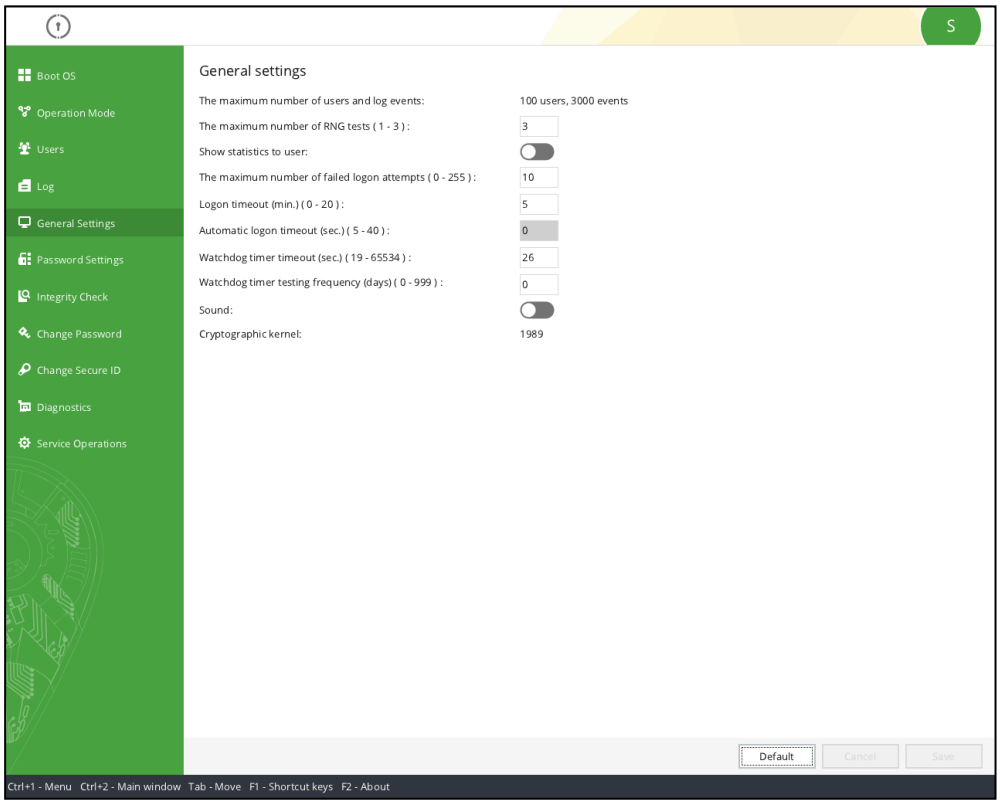
Note. Select **Cancel** to cancel mode switching.

The user list and the log will be cleared. The **Current operation mode** parameter changes to **Standalone mode**.

General settings

Attention! Some general settings are unavailable when Sobol is in joint mode (see p. **98**).

In the administrator menu, select **General settings**. The window appears as follows.



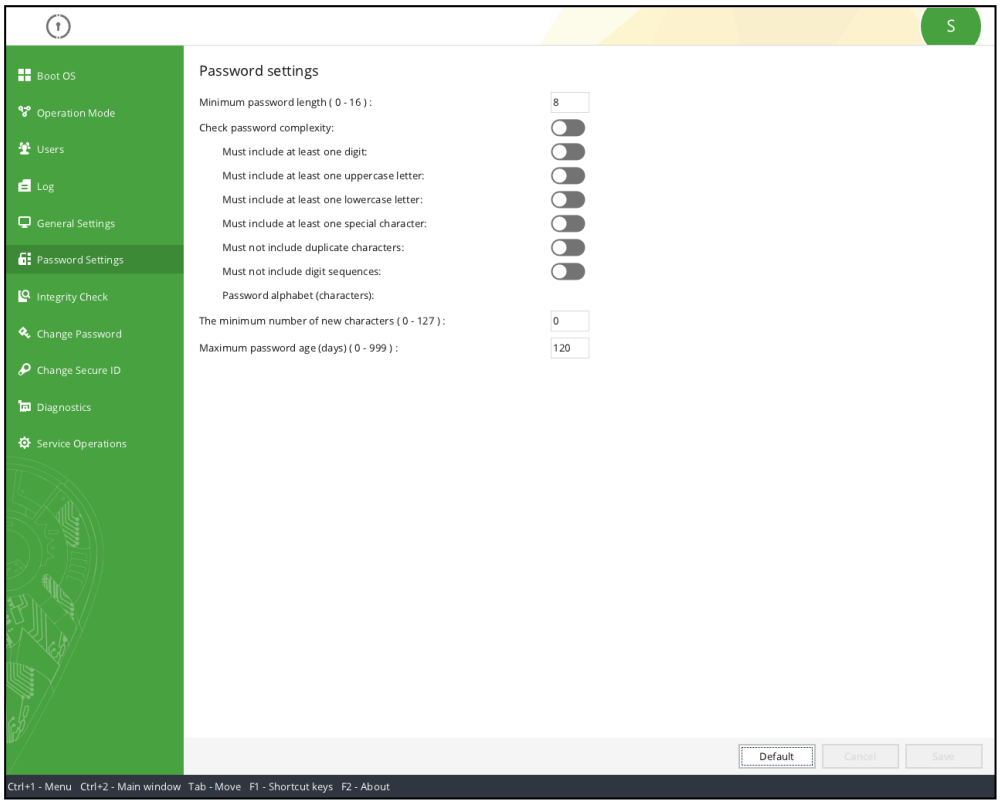
To configure parameters:

1. Set the values of Sobol general settings according to Tab. 4 on p. **25**.
2. Select **Save** to save the changes.
   To leave the previously set values, select **Cancel**.
   To reset the settings to the default values, select **Default**.

Password settings

Attention! Password settings are unavailable when Sobol is in joint mode (see p. 98).

In the administrator menu, select **Password settings**. The window appears as follows.



To configure parameters:

1. Configure Sobol password settings according to Tab. 6 on p. **28**.
2. Select **Save** to save the changes.

   To leave the previously set values, select **Cancel**.

   To reset the settings to the default values, select **Default**.

Users

Attention! User management is unavailable when Sobol is in joint mode. In this mode, you can only view the user lists and account parameters (see p. 98).

In the administrator menu, select **Users**. The window appears as follows.

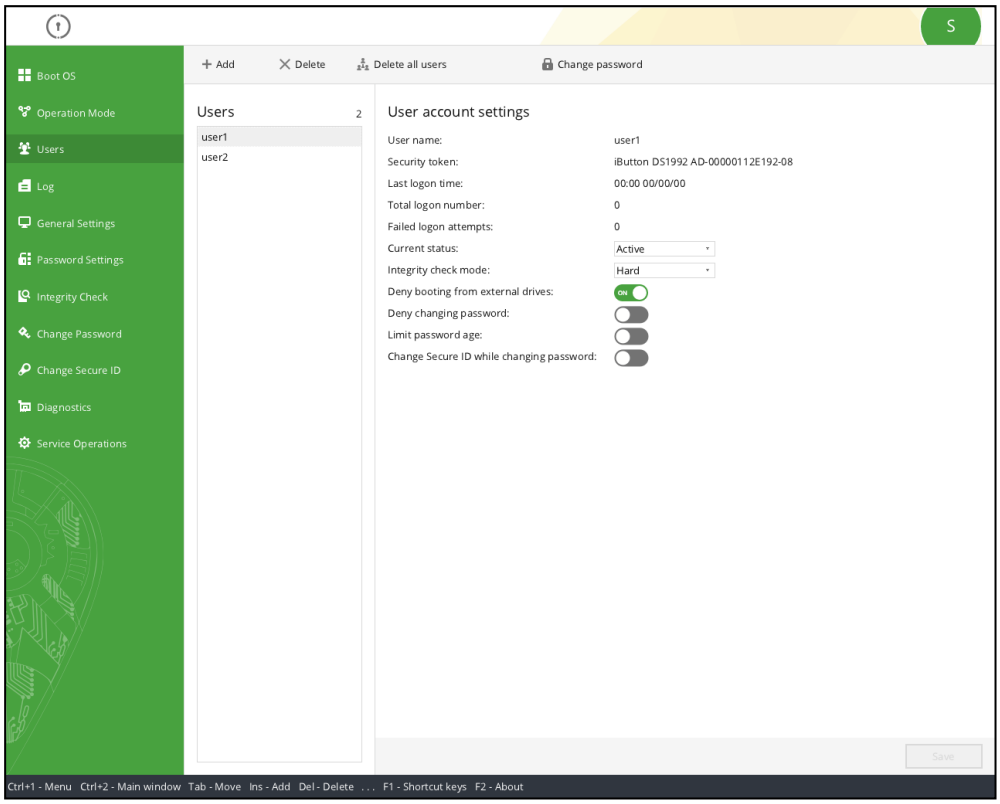


Fig. 14 The Users window

On the left of the display area, you can see the number and the list of users. The maximum account number is defined by the **The maximum number of users and log events** parameter (see Tab. 4 on p. **25**). You can set it during Sobol initialization. If no users are registered (after Sobol initialization, for example) the user list is empty.

On the right of the display area, you can see the parameters of a user account selected in the list. For more information about user account settings, see p. **54**.

On the top, you can see the user management panel with the following commands:

- **Add** (**<Ins>**) — register a new user (see below);
- **Delete** (**<Del>**) — delete a user account selected in the list (see p. **55**);
- **Delete all users** (**<Ctrl>**+**<Del>**) — delete all user accounts (see p. **56**);
- **Change password**(**<Ctrl>**+**<P>**) — change the password and the security token of a user selected in the list (see p. **56**).

Note. To see the full list of control keys, press <**F1**>.

User registration

When registering a new user, in the list of users, he or she is assigned the following attributes:

- the name;
- the Secure ID and the password;
- the security token.

Registered user accounts are saved in the Sobol nonvolatile memory.

The initial user registration procedure is described on p. **51**.

The user registration procedure is described on p. **53**.

During the initial user registration, service information is saved to the user's security token.

During the user registration, the service information stored on the security token after the initial registration is read without being modified. In this case, a user can log on to the system on different computers with Sobol using the same security token.

Attention! To repeat the user registration, select the cryptographic kernel similar to one that was selected during the initial registration (see p. **26**).

Note. When you register a user on a number of computers with Sobol, do the following: on the first computer: perform the initial registration of a user, then register the user on the rest of them. If you do so, the user can log on to the system on all the computers using a single security token.

Initial user registration

During the initial user registration, service information is saved to the user's security token.

Attention! If the security token already contains service information about the user registration on other computer with Sobol, it will be deleted, so that the user cannot use it to work on that computer.

To perform the initial user registration:

1. On the user management panel, (see Fig. 14 on p. **50**) select **Add** or press <**Insert**>.

   Note. If you receive a warning message about the exhaustion of the user list, delete one or more user accounts (see p. **55**) and repeat the registration.

   The window prompting you to enter a new user name appears.

2. Type the name of the new user and select **Next**.

   Note.
   - The maximum user name length is 40 Latin, Cyrillic and special characters including the space.
   - To change the keyboard layout, press <**F12**>.
   - If an entered user name already exists in the system, **A user with this name already exists** warning appears. Press any key and type another name.

   The dialog window appears as follows.

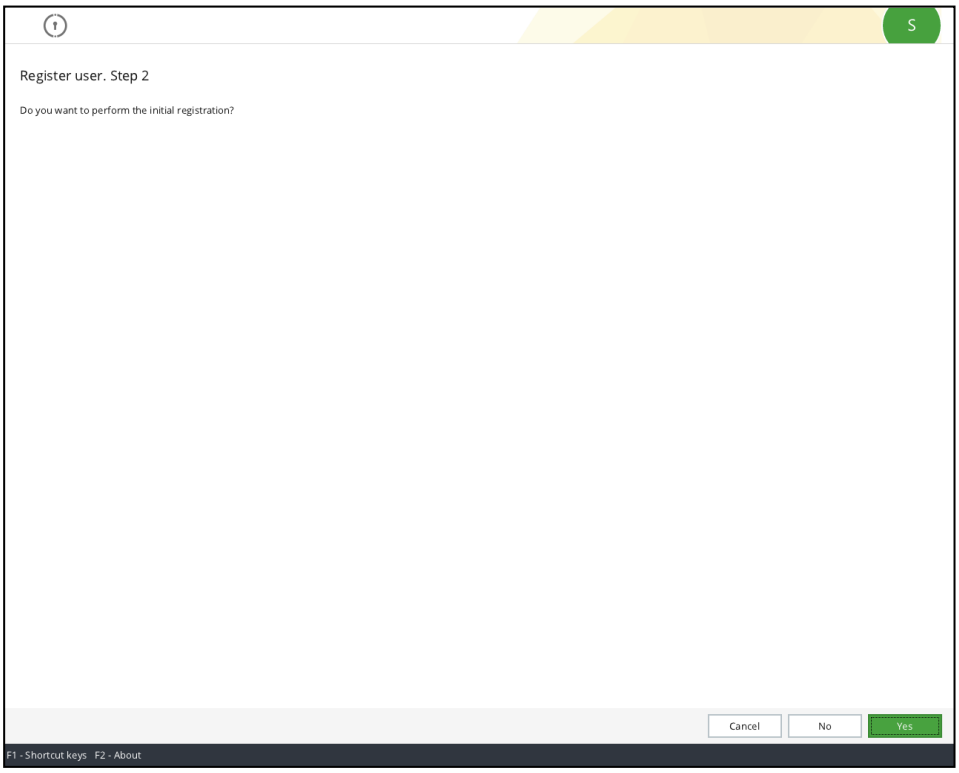


Fig. 15 A request dialog

3. Select **Yes**.

   The window prompting you to set a user password appears.

4. Type a password or generate a random one by selecting **Generate.**

   To view the password, press <**Alt**>+<**F8**> or set **ON** for **Show password**.

> **Note.**
> When you type a password, take the following into account:
> - if the password you entered is shorter than required, after you select **Next**, the **Minimum password length is ... characters** warning appears. Select **OK** and type a password once again considering the restriction;
> - a password can contain only the following:
>   - 1234567890 — digits;
>   - abcdefghijklmnopqrstuvwxyz — lowercase Latin characters;
>   - ABCDEFGHIJKLMNOPQRSTUVWXYZ — uppercase Latin characters;
>   - _$!@#;%^:&?*)(-+=/|.,<>`~"\ — special characters;
> - if the password complexity check is enabled, a password must correspond to the complexity rules defined by the Sobol password settings (see p. 49).
>
> When you generate a random password, take the following into account:
> - if the password complexity check is enabled, a generated password corresponds to the complexity rules defined by the Sobol password settings (see p. 49);
> - if the complexity check is disabled, the generated password contains digits, lowercase or uppercase Latin characters;
> - a generated password can be edited.

5. Type the entered password again in the **Confirm new password** text box.

> **Attention!** After the registration procedure is complete, provide a user with a password.

6. Select **Next**.

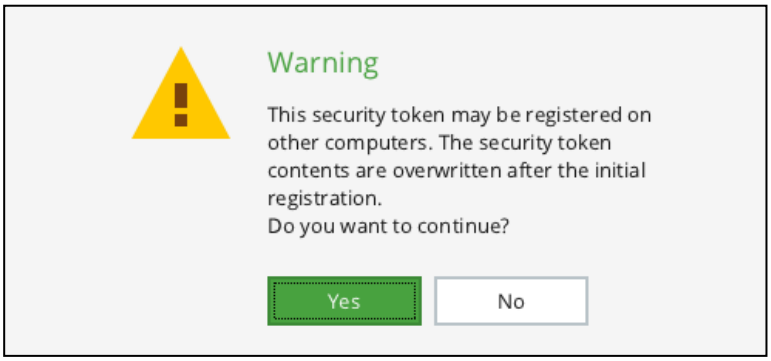
> **Note.** If a password entry error is detected, the respective message with the error description appears (see p. 92). Select **OK** and type the correct password.

After you type the password correctly, the window prompting you to present the security token appears.

7. Present the security token that is to be assigned to the user.

> **Note.**
> - If the security token is already presented (the iButton key touches the reader / the USB key is in the USB port / the smart card is in the USB smart card reader), Sobol reads it automatically.
> - If several security tokens are presented simultaneously, the one that Sobol finds first is read.
> - If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

- If the security token is presented incorrectly, the security token prompt dialog box appears.
- If the security token was registered previously on other computer and already contains service information, the following warning appears.



If you are sure that nobody uses this security token, select **Yes** and present it again.

> **Attention!** All service information stored on a security token will be deleted after the new information is saved to it. The user who owned the security token will not be able to use it to log on to the system.

If you want to use a different security token, select **No** and repeat step **7**.

- If the security token data structure is corrupted, the respective message appears. Sobol then suggests you format the security token.

> **Attention!** To fix data structure corruption of the security token, format it.
> After you format the iButton key, all data stored on it is deleted beyond recovery. After you format USB keys /smart cards, only information related to Sobol is lost.

To format the security token, select **Yes**. The security token is to be formatted and prepared for the further work.

To continue without formatting, select **No** and present another security token.

> **Note.** You can format the security token later by using **Format security token** command (see p. 71).

After you assigned a security token to a user and saved the user account to the Sobol nonvolatile memory, you receive the **User has been successfully registered** message.

8. Select **Finish**.

   The new user name appeares in the users list. Configure the account parameters of this user (see p. **54**).

User registration

The service information stored on the security token after the initial registration is only read when you register a user. In this case, a user can log on to the system on different computers with Sobol using the same security token.

> **Attention!** To register a user, his or her presence is required, because his or her private password is prompted.

To reregister a user:

1. Repeat steps **1–2** of the initial registration procedure.

   > **Note.** The name assigned to a user during the registration can differ from the one assigned during the initial registration on other computer.

2. In the appeared dialog, (see Fig. 15 on p. **52**) select **No**.

   The password is requested.

3. Ask the user to type his or her current password and then select **Next.**

   > **Attention!** The registered user password may be shorter than specified in **Minimum password length** (see Tab. 6 on p. **28**).In this case, before the first logon, a user must change the password. Otherwise, he or she cannot boot the operating system.

   The security token is requested.

4. Present the security token assigned to a user during the initial registration.

   > **Note.**
   > - If you have already presented the security token (the iButton key touches the reader / the USBkey is in the USB port / the smart card is in the USB smart card reader), Sobol reads it automatically.
   > - If several security tokens are presented simultaneously, the one that Sobol finds first is read.
   > - If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

   - If you presented the security token incorrectly, window prompting you to present the security token remains. Present the security token again.

- If the entered password does not match the presented security token (the password is wrong or the security token does not belong to the user), you receive the **Invalid password or security token** message.

  Select **OK** and repeat steps **2**–**4**.
- If an entered password matches a presented security token, service information is read and then saved to the Sobol nonvolatile memory.

After the information is saved, the success message appears. The name of the new user appears in the list.

5. Configure the registered user account settings (see below).

Set up user accounts

User account settings define the status of the account as well as allow you to choose the operation modes of the security mechanisms for each user.

To set up a user account:

1. In the user list, select the user account you are to configure (see Fig. 14 on p. **50**).
2. In **User account settings**, configure the required parameters using the table below.
3. Select **Save** to save the changes.

Tab. 7 User account settings

User name
Displays a name assigned to the user during registration. This parameter is for information purposes only and can not be edited
Security token
Displays type and the number of the user security token. This parameter is for information purposes only and can not be edited
Last logon time
Displays the time (HH:MM) and the date (DD/MM/YYYY)of the last user logon to the system. This parameter is for information purposes only and can not be edited
Total logon number
Displays the total number of user logons to the system since registration. This parameter is for information purposes only and can not be edited
Failed logon attempts
Displays the number of failed logon attempts. You can use this parameter to unlock a user account. The parameter takes the following values: • **0** if the number of failed logon attempts is less than the **Failed logon attempts limit** general parameter value (see Tab. 4 on p. **25**) and if a user ended a session by successfully logging on to the system; • greater than 0, if the number of failed logon attempts reached the **Failed logon attempts limit** general parameter value (see Tab. 4 on p. **25**). In this case, a user account is locked automatically. To unlock a user account, set **Failed logon attempts** to **0** and **Current status** to **Active**
Current status
Displays the account status which defines the user logon.The parameter takes on the following values: • **Blocked** — user logon is prohibited; • **Active** — user logon is allowed; If despite the user logon prohibition a logon was attempted, the **Logon is prohibited by administrator** warning appears and then the computer is locked
Integrity check mode

Defines an integrity check mode for a particular user. The parameter takes on the following values:
- **Hard** — if the integrity of monitored objects is violated, a user logon is prohibited, the computer is locked and the respective error is saved to the log;
- **Soft** — if the integrity of monitored objects is violated, a user logon is allowed, the computer is not locked, but the respective error is saved to the log

Deny booting from external drives

Use this parameter to deny booting from external drives (floppy disk, DVD/CD-ROM, ZIP devices, USB devices, etc) for users. The parameter takes on the following values:
- **ON** — booting from external devices is prohibited;
- **OFF** — booting from external devices is allowed

Deny changing password

Use this parameter to deny password changes for users. The parameter takes on the following values:
- **ON** — password change is prohibited;
- **OFF** — password change is allowed.

After you enable this parameter, **Change Secure ID while changing password** is unavailable.

Note. If password change is prohibited for a user with an expired password, do the following to change his or her password:
- log on to the system as an administrator, set **Deny changing password** for the user to **OFF** and then reboot the computer;
- let the user log on to the system and change the password;
- reboot the computer;
- log on to the system as an administrator, set **Deny changing password** for the user to **ON** and then reboot the computer.

Limit password age

Use this parameter to limit the password age for users. The parameter takes on the following values:
- **ON** — the password age is limited;
- **OFF** — the password age is unlimited.

After you enable this mode, the password validity is defined by the **Maximum password age** general parameter (see Tab. 6 on p. **28**). When the password becomes invalid, Sobol suggests to user that he or she should change the password before the logon.
If the **Change Secure ID while changing password** is enabled for the user, the Secure ID age is limited as well.
To enable the parameter, the respective user must be present. Ask him or her to enter the password and present the security token. If the password is correct, the parameter is set to **ON**

Change Secure ID while changing password

Use this parameter to enable changing a Secure ID alongside with changing a password. The parameter takes on the following values:
- **ON** — a Secure ID must be changed when changing a password;
- **OFF** — it is not necessary to change a Secure ID when changing a password

Delete a user account

To delete a user account:

1. In the users list (see Fig. 14 on p. **50**), select the required user;
2. On the users management panel, select **Delete** or press <**Delete**>.
   The respective dialog box appears.
3. Select **Yes**.

The selected user account is deleted from the Sobol nonvolatile memory. The user name will be deleted from the list.

Delete all user accounts

To delete all user accounts:

1. On the users management panel (see Fig. 14 on p. **50**), select **Delete all users** or press the key combination <**Ctrl**>+<**Delete**>.

   The respective dialog box appears.

2. Select **Yes**.

All user accounts are deleted from the Sobol nonvolatile memory. The users list will be empty.

Change user Secure ID and password

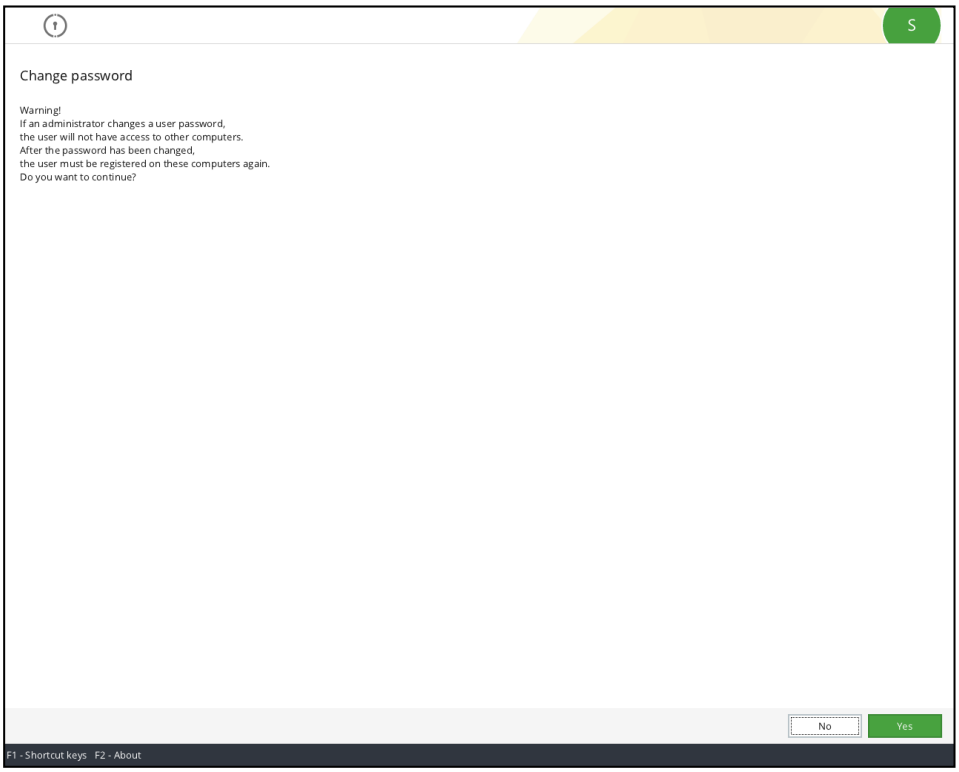
Before changing the Secure ID and the password of a user, take the following into account:

1. You can do this only if a password was compromised, that is for the **emergency** password change. Otherwise, a user changes his or her password. (see document [**3**]).
2. The Secure ID and the password of a user are changed correctly only if the user is registered with the security token on a single computer with Sobol.
3. If the user is registered on more than one computer using this security token, he or she will lose access to all computers except the one used to change the Secure ID and the password. In this case, register the user on other computers.

To change the Secure ID and the password of a user:

1. In the user list, (see Fig. 14 on p. **50**) select the required user.
2. At the top of the window, select **Change password** or press <**Ctrl**>+<**P**>.

   The window appears as follows.



3. If you are sure that you need to change the Secure ID and the password, select **Yes**.

   The dialog prompting you to enter a new password appears.

Note. The current user's password is not requested in this case.

4. In the respective text box, type the new user password or generate a random one by selecting **Generate** or pressing **<F8>**.

   To view the entered password, press <**Alt**>+<**F8**> or set **Show password** to **ON**.

   Note.
   When you type a password, take the following into account:
   - if the password you entered is shorter than required, after you select **Next**, the **Minimum password length is ... characters** warning appears. Select **OK** and type a password once again considering the restriction;
   - a password can contain only the following:
     - 1234567890 — digits;
     - abcdefghijklmnopqrstuvwxyz — lowercase Latin characters;
     - ABCDEFGHIJKLMNOPQRSTUVWXYZ — uppercase Latin characters;
     - _$!@#;%^:&?*)(-+=/|.,<>`~"\ — special characters;
   - if the password complexity check is enabled, a password must correspond to the complexity rules defined by the Sobol password settings (see p. 49).

   When you generate a random password, take the following into account:
   - if the password complexity check is enabled, a generated password corresponds to the complexity rules defined by the Sobol password settings (see p. 49);
   - if the complexity check is disabled, the generated password contains digits, lowercase or uppercase Latin characters;
   - a generated password can be edited.

5. Type the entered password again in the **Confirm new password** text box.
6. Select **Next**.

   Note. If a password entry error is detected, you receive the respective message with the error description (see p. 92). Select **OK** and type the correct password.

   After you type the password correctly, the window prompting you to present the security token appears.
7. Present the administrator security token.

   Note.
   - If the security token is already presented (the iButton key touches the reader / the USB key is in the USB port / the smart card is in the USB smart card reader), Sobol reads it automatically.
   - If several security tokens are presented simultaneously, the one that Sobol finds first is read.
   - If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

   - If the security token is presented incorrectly, the security token prompt dialog box appears.
   - If the presented security token does not belong to the user, you receive the **Invalid password or security token** message.

   When the security token is successfully read, you receive the **Password has been successfully changed** message.
8. Select **Finish**.

Configure automatic OS booting

Sobol provides automatic OS booting upon the security token presentation. It can be useful on platforms without data input devices (a keyboard, a mouse).

Note. An input device (a keyboard or a mouse) are required if integrity is violated.

To configure the automatic OS booting:

1. Set the general parameter value (see p. 48):
   - **Show statistics to a user** — **OFF**.
2. Set password parameters values (see p. 49):
   - **Minimum password length**— **0**;

- **Check password complexity** — **OFF**.

3. Configure the account parameters of a user who needs the automatic OS booting (see p. **54**):
   - set an empty password for this user;
   - **Deny changing password** — **ON**;
   - **Limit password age** — **OFF**.
4. Set the log parameter values (see p. **66**):
   - **Overwrite events** — **ON**;
   - **Time period for audit** — **0**.

Integrity check

Attention! In joint mode, the Sobol administrator can only select a volume or a folder with integrity check templates and calculate checksums. Other integrity check parameters are unavailable (see p. **99**).

After you select **Integrity check**, the window looks as follows.

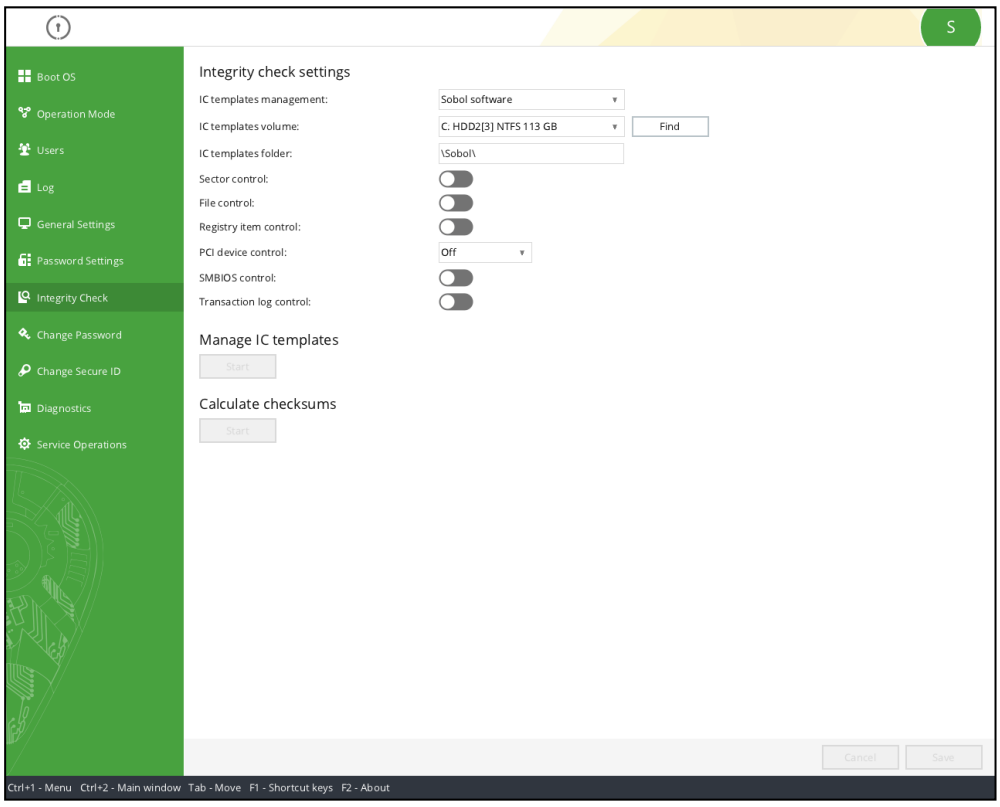


Fig. 16 IC parameters window

To set the up the integrity check mechanism and calculate checksums:

1. Set integrity check parameter values using the instruction on integrity check setup during Sobol initialization (see p. **33**, steps **1-5**).
2. Select **Save** to save the changes.

   To cancel the changes, select **Cancel**.
3. Calculate the integrity check objects checksums using the instruction on integrity check setup during Sobol initialization (see p. **33**, steps **6-7**).
4. If integrity check templates are managed with the Sobol software, you can configure integrity check templates. To do so, in **IC template management**, select **Run**.

   For instructions on how to work with Sobol IC template management software, see Chapter 4 (see p. **75**).

Change administrator Secure ID

Attention! You cannot change the Secure ID of the administrator while Sobol is in joint mode. For more information about Sobol configuration, see p. 97.

When changing the Secure ID of the administrator, the data on his or her security token is modified.

Attention! The maximum password age parameter is not set for an administrator. He or she must change the password and the Secure ID according to the organization security policy.

To change an administrator security token:

1. In the administrator menu, select **Change Secure ID**.
2. Select **Change**.

   The window prompting you to enter the administrator password appears.
3. Type the current administrator password and select **Next**.

   The windows prompting the security token appears.

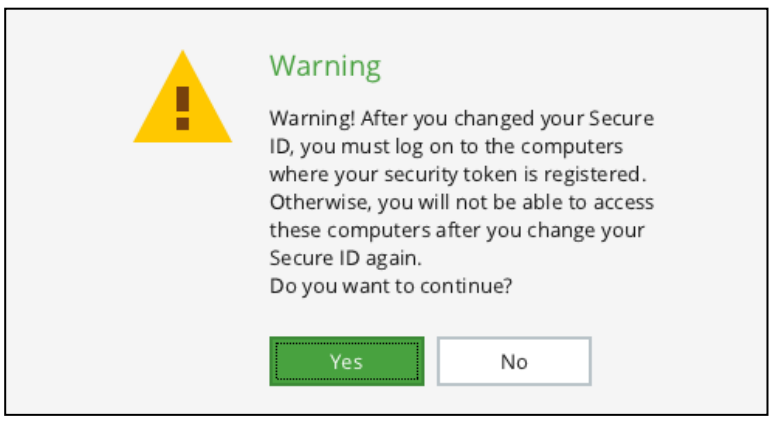
   Tip. You can refuse to change the Secure ID before presenting the security token. To do so, select **Cancel**.
4. Present the administrator security token.

   Note.
   - If the security token is already presented (the iButton key touches the reader / the USB key is in the USB port / the smart card is in the USB smart card reader), Sobol reads it automatically.
   - If several security tokens are presented simultaneously, the one that Sobol finds first is read.
   - If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

   If you presented your security token correctly, the old password you entered is compared to the data stored on the security token:

   - If your old password does not match the presented security token, you receive the **Invalid password or security token** message.

     Select **OK** and then present the administrator security token or Select **Cancel** and try to change your Secure ID again.
   - If the entered password matches the security token:
     - when you change your Secure ID for the first time, the new Secure ID is saved to your security token. The old Secure ID is saved there as well. After changing the Secure ID, an administrator still has access to other computers with Sobol , on which he or she is registered as an administrator;
     - when you change your Secure ID next time, the following warning appears.

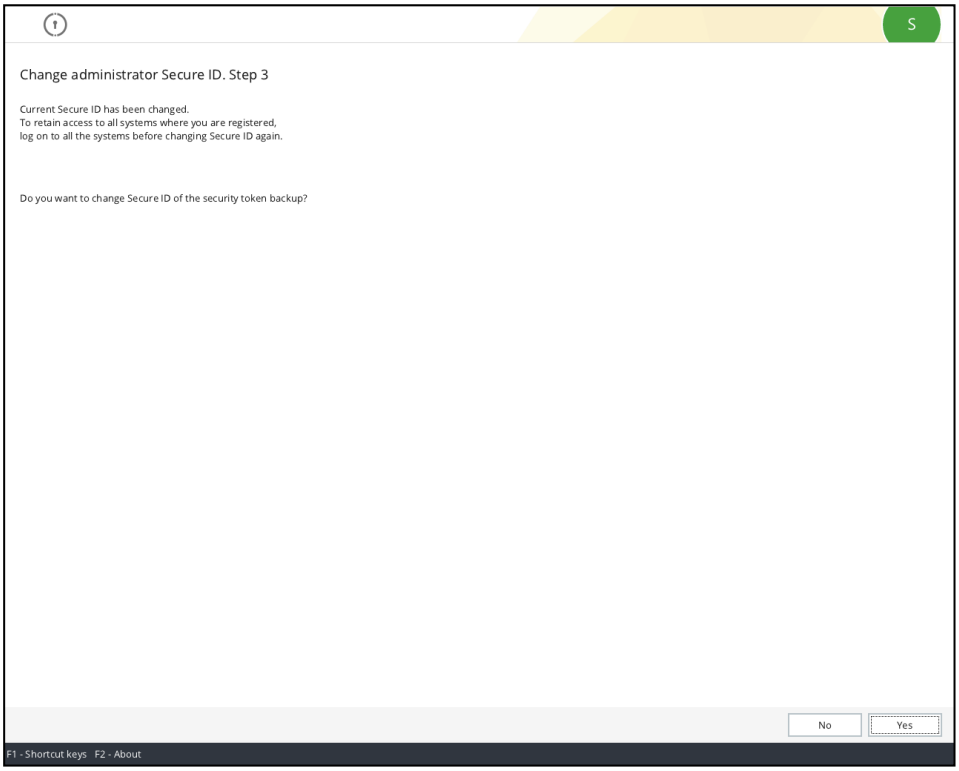


Note. An administrator security token stores a current Secure ID and a previous one. When you change your Secure ID, a new one is saved to the security token and a previous one is deleted from it. This way, you have access to other computers with Sobol, on which you are registered as an administrator. If you did not log on to any of these computers after having changed your Secure ID for the last time, you lose access to them, because the previous Secure ID used to access those computers is deleted from your security token. In this case, we recommend that you cancel the procedure of changing the Secure ID, log on to the required computers and then change your Secure ID.

To cancel the procedure of changing your Secure ID, select **No**.

To save the new Secure ID to your security token, select **Yes** and present the security token.

After the data saved to the security token, the window appears as in the figure below.



Attention! After you change your Secure ID, be sure to log on to all the computers with Sobol on which you are registered as an administrator. Unless you do so, you will lose access to those computers.

5. If no backups were created, select **No**. The procedure of changing the Secure ID is completed.

   If there are backups, select **Yes**. The window prompting your security token appears.

Tip. We recommend changing your Secure ID on all your security token backups created during Sobol initialization. This allows you to use them.

6. Present an administrator security token backup.

Note.

- If the security token is already presented (the iButton key touches the reader / the USB key is in the USB port / the smart card is in the USB smart card reader), Sobol reads it automatically.
- If several security tokens are presented simultaneously, the one that Sobol finds first is read.
- If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

- If you presented the security token incorrectly, the window prompting a security token remains. Present the security token again.

- If the presented security token is not a backup one, you receive the **Invalid password or security token** message.

  Select **OK** and present an administrator security token backup again.

If you presented the security token correctly, a new administrator Secure ID is saved to it. After, the window prompting you to save a new Secure ID to another security token backup.

7. Go to step **5**.

Change administrator password

Attention! You cannot change the password of the administrator while Sobol is in joint mode. For more information about Sobol configuration, see p. 97.

When changing the password of the administrator, the data on his or her security token is modified.

Attention! The maximum password age parameter is not set for an administrator. He or she must change the password and the Secure ID according to the organization security policy.

To change an administrator password:

1. In the administrator menu, select **Change Password**.
2. Select **Change**.

   The window prompting the current administrator password appears.

   Tip. You can refuse to change the password before presenting the security token. To do so, select **Cancel**.

3. Enter the current administrator password and select **Next**.

   The window prompting a new password appears.

4. In the respective text box, type the new administrator password or generate a random one by selecting **Generate** or pressing **<F8>**.

   To view the entered password, press <**Alt**>+<**F8**> or set **Show password** to **ON**.

   Note.

   When you type a password, take the following into account:
   - if the password you entered is shorter than required, after you select **Next**, the **Minimum password length is ... characters** warning appears. Select **OK** and type a password once again considering the restriction;
   - a password can contain only the following:
     - 1234567890 — digits;
     - abcdefghijklmnopqrstuvwxyz — lowercase Latin characters;
     - ABCDEFGHIJKLMNOPQRSTUVWXYZ — uppercase Latin characters;
     - _$!@#;%^:&?*)(-+=/|.,<>`~"\ — special characters;
   - if the password complexity check is enabled, a password must correspond to the complexity rules defined by the Sobol password settings (see p. 49).

   When you generate a random password, take the following into account:
   - if the password complexity check is enabled, a generated password corresponds to the complexity rules defined by the Sobol password settings (see p. 49);
   - if the complexity check is disabled, the generated password contains digits, lowercase or uppercase Latin characters;
   - a generated password can be edited.

5. Type the entered password again in the **Confirm new password** text box.
6. Select **Next**.

   Note. If a password entry error is detected, you receive the respective message with the error description (see p. 92). Select **OK** and type the correct password.

   After you type the password correctly, the window prompting you to present the security token appears.

Tip. You can refuse to change the password before presenting the security token. To do so, select **Cancel**.

7. Present the administrator security token.

Note.
- If the security token is already presented (the iButton key touches the reader / the USB key is in the USB port / the smart card is in the USB smart card reader), Sobol reads it automatically.
- If several security tokens are presented simultaneously, the one that Sobol finds first is read.
- If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

If you presented your security token correctly, the old password you entered is compared to the data stored on the security token:

- If your old password does not match the presented security token, you receive the **Invalid password or security token** message.

  Select **OK** and then present the administrator security token or select **Cancel** and try to change your password again.
- If your old password matches the presented security token, the respective service information is saved to the security token.

After the service information is saved, the **Do you want to set the new password for the administrator security token backup?** dialog box appears.

8. If no backups were created, select **No**. The procedure of changing the password is completed.

   If there are backups, select **Yes**. The window prompting your security token appears.

Tip. We recommend setting a new password for all administrator security token backups created during the Sobol initialization. By doing so, you can use the backups.

9. Present the backup administrator security token.

Note.
- If the security token is already presented (the iButton key touches the reader / the USB key is in the USB port / the smart card is in the USB smart card reader), Sobol reads it automatically.
- If several security tokens are presented simultaneously, the one that Sobol finds first is read.
- If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

- If you presented the security token incorrectly, the window prompting a security token remains. Present the security token again.
- If the presented security token is not a backup one, you receive the **Invalid password or security token** message.

  Select **OK** and present an administrator security token backup.

If you presented your security token correctly, the respective service information is saved to the security token. After, the dialog box for setting a new password for another administrator security token backup appears.

10. Go to step **8**.

Log

In the administrator menu, select **Log settings**. The window appears as follows.

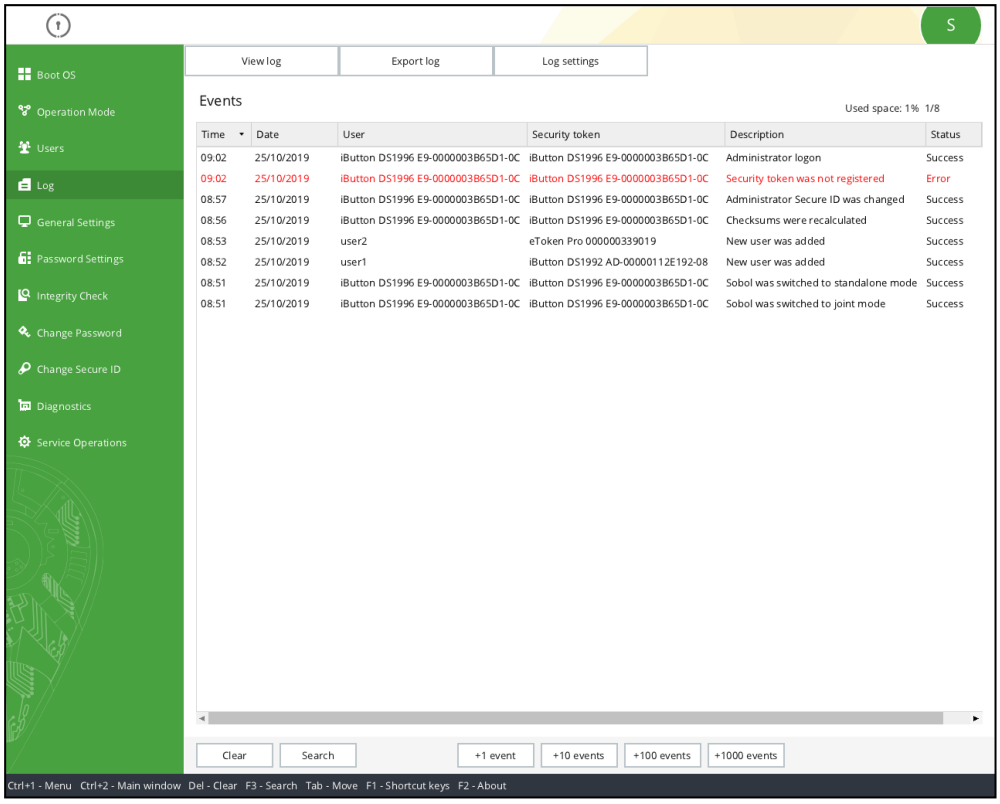


Fig. 17 The log settings

At the top of the **Log** window, there are the following tabs:

- **View log** — view the log (see below), search for records according to set parameters (see p. **64**), clear the log (see p. **65**);
- **Export log** — export the log into a file (see p. **65**);
- **Log settings** — configure the log (see p. **66**).

View the log

To view the log:

1. In the **Log** window, select the **View log** tab (see Fig. 17 on p. **63**).

   In the main window area, the log is displayed.

   Sobol event records are provided in a table and are highlighted in the following colors:

   - red — critical events;
   - black — information messages and events related to the actions of Sobol users and the administrator, implemented successfully.

   Every row of the events table contains data about a single event. Events are sorted in the order from the last registered event (at the top of the table) to the first one (at the bottom of the table).

   The table columns contain the following data:

Column name	Description
Time	The time of the event registration (HH:MM)
Date	The date of the event registration (DD/MM/YY)

Column name	Description
User	The name of a user whose actions resulted in the event registration The type of the presented security token of an administrator and users not registered in the system (including those deleted from the Sobol user list) is recorded
Security token	The security token ID of a user whose actions resulted in the event registration
Description	The description (type) of an event
Status	A result of the event. If the event was a success, it is assigned the **Success** status, otherwise - **Error**

2. Read the log content.

   To move lines up and down, press <↑> and <↓>, to page, press <**PgUp**> and <**PgDn**>, to scroll records, use the scroll bar.

   For the list of Sobol logged events, see p. **95**.

Search records

In the Sobol log, you can search for event records by their creation time and type. You can use both these parameters simultaneously.

To search for records by time:

1. In the **Log** window, select the **View log** tab (see Fig. 17 on p. **63**). Select **Search** or press <**F3**>.

   The following window appears.

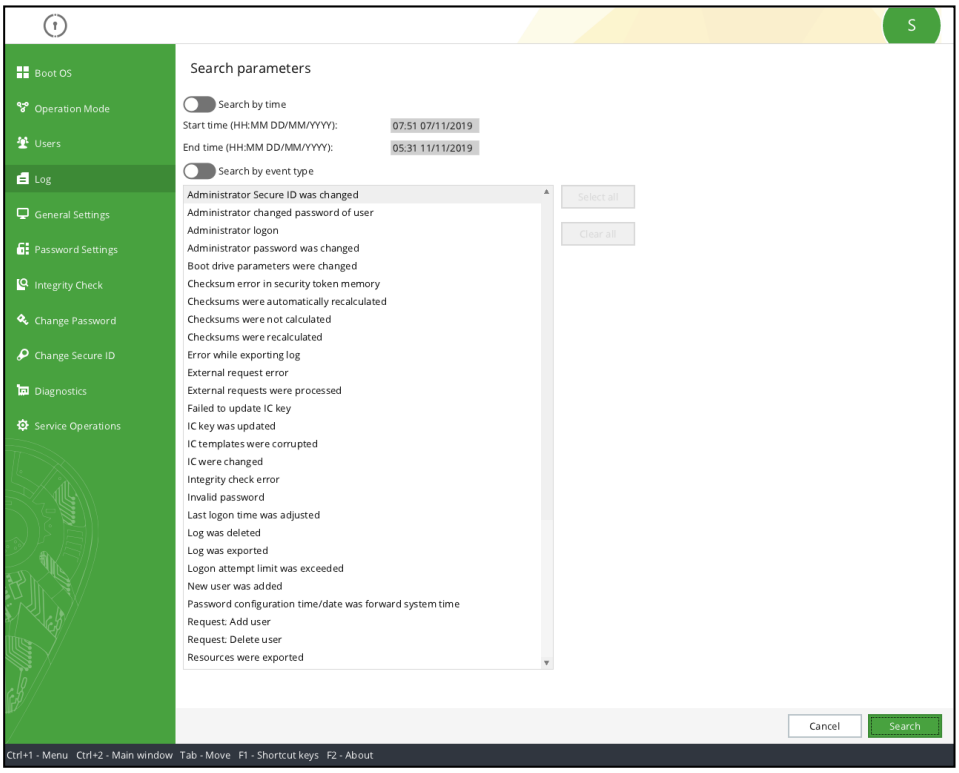


Fig. 18 The Search settings window

2. Turn on the **Search by time** toggle.

   The **Event start** and **Event end** parameters become available.

3. In the **Event start**, specify the lower limit of the event time interval in the following format: hours:minutes day/month/year.

4. In the **Event start**, specify the upper limit of the event time interval in the following format: hours:minutes day/month/year.

5. Select **Select events**.

   Records matching the search appear.

To search for records by type:

1. In the **Log** window, select the **View log** tab (see Fig. 17 on p. **63**). Select **Search** or press <**F3**>.

   The **Search settings** window appears (see Fig. 18 on p. **64**).
2. Turn on the **Search by type** toggle.
3. Select all required types and then select **Select events**.

   Note. To select all types, select **Select all**. To cancel the selection, select **Clear all**.

   Records matching the search appear.

Clear the log

Attention!
- Before you clear the log, read the content.
- You cannot clear the log when Sobol is in joint mode (see p. **99**).

To clear the log:

1. In the **Log** window, select the **View log** tab (see Fig. 17 on p. **63**). Select **Clear** or press <**Delete**>.

   The respective window appears.
2. Select **Yes**.

   All log records are deleted from the log. The following new record appears in the log — **Delete log**.

Export the log

You can export the Sobol log into a file created in advance. You can create a file to export the log in two ways:

- using the command line (see below);
- using Sobol software (see document [**2**]).

To create a file using the command line:

1. Run the command line in Windows OS or the terminal in Linux OS.
2. Go to the folder where you want to create the file.

   Note. The file is created in the Sobol default folder:
   - in Windows OS— in **\Sobol**;
   - in Linux OS — in **/sobol** or **/boot/sobol**.

   If the standard folder is not found, create it in the system drive.
3. Run the following command:
   - for Windows OS:

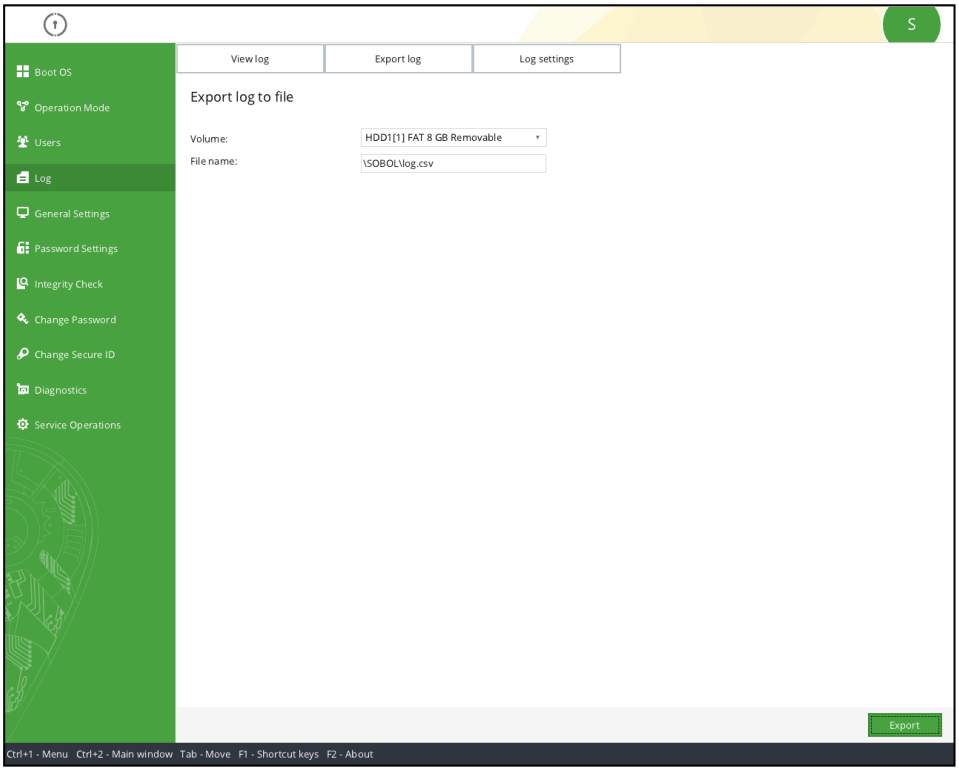
     ```
     fsutil file createNew log.csv 360000
     ```
   - for Linux OS:

     ```
     dd if=/dev/zero of=log.csv count=1 bs=360000
     ```

Note.
- Export the log into a file with the csv. extension. For example, **log.csv**.
- The file size is 360 times the number of records. The maximum number of records is defined by the **The maximum number of users and log events** parameter (see p. **25**). You can set the following values, when typing the command:
  - 1000 events — 360000;
  - 2000 events — 720000;
  - 3000 events — 1080000.
- In Linux OS, you can set file size differently:
  - 1000 events— 360K;
  - 2000 events— 720K;
  - 3000 events— 1080K.

To export the log into a file:

1. In the **Log** window, select the **Export log** tab (see Fig. 17 on p. **63**).
   The following window appears.



2. Specify the volume (disk, partition), the name of the file to export the log.
3. Select **Export**.
   After the log is exported, the respective success message appears.

Note. You can view the exported log via a text editor or a spreadsheet. Data columns are separated by tabs, data is enclosed in double quotes.

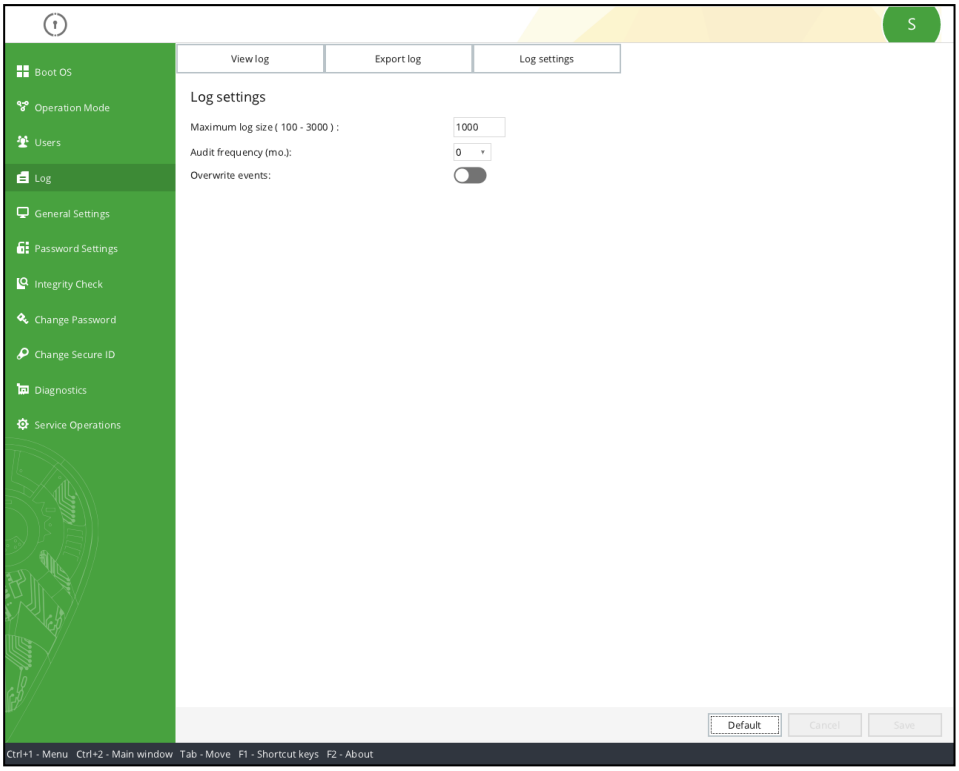
If any errors occur, the respective window appears (see p. **93**).

Configure log settings

Attention! Some log settings are unavailable when Sobol is in joint mode (see p. **99**).

To configure log settings during Sobol operation:

1. In the **Log** window, go to the **Log settings** tab (see Fig. 17 on p. **63**).
   The following window appears.



2. Configure the log settings using Tab. 5 on p. **27**.
3. Select **Save** to save the changes.
   To cancel, select **Cancel**.
   To set default values, select **Default**.

Diagnostics

To test Sobol operability, select **Diagnostics**:

- in the Sobol initilization menu (see Fig. 11 on p. **22**);
- in the administrator menu, when Sobol operates (see below).

The window appears as follows.

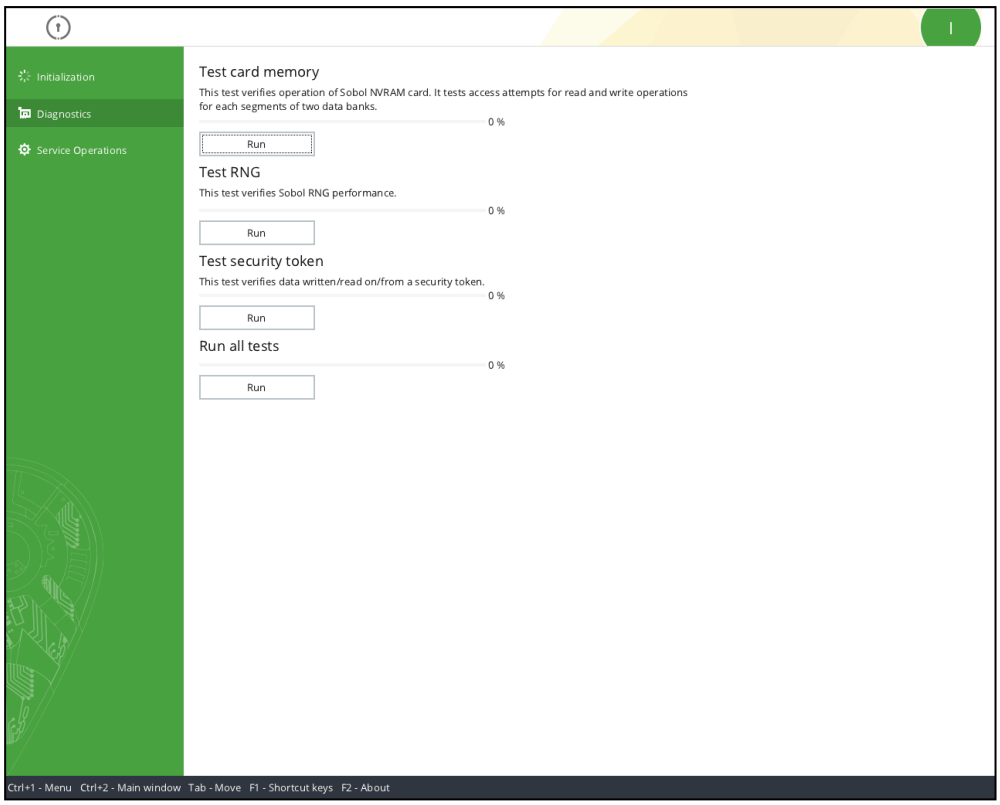


Fig. 19 The Test card memory window (operation mode)

Sobol provides the following operability tests:

- **Test card memory** — tests Sobol memory banks. During the test, read and write access to every segment of two memory banks is attempted.

  Attention! During the Sobol card memory test, do not reboot or shut down the computer. It can result in data loss from NVRAM.

- **Test RNG**— test the RNG processor operability.
- **Test security token** — checks for security token read/write faults.

  Attention! Present a security token for the test: the IButton key touches the reader / the USB key is in the USB port / the smart card is in the USB smart card reader.

- **Run all tests**— run all tests simultaneously.

  Note. After you run all tests, the window prompting a security token does not appear. Present a security token in advance.

To run Sobol tests:

1. Select a test and select **Run**.

   A test begins. The progress is indicated.

   To cancel the precedure, select **Cancel**.

   After a test is finished, the message with results appears.

2. Read the message referring to the error list if necessary (see p. **95**).

   Attention! If a card memory read errors occurs, the computer is locked for all users including the administrator. For more information about this error, see p. **91**.

Service operations

For **Service operations**, see:

- the Sobol initialization menu (see Fig. 11 on p. **22**);
- the administrator menu (see below).

After you select this menu item, the window appears as follows.

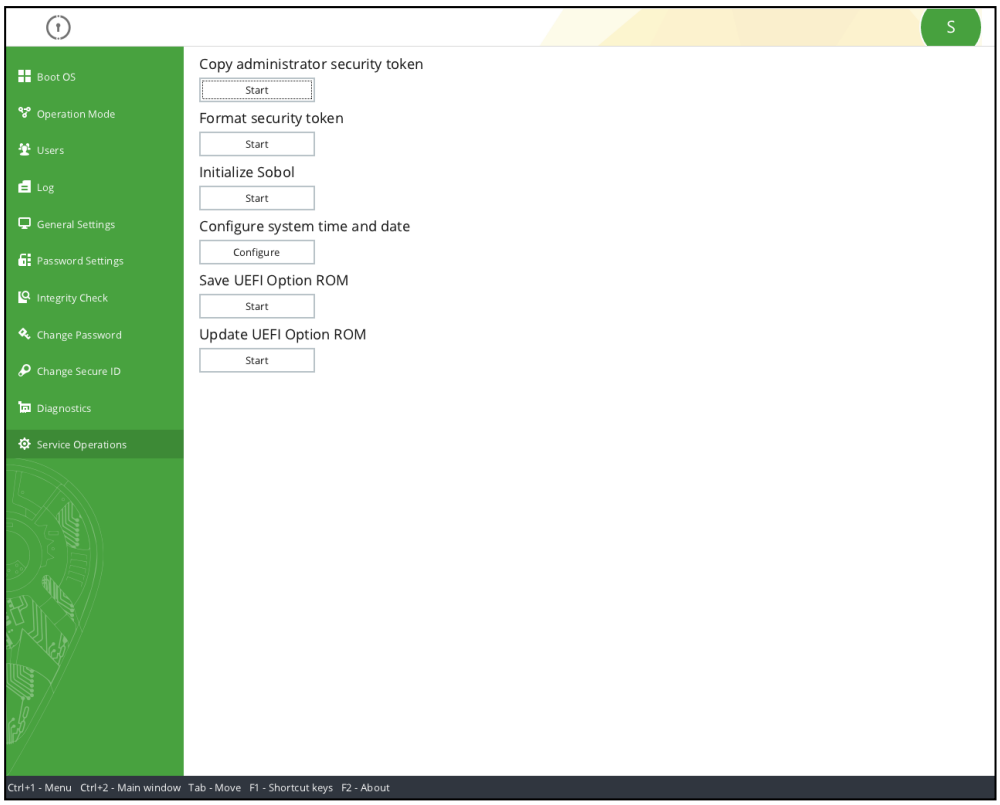


Fig. 20 The Service operations window (operation mode)

Sobol provides the following service operations:

- **Copy administrator security token** (see below);
- **Format security token** (see p. **71**);
- **Initialize Sobol** (see p. **71**);
- **Configure system time and date** (see p. **72**);
- **Save UEFI Option ROM** (see p. **72**);
- **Update UEFI Option ROM** (see p. **73**).

Note. The **Copy administrator security token** and the **Initialize Sobol** operations are available only when Sobol operates.

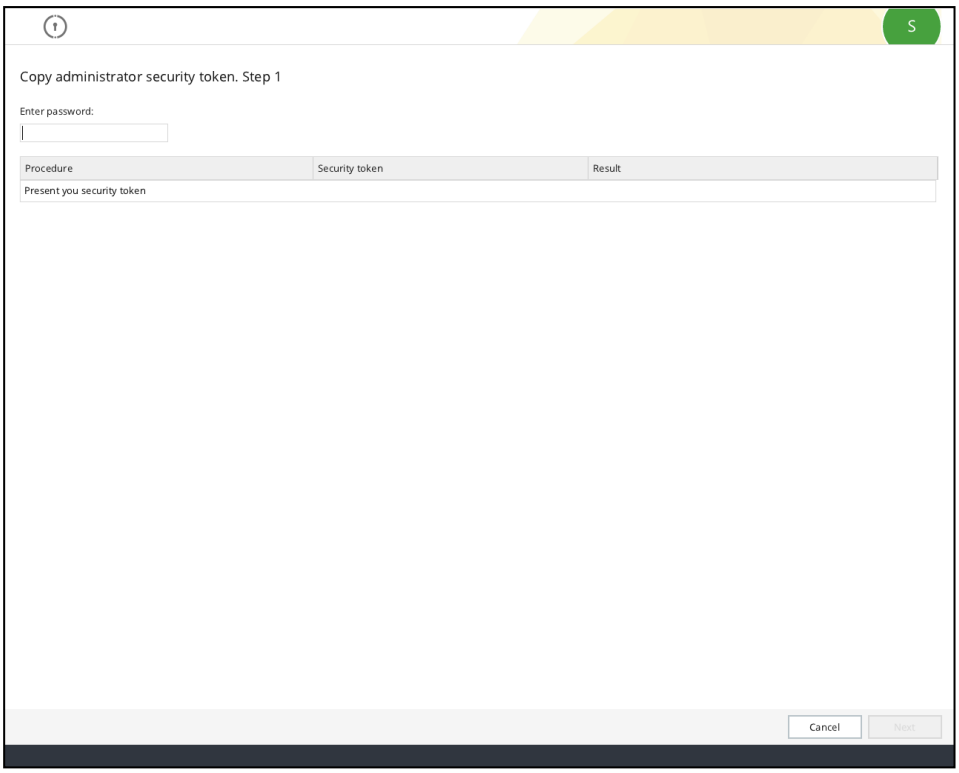
The **Update UEFI Option ROM** operation is available after you set the PCIe, M.2 cards SW-1 and the M.2, Mini PCIe Half S1 switches to ON. (see Fig. 2 on p. **14**, Fig. 5 on p. **18**, Fig. 10 on p. **21**).

Copy an administrator security token

To copy an administrator security token:

1. In the **Service operations** window (see the fig. above), in the **Copy administrator security token** area, select **Run**.

   The window appears as in the figure below.



2. In the **Enter password** text box, type the current administrator password.
3. Present the administrator security token.

Note.

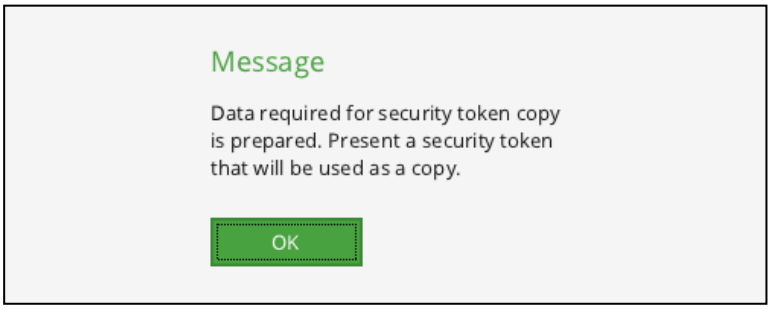
- If the security token is already presented (the iButton key touches the reader / the USB key is in the USB port / the smart card is in the USB smart card reader), Sobol reads it automatically.
- If several security tokens are presented simultaneously, the one that Sobol finds first is read.
- If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

4. Select **Next**.

   If a presented security token does not belong to the administrator or the password is incorrect, you receive the **Invalid password or security token** message.

   Present an administrator security token and type a correct password.

   If the user credentials are correct, you receive a message as in the figure below.



5. Select **OK**.

   The window prompting a security token appears.

6. Present the security token for a backup.

Note.
- If the security token is already presented (the iButton key touches the reader / the USB key is in the USB port / the smart card is in the USB smart card reader), Sobol reads it automatically.
- If several security tokens are presented simultaneously, the one that Sobol finds first is read.
- If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

The message indicating that the security token is ready for creating a backup appears.

7. Select **Copy**.

   When the security token is successfully copied, you receive the respective message.

8. Select **Finish**

Format a security token

Attention!
- Only security tokens that are **not registered** on a computer used for formatting can be formatted.
- After you format an IButton key, all data stored on it is lost beyond recovery. After you format a USB key, only data related to Sobol is lost.

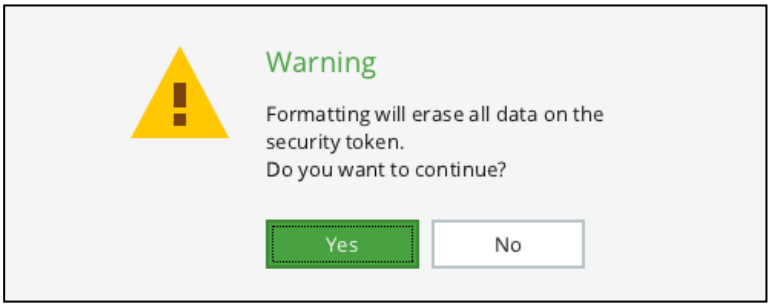
To format a security token:

1. Present a security token you need to format.

   Note. If several security tokens are presented simultaneously, the one that Sobol finds first is read.

2. In the **Service operations** window (see Fig. 20 on p. **69**), in the **Format security token** area, select **Run**.

   You receive a message as in the figure below.



3. If you are sure you want to format a security token, select **Yes**.

   Note. If you present a security token protected by PIN, the respective dialog box appears. Enter PIN and select **OK**. Default PIN is provided on p. 8.

   After the security token is formatted, you receive the respective message.

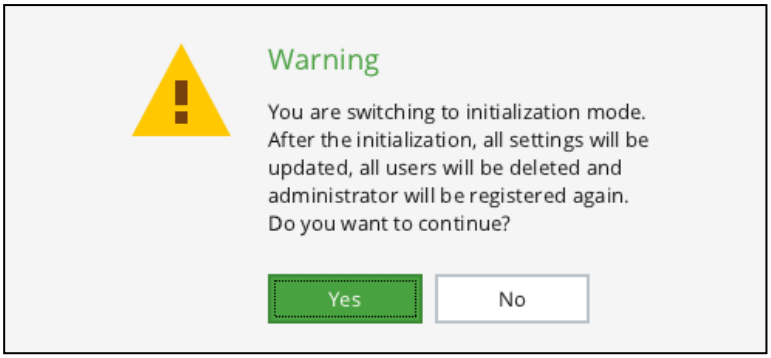
Initialize Sobol

Note. You can initialize during Sobol operation without switching the card for initialization.

To initialize Sobol:

1. In the **Service operations** window, (see Fig. 20 on p. **69**) select **Run.**

   The following warning appears.



2. To continue initialization, select **Yes**.
3. Perform the Sobol initialization procedure referring to p. **23**.

   After the initialization is finished, the respective message appears. The computer is to be rebooted.
4. Select **OK**.

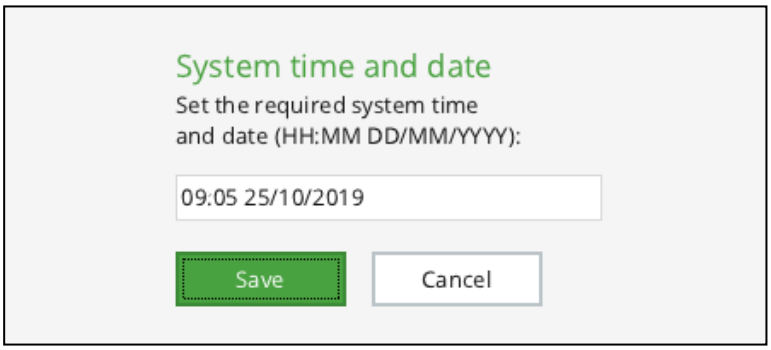
   The computer reboots.

Configure the system time and date

To configure the system time and date:

1. In the **Service operations** window (see Fig. 20 on p. **69**), in the **Configure system time and date** area, select **Set**.

   A dialog box appears as in the figure below.



2. Specify the correct values and select **Save**.

   Attention! Make sure the time/date you set do not fall behind the time/date when a user password was set. Otherwise, a user canot log on to the system.

   After you change the system time and date, you receive the respective message.

Save UEFI Option ROM

You can save the Sobol UEFI option ROM to a file created in advance. You can create file in two ways:

- using the command line (see below);
- using Sobol software (see document [**2**]).

To create a file using the command line:

1. Run the command line in Windows OS or in Linux OS.
2. Go to the folder where you want to create the file.

   Note. The file is created in the Sobol default folder:
   - in Windows OS— in **\Sobol**;
   - in Linux OS — in **/sobol** or **/boot/sobol**.

   If the standard folder is not found, create it in the system drive.

3. Run the following command:
   - for Windows OS:
     ```
     fsutil file createNew bios.bin 1072128
     ```
   - for Linux OS:
     ```
     dd if=/dev/zero of=bios.bin count=1 bs=1072128
     ```

Note. You can enter any name for the file.

To save the UEFI option ROM to a file:

1. In the **Service operations** window (see Fig. 20 on p. **69**), in the **Save UEFI Option ROM** area, select **Run**.

   A dialog box appears as in the figure below.

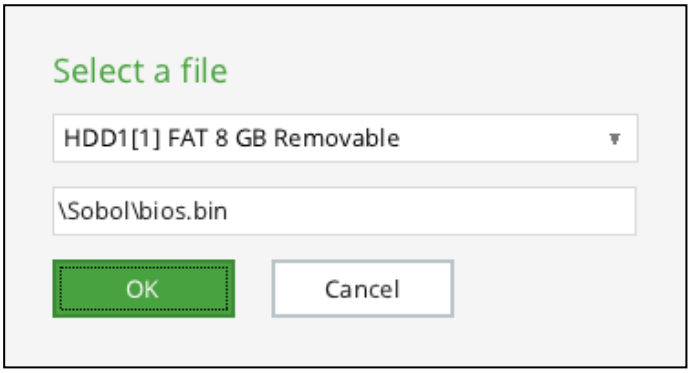


Fig. 21 The window for selecting a file

2. Change the volume and/or a file name if necessary.
3. Select **OK**.

Note. If the path to a file is incorrect, the error message appears. Select **OK** and try again.
Make sure you use short forms for long names (more than 8 characters) of files stored on disks with FAT16 and FAT32. For example, pci-m~1.bin. For a file name short form, use the DIR command or a file manager such as Total Commander.

After you save the UEFI Option ROM, you receive the respective message.

Update UEFI Option ROM

Attention!
- All Sobol settings are reset after you update the UEFI option ROM.
- Before updating, set the switch SW1-2 of the PCIe / M.2 cards, the switch S1-2 of the Mini PCIe Half card to ON (see Fig. 2 on p. **14**, Fig. 5 on p. **18**, Fig. 10 on p. **21**).

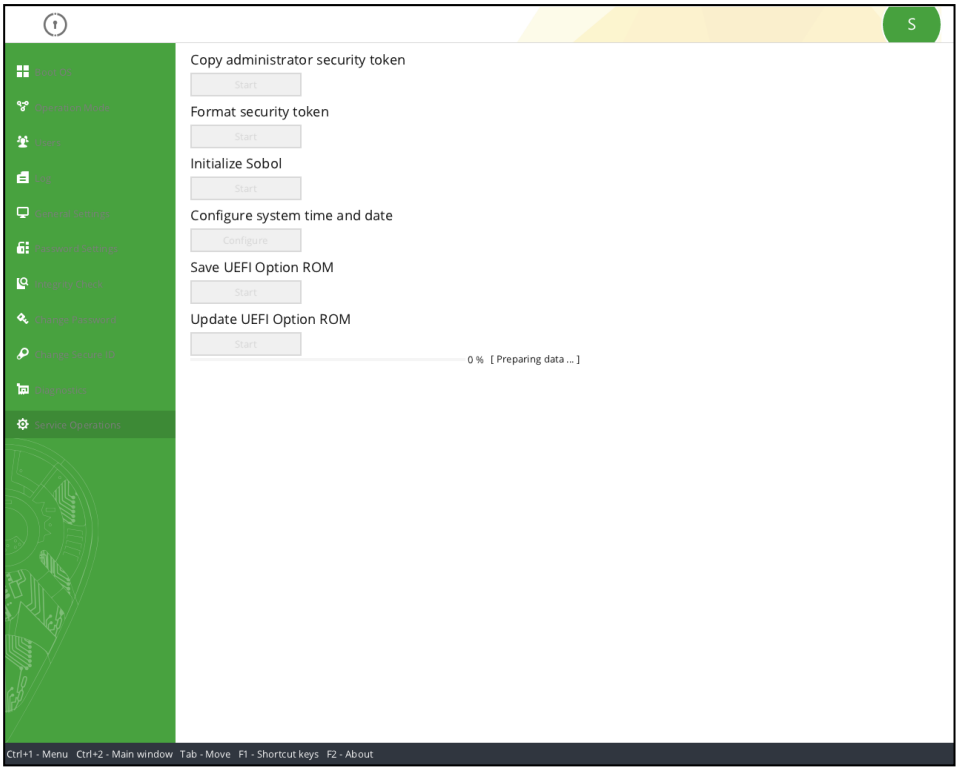
To update the UEFI option ROM:

1. In the **Service operations** window (see Fig. 20 on p. **69**), in the **Update UEFI Option ROM** area, select **Run**.

   The window for selecting an UEFI Option ROM file appears (see Fig. 21 on p. **73**).
2. Change the volume (disk, partition) and/or a file name if necessary.
3. Select **OK**.

Note. If the path to a file is incorrect, the error message appears. Select **OK** and try again.
Make sure you use short forms for long names (more than 8 characters) of files stored on disks with FAT16 and FAT32. For example, pci-m~1.bin. For a file name short form, use the DIR command or a file manager such as Total Commander.

The UEFI option ROM updating begins.



After the procedure is finished, you receive the respective message.

4. Select **OK**.

   The computer will be shut down. When you start it next time, the new UEFI option ROM will be used.

Complete Sobol configuration

To complete Sobol configuration do one of the following:

- shut down the computer if you do not need to continue working;
- in the administrator menu, select **Boot OS** if you need to continue working on the computer (see Fig. 11 on p. **22**).

  If the integrity check is on, before the OS boots, the set objects are checked. Select **Finish** after the check is completed.

Note.

- To abort the check, press <**Esc**> or select **Stop**.
- If an error occurred, the integrity check is stopped. Read an error message (for a list of errors, see p. **93**). To resume the check, select **OK**.
- If you do not need Sobol notifications during checksums calculation, select **Don't ask again** in the error message window.
- After the check is finished and the OS boots, address error causes. Calculate integrity check objects checksums (see p. **58**).

The OS booting begins.

Chapter 4
IC template management

Sobol allows you to add/remove objects to/from IC templates to enable/disable integrity check for these objects.

IC template is a service file that contains information about objects being checked for integrity when the IC mechanism is enabled.

IC template contains the following:

- resources — the object identification data;
- checksums.

To manage IC templates:

- in standalone mode — use either built-in IC template management or Sobol software;

  Note. You can select the way to manage IC templates in the Sobol administrator menu, the **Integrity Check** section (see p. 58).

- in joint mode — use the tools of a product that operates in tandem with Sobol.

This chapter provides guidelines on using built-in IC template management.

Note. For detailed information about the purpose, setup and operation of the Sobol software, see document [2].

Purpose of built-in IC template management

Built-in template management allows you to configure IC templates using the administrator menu. You can perform the following procedures:

- create resource groups (see p. **77**);
- add resources to a group (see p. **78**);
- rename groups, move resources between groups (see p. **85**);
- sort resources (see p. **85**);
- export and import resources (see p. **86**);
- delete groups and resources (see p. **89**).

Built-in IC template management operates with a template created by the administrator (see p. **75**).

On computers running Windows, built-in IC template management allows you to check integrity of the following objects:

- files;
- hard drive sectors;
- registry items;
- PCI devices;
- SMBIOS tables.

On computers running Linux, built-in IC template management allows you to check file and hard drive sector integrity. On computers running CentOS 7.3, you can also check PCI device and SMBIOS tables integrity.

Create an IC template

You can create an IC template manually using the command line.

To create an IC template:

1. In Windows, run the command prompt; in Linux, run the command line terminal.
2. Go to the Sobol folder:

- in Windows — the **\Sobol** folder;
- in Linux — the **/sobol** or **/boot/sobol** directories.

Note. If standard folders are not found, create them in a system volume.

3. To create an IC template and its backup, run the following command:
   - in Windows:

```
fsutil file createNew icheck.json 34000000
fsutil file createNew icheck_backup.json 34000000
```

   - in Linux:

```
dd if=/dev/zero of=icheck.json count=1 bs=32M
dd if=/dev/zero of=icheck_backup.json count=1 bs=32M
```

An IC template file (**icheck.json**) and its backup files (**icheck_backup.json**) are created in the standard Sobol folder. When you edit an IC template using built-in IC template management, all changes are saved in the template and backup files.

Start built-in IC template management

To start built-in IC template management:

1. In the administrator menu (see Fig. 13 on p. **45**), select **Integrity Check**.
2. In the appeared window (see Fig. 16 on p. **58**), in the **IC template management** section, select **Start**.

   A window appears as in the figure below.

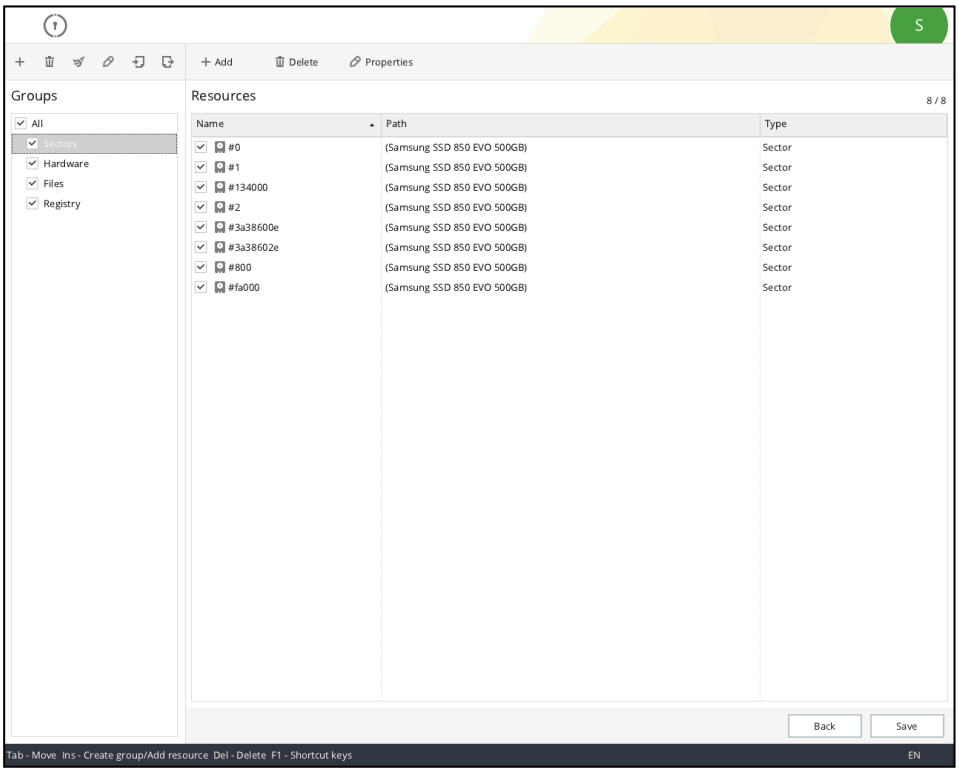


Fig. 22 The main window of built-in IC template management

The **Groups** section contains a list of resource groups and buttons to manage them.

The **Resources** section contains a list of resources included in a selected group and buttons to manage them.

Creating a resource group

To create a resource group:

1. In the **Groups** section (see Fig. 22 on p. **76**), select  .
   A window appears as in the figure below.

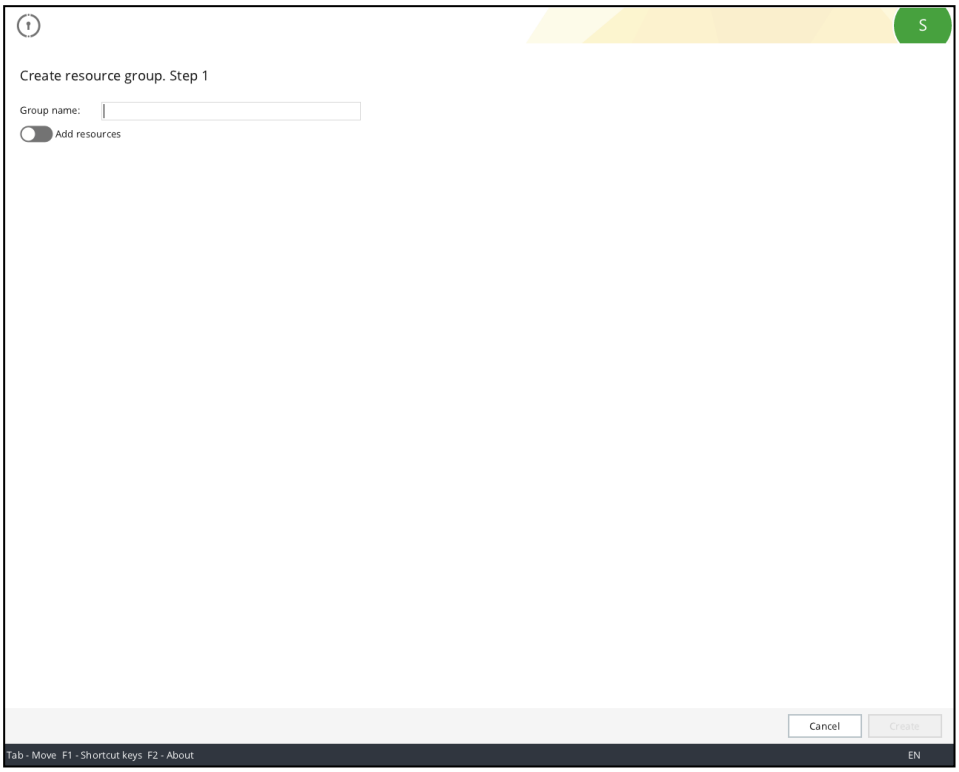
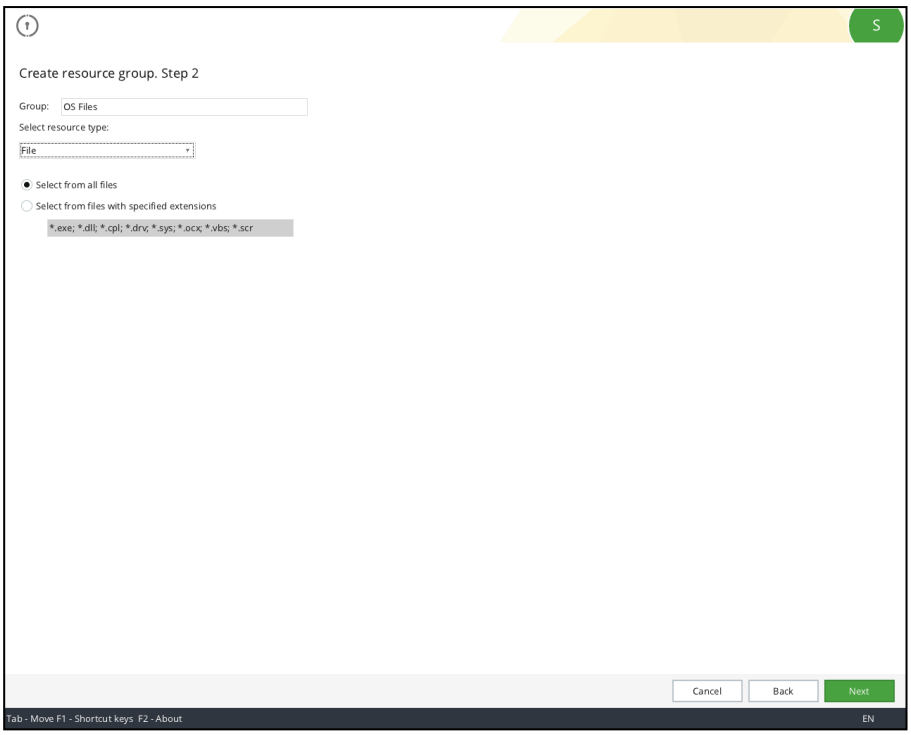


Fig. 23 The Create resource group. Step 1 window

2. Enter a name for a resource group.

Note. To switch keyboard layout, press **<F12>**.

3. Then:
   - To create an empty group, select **Create**.
     A new group appears in the **Groups** section.
   - To create a group and to add resources to this group, turn on the **Add resources** toggle and select **Create**.
     A window appears as in the figure below.



4. For detailed information about adding resources to a group, see:
   - p. **79** for files;
   - p. **80** for registry items;
   - p. **81** for registry keys;
   - p. **82** for hard drive sectors;
   - p. **83** for device configuration.

Add resources to a group

To add resources to a group:

1. In the **Groups** section (see Fig. 22 on p. **76**), select the required group.
2. In the **Resources** section, select **Add**.
   A window appears as in the figure below.

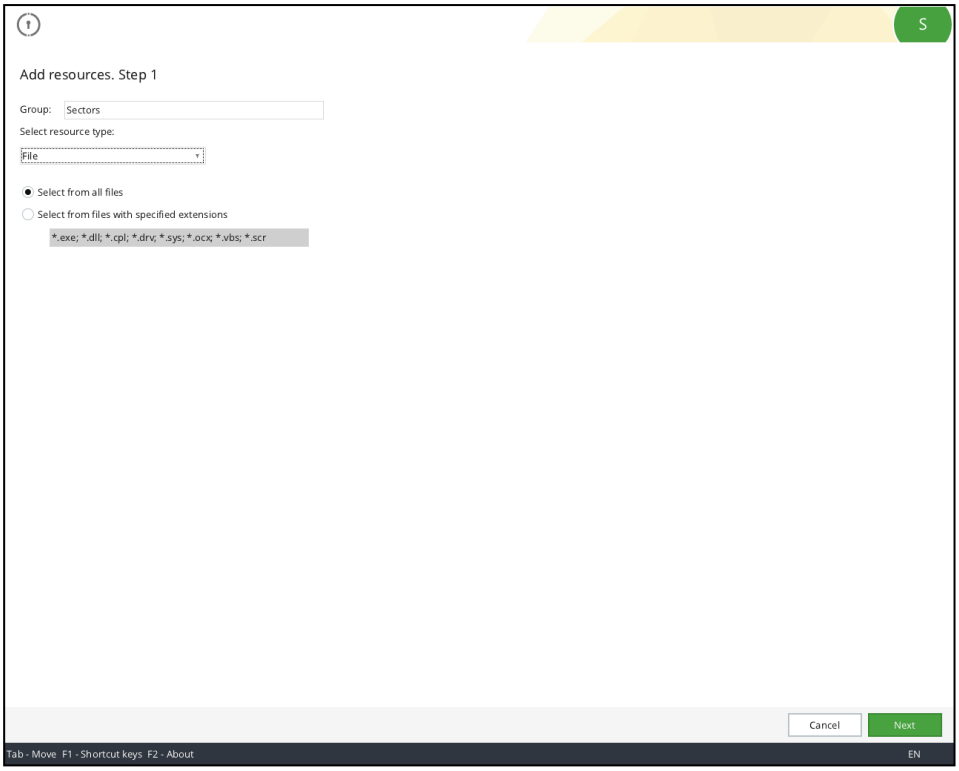


Fig. 24 The Add resources. Step 1 window

Note. When you add resources while creating a group (see p. 77), the window heading differs from one in the figure above.

3. Proceed to procedures for adding the required type of resources:
   - see below for files;
   - p. **80** for registry items;
   - p. **81** for registry keys;
   - p. **82** for hard drive sectors;
   - p. **83** for device configuration.

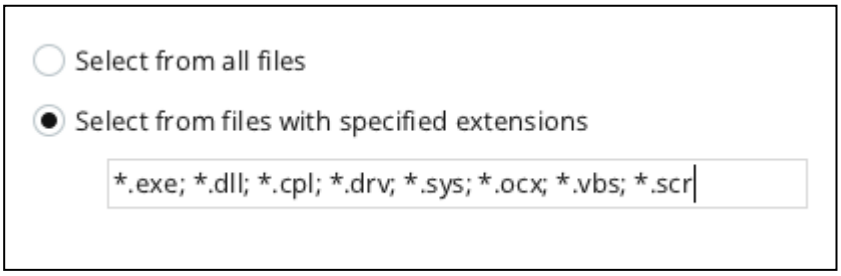
Add files to a group

To add files to a group:

1. In the **Add resources. Step 1** window (see the figure above), in the drop-down list, select the required file type.

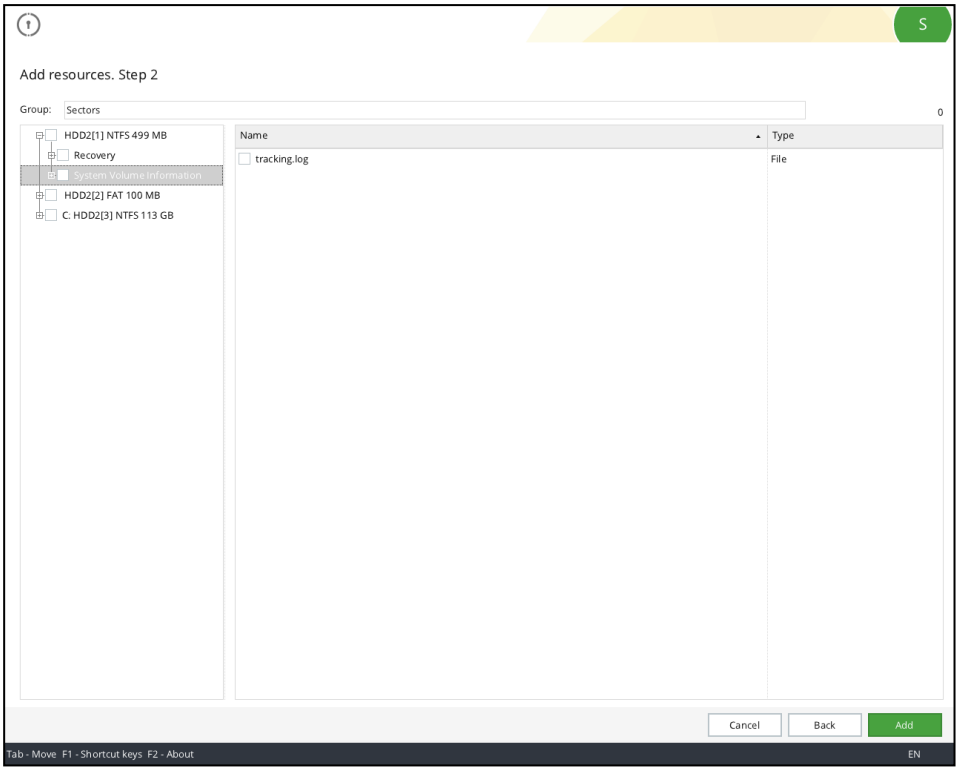
   Now you can select the required way to add files.
2. Select the way to add files:
   - **Select from all files** — to select files manually;
   - **Select from files with specified extensions** — to add files filtered by extensions specified in the text box below.

     If you selected this option, specify the required file extensions.



3. Select **Next**.

A window where you can select the required resources appears. The folder structure is shown on the left; files included in the selected folder are shown on the right.



4. Select the required files and folders.

Note. Selecting files and folders note that:

- To select a file, select ☑.
- The selected folder may be indicated as follows:
  - ■ — the folder contents are selected partly/subfolders are not opened and the files are not selected;
  - ☑ — all the files and subfolders are selected.
- To select a folder that contains subfolders, open all the subfolders.
- If you previously selected **Select from files with specified extensions**, you can only view the folder structure, files of the selected folder are not shown. When you add the folder to the IC template, all files with the specified extensions are selected.

5. Select **Add**.

Note.

- If you add resources while creating a group, select **Create**.
- To return to the previous step, select **Back**.
- To cancel adding resources, select **Cancel**.

The selected resources are added to the group. The main window of Built-in IC template management appears.

6. To save changes, select **Save**.

Note. To return to the administrator menu, select **Back**.

Add registry variables to a group

Note. This feature is available only in Windows.

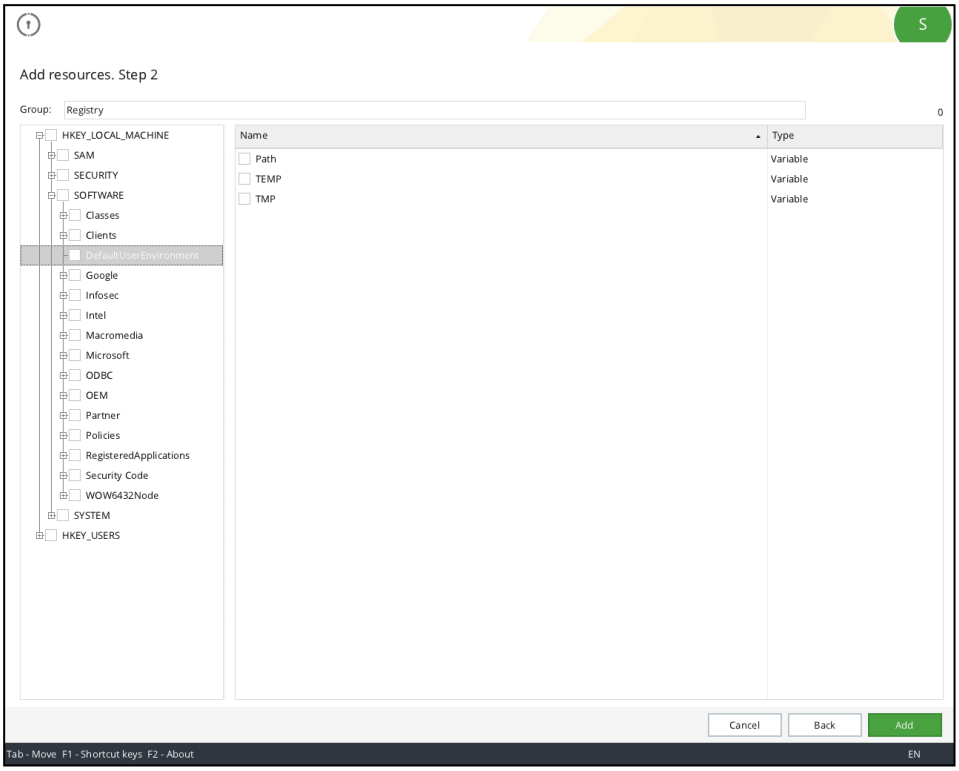
To add registry variables to a group:

1. In the **Add resources. Step 1** window (see the figure above), in the drop-down list, select **Registry variable**.

The **OS volume** drop-down list appears.

2. In the **OS volume** drop-down list, select the required volume.
3. Select **Next**.

   A window where you can select the required resources appears. The registry structure is shown on the left; the variables of the selected section/subsection are shown on the right.



4. Select the required resources.

Note. Selecting registry variables note that:

- To select a variable, select  .
- The selected section may be indicated as follows:
  -  — the section contents are selected partly/subsections are not opened and the variables are not selected;
  -  — all the variables and subsections are selected.
- To select a section that contains subsections, open all the subsections.

5. Select **Add**.

Note.

- If you add resources while creating a group, select **Create**.
- To return to the previous step, select **Back**.
- To cancel adding resources, select **Cancel**.

The selected resources are added to the group. The main window of Built-in IC template management appears.

6. To save changes, select **Save**.

Note. To return to the administrator menu, select **Back**.

Add registry keys to a group

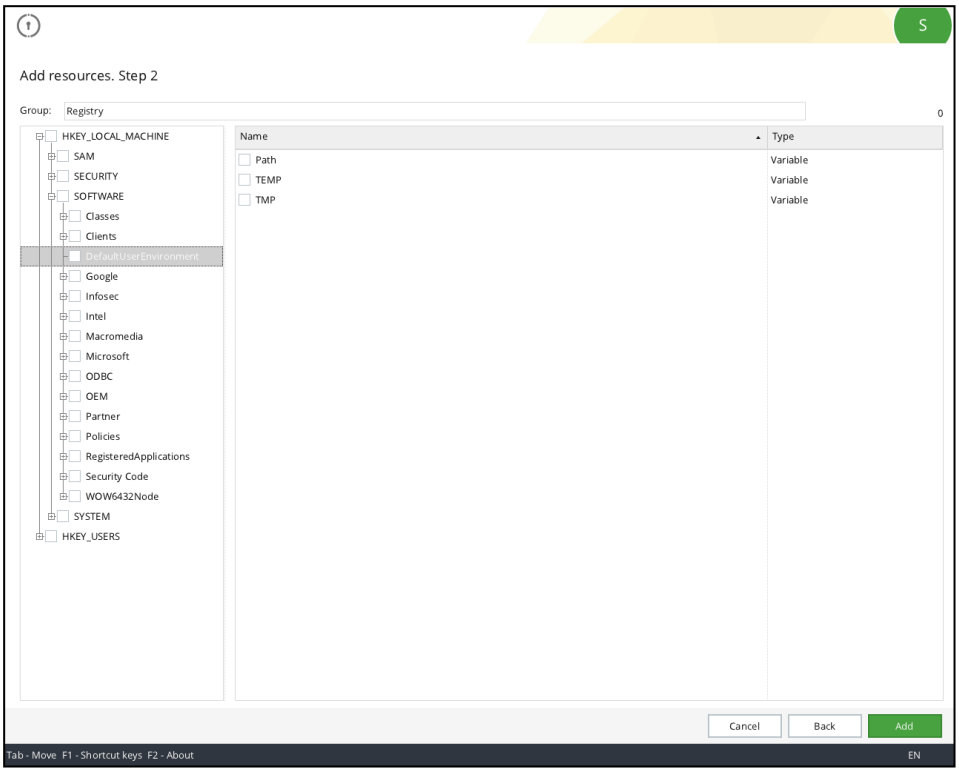
Note. This feature is available only in Windows.

To add registry keys to a group:

1. In the **Add resources. Step 1** window (see Fig. 24 on p. **79**), in the drop-down list, select **Registry key**.

   The **OS volume** drop-down list appears.
2. In the **OS volume** drop-down list, select the required OS volume.
3. Select **Next**.

   A window where you can select the required resources appears.



4. Select the required resources.

> **Note.** Selecting registry keys note that:
> - The selected section may be indicated as follows:
>   - ▣ — the section contents are selected partly/subsections are not opened and the keys are not selected;
>   - ☑ — all the keys and subsections are selected.
> - To select a section that contains subsections, open all the subsections.

5. Select **Add**.

> **Note.**
> - If you add resources while creating a group, select **Create**.
> - To return to the previous step, select **Back**.
> - To cancel adding resources, select **Cancel**.

The selected resources are added to the group. The main window of Built-in IC template management appears.

6. To save changes, select **Save**.

> **Note.** To return to the administrator menu, select **Back**.

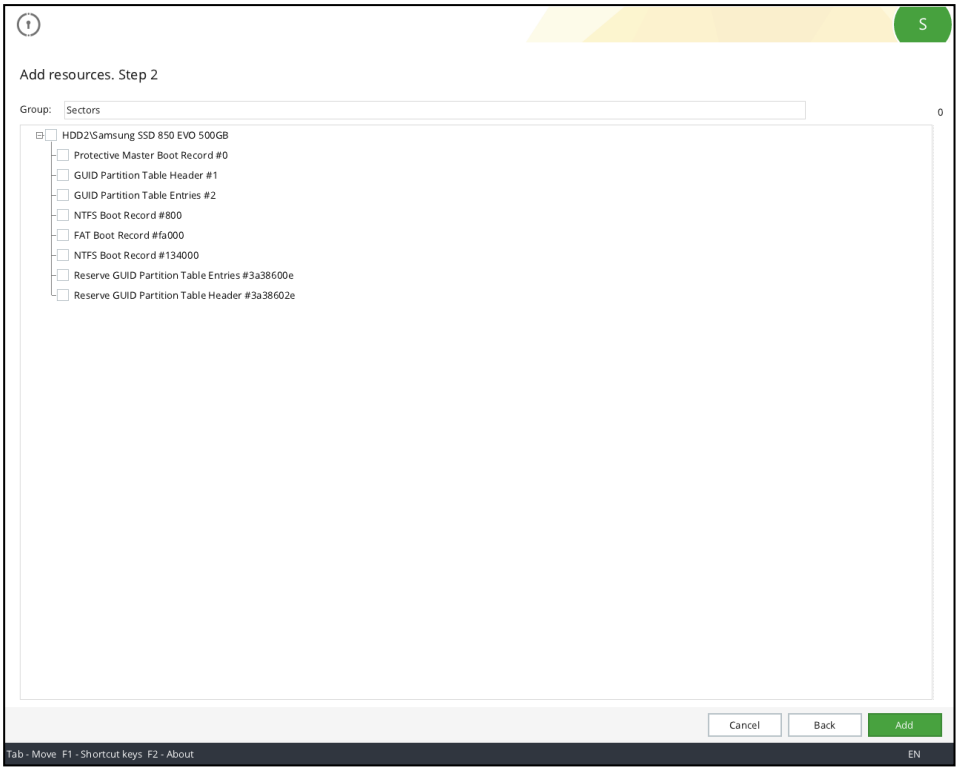
Add drive sectors to a group

To add hard drive sectors to a group:

1. In the **Add resources. Step 1** window (see Fig. 24 on p. **79**), in the drop-down list, select **Drive sector**.

2. Select **Next**.

   A window where you can select the required resources appears.



3. Select the required resources.

> **Note.** Selecting drive sectors note that:
>
> - To select a drive sector, select ☑.
> - To select all sectors in a drive, select ☑ next to the required disk.
> - If you select drive sectors partly, the drive has the following indicator: ■.

4. Select **Add**.

> **Note.**
> - If you add resources while creating a group, select **Create**.
> - To return to the previous step, select **Back**.
> - To cancel adding resources, select **Cancel**.

   The selected resources are added to the group. The main window of Built-in IC template management appears.

5. To save changes, select **Save**.

> **Note.** To return to the administrator menu, select **Back**.

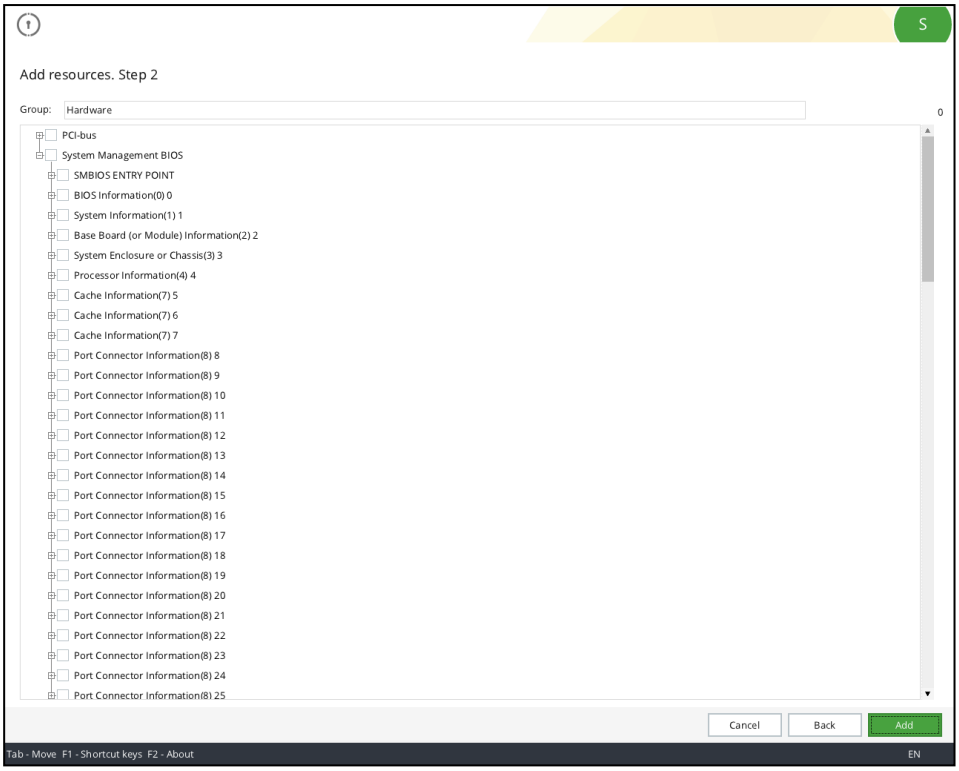
Add device configuration to a group

> **Note.** This feature is available only in Windows.

To add device configurations to a group:

1. In the **Add resources. Step 1** window (see Fig. 24 on p. **79**), in the drop-down list, select **Device configuration**.
2. Select **Next**.

   A window appears as in the figure below.



3. Select the required resources.

Note. Selecting devices note that:

- To select a device, select .
- The selected device groups may be indicated as follows:
  - — the group contents are selected partly/subgroups are not opened and the devices are not selected;
  - — all the devices and subgroups are selected.
- To select a folder that contains subfolders, open all the subfolders.

4. Select **Add**.

Note.

- If you add resources while creating a group, select **Create**.
- To return to the previous step, select **Back**.
- To cancel adding resources, select **Cancel**.

The selected resources are added to the group. The main window of Built-in IC template management appears.

5. To save changes, select **Save**.

Note. To return to the administrator menu, select **Back**.

To enable IC for groups and resources

To enable/disable IC for a group:

1. In the **Groups** section (see Fig. 22 on p. **76**), select the required group.
2. Select:
   - — to enable IC for a group;
   - — to disable IC for a group;

   IC is enabled/disabled for the group and all its resources.

To enable/disable IC for a resource:

1. In the **Groups** section (see Fig. 22 on p. **76**), select the required group.

2. In the **Resources** section, select:
   - — to enable IC for a resource;
   - — to disable IC for a resource;

   IC is enabled/disabled for the resource.

> **Note.** If you manually configured different IC parameters (enable/disable) for resources within a single group, this group has the following icon: .

Managing resources

Group and resource properties

The group and resource properties allow you to rename groups, view the resource data and move resources between groups.

To rename a group:

1. In the **Groups** section (see Fig. 22 on p. **76**), select the required group.
2. Select .

   A dialog box appears prompting you to enter the group name.
3. Enter the group name.

> **Note.** To switch a keyboard layout, press **<F12>**.

4. Select **Save**.

To view the resource data:

1. In the **Resources** section (see Fig. 22 on p. **76**), select the required resource.
2. Select **Properties**.

   A dialog box appears. It contains the following resource data:
   - name;
   - path;
   - type;
   - the list of groups where the resource is located.

To move a resource between groups:

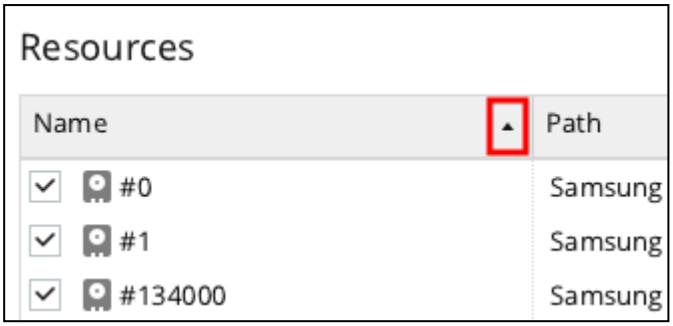
1. In the **Resources** section (see Fig. 22 on p. **76**), select the required resource.
2. Select **Properties**.
3. In the list of groups:
   - select to add resource to a group;
   - select to remove resource from a group.

Sort resources

Resources can be sorted alphabetically (and reversed) by name, path and type.

To sort resources:

- In the **Resources** section (see Fig. 22 on p. **76**), select the sorting command in the required column.



The resources are sorted by the selected column.

Exporting and importing resources

Labels allow matching drives and volumes while importing/exporting resources.

During the export, administrator labels drives and volumes of a computer where the export is performed.

During the import, administrator matches labels from the file being imported with volumes and drives of a computer where the import is performed.

Note. We recommend that you import/export resources between computers with the same configuration and installed software.

You must create the export file before performing the export.

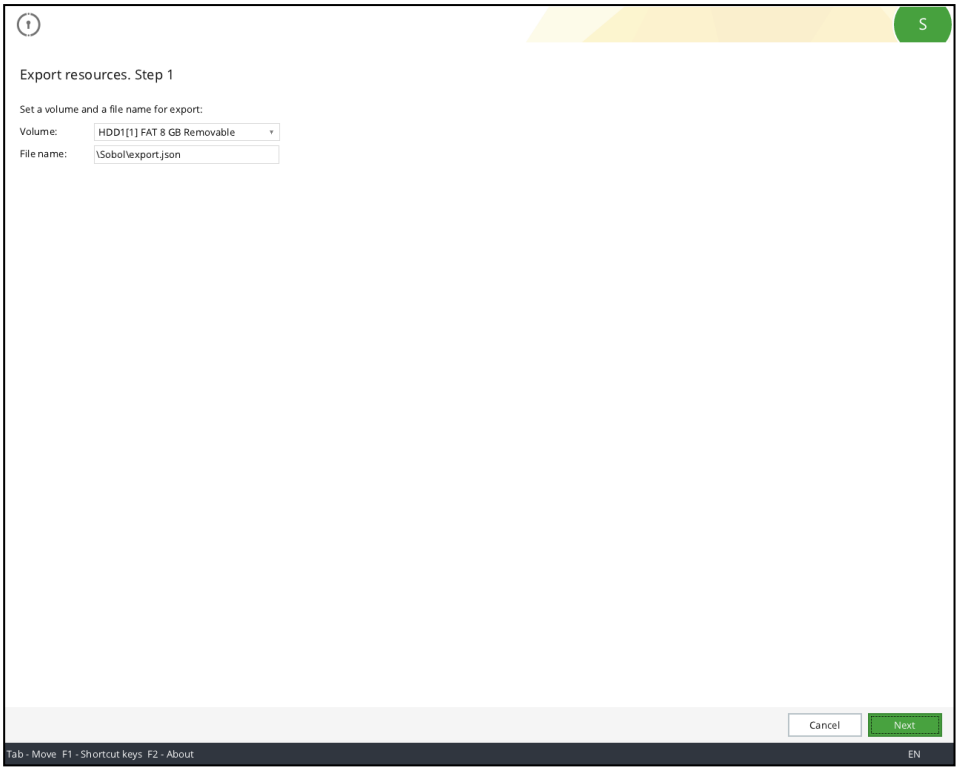
To create an export file:

1. In Windows, run the command prompt; in Linux, run the command line terminal.
2. Go to a folder where you need to create the export file.
3. To create the file, run the following command:
   - in Windows:
     ```
     fsutil file createNew export.json 34000000
     ```
   - in Linux:
     ```
     dd if=/dev/zero of=export.json count=1 bs=32M
     ```

Note.
- You can specify any name for the export file.
- You can create the export file of a larger size.

To export resources:

1. In the **Groups** section (see Fig. 22 on p. **76**), select  .
   A window appears as in the figure below.



2. Specify the export parameters:
   - in the **Volume** drop-down list, select a volume where the export file is located;
   - in the **File name** text box, enter the export file name.
3. Select **Next**.

   A windows appears where you must select the resource groups to be exported.
4. Select the required groups.
5. Select **Next**.

   A window appears where you must set the required labels.
6. Set labels for drives and/or volumes that contains IC objects.
7. Select **Export**.

   The export progress is shown on the screen. .

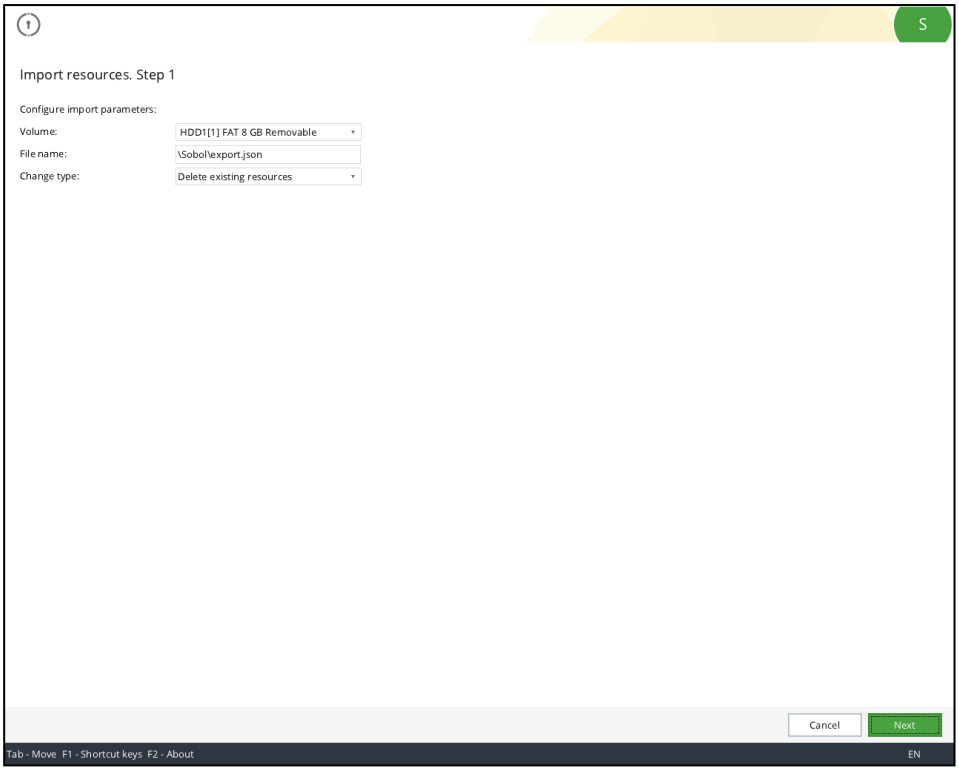
   Note. To stop the export, select **Cancel**.

   When the export is completed, you can see the time spent for the procedure.
8. Select **Finish**.

To import resources:

1. In the **Groups** section (see Fig. 22 on p. **76**), select  .

   A window appears as in the figure below.



2. In the **Volume** drop-down list, select a volume where a file to be imported is located.
3. In the **File name** text box, specify a full name of the file to be imported.
4. In the **Change type** drop-down list, select the required option:

Delete existing resources
All groups and resources of the current IC template are deleted before the import. After the import, the IC template will only contain the groups and resources from the imported file.
Add to existing resources
The groups and resources from the imported file are added to the IC template without deleting already existing resources. Groups can be duplicated during the import. To configure the duplicating, set the Keep existing groups toggle to the respective position: • **ON** — the groups are not duplicated; • **OFF** — the groups that have the same names are duplicated and the imported objects has the following name: **object_nameN** where **N** is the sequence number of the duplicated object. **Note.** Resources are not duplicated.

5. Select **Next**.

   A window appears where you must match the labels from the imported file with the drives and/or volumes.
6. Match the labels with the drives and/or volumes.
7. Select **Import**.

   The import progress is shown on the screen.

   Note. To stop the import, select **Cancel**.

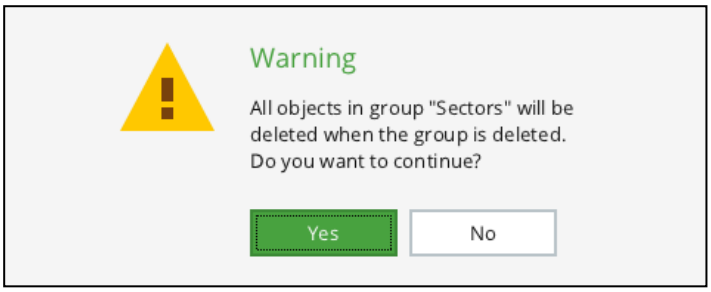
   When the import is completed, you can see the time spent for the procedure.
8. Select **Finish**.

Deleting groups and resources

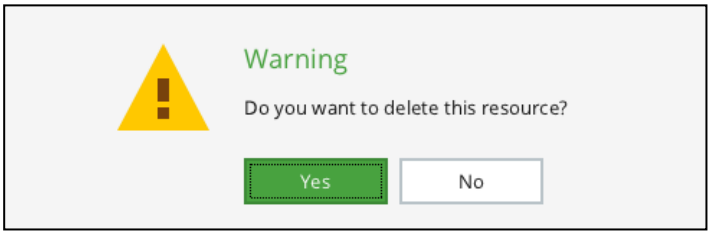
Attention! When you delete a group, all the resources included in this group are deleted as well.

To delete a group\resource:

1. In the **Groups** or **Resources** section (see Fig. 22 on p. **76**), select the required group or resource.
2. Select  .
   - When you delete a group, a dialog box appears as in the figure below.



   - When you delete a resource, a dialog box appears as in the figure below.

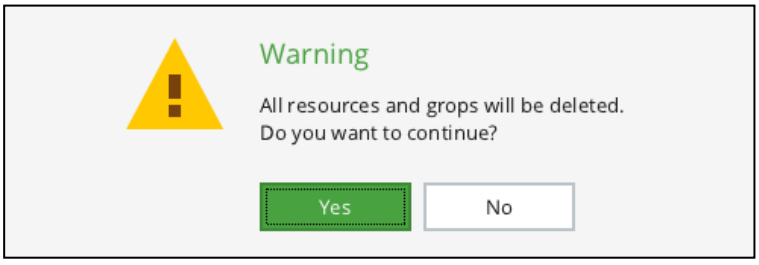


3. Select **Yes**.

Note. To cancel the procedure, select **No**.

To delete all groups and resources:

1. In the **Groups** section (see Fig. 22 on p. **76**), select  .
2. A dialog box appears as in the figure below.



3. Select **Yes**.

Note. To cancel the procedure, select **No**.

Appendix

Sobol messages

Boot error messages

When Sobol boots, errors can occur leading to computer lockout. In this case, the following error messages may appear:

Sobol Card: Watchdog timer triggered. System halted	
Cause	Watchdog timer timeout expired
Solution	Unplug all removable devices from your computer and restart it. If the error occurs again, perform theSobol initialization (see p. **21**)
Sobol Card: Please enable HPET (High Precision Event Timer) in BIOS Setup. System halted	
Cause	HPET (High Precision Event Timer) is disabled
Solution	Restart your computer. In UEFI/BIOS Setup, enable the HPET function.
Sobol Card: Internal error [error code]. System halted	
Cause	An error occurred when accessing the Sobol card
Solution	Restart your computer. If the error remains, contact your Sobol vendor with the error code
Sobol Card: Firmware error [error code]. System halted	
Cause	Sobol nonvolatile memory, which stores Sobol UEFI Option ROM, is damaged
Solution	Contact your Sobol vendor with the error code
Sobol Card: Memory integrity error. Reinitialization required. System halted	
Cause	Sobol nonvolatile memory containing Sobol settings information is damaged. The damage can be a result of restarting the computer while using Sobol nonvolatile memory
Solution	Perform Sobolthe initialization (see p. **21**)
Sobol Card: OS boot forbidden. System halted	
Cause	UEFI/BIOS of the computer motherboard is configured incorrectly
Solution	In UEFI/BIOS Setup, disable **Fast Boot**
Sobol Card: Random numbers generator error. System halted	
Cause	When Sobol starts, the RNG test is performed. If the test result does not comply with GOST requirements, the computer is blocked for all users including the administrator
Solution	Restart your computer. If the test error repeats, check that the Sobol card is connected correctly and that the M.2/Mini PCIe/PCIe connector in which the card is plugged works properly. If the error remains, contact your Sobol vendor

Messages about events that cause computer lockout

When working with Sobol, a number of events may lead to computer lockout. In this case, the following messages may appear:

Password expired. Contact your administrator	
Cause	The user password expired and password change is prohibited by the administrator
Solution	Enable password change for the user (see p. **55**)
Logon is prohibited by administrator	
Cause 1	An administrator has blocked access for this user: the **Current user status** parameter is set to **Blocked** (see p. **54**). The computer is blocked when this user tries to log on
Cause 2	The number of failed logon attempts has exceeded **The maximum number of failed logon attempts** parameter (see p. **25**). Logon for this user is blocked
Solution	To allow this user to log on, set **Current user status** to **Active** (see p. **54**)
Log is more than 90% full. Clear the log or enable event overwriting	
Cause	The Sobol log is 90% full
Solution	The message appears when Sobol successfully booted, logon to the computer is blocked for all users except the administrator. Clear the log (see p. **65**) or enable events overwriting (see **Overwrite events** in Tab. 5 on p. **27**)
User list integrity is violated. Only administrator is allowed to log on	
Cause	While writing information to a user list, an error occurred due to technical reasons (for example, the computer was suddenly switched off), which led to Sobol nonvolatile memory change. As a result, current checksum of the user list calculated at Sobol start do not match the reference checksum. Logon is blocked for all users except the administrator
Solution	Restart the computer. If the error repeats, clear the user list (see p. **56**) and register users again (p. **50**). If the error remains, contact your Sobol vendor
Log integrity is violated. Only administrator is allowed to log on	
Cause	While writing events to the log, an error occurred due to technical reasons (for example, the computer was suddenly switched off), which led to Sobol nonvolatile memory change. As a result, the current checksum of the log calculated at the start of Sobol do not match the reference checksum. Logon is blocked for all users except the administrator
Solution	Clear the log (see p. **65**)
Boot parameters are changed. Boot is denied	
Cause 1	Boot parameters are changed in UEFI/BIOS Setup(e.g. boot order)
Solution 1	Perform one of the following actions: • save a new boot configuration in Sobol (see p. **46**); • return to the previous boot parameters in UEFI/BIOS Setup
External drive is selected for boot. Boot is denied	
Cause	A user tries to boot an OS from a removable device when it is prohibited
Solution	Perform one of the following actions: • disconnect the removable device; • allow the user to boot OS from the removable device by changing settings in the user's account. Tutn off the **Deny booting from external drives** toggle (see p. **55**)

Warning and information messages

The following Sobol messages notify about incorrect actions or inform about the current Sobol state.

Note. This section does not provide information about messages that describe further actions. Such messages and recommendations can be found in the respective procedures.

Messages when entering password

Entered passwords do not match	
Cause	When registering an administrator/a user or changing the administrator/user password, the confirmed password does not match the entered password
Solution	Enter the password again
Minimum password length is ... symbols	
Cause	When registering an administrator/a user or changing the administrator/user password, the number of characters in the entered password is less than set in **Minimum password length** (see p. **28**)
Solution	Enter a password of allowed length
The new password matches the old one	
Cause	When changing an administrator/a user password, a new password matches the current one. The message appears if **The minimum number of new characters** has another value than 0 (see p. **29**)
Solution	Enter the password, that differs from the current one
Not enough new characters compared to the old password	
Cause	When changing an administrator/a user password, the number of new characters in a new password is less than the **Minimum number of new characters** (see p. **29**)
Solution	Enter the password that differs from the current one by the number of characters greater than or equal to the **Minimum number of new characters** (see p. **29**)
Password must be at least N characters	
Cause	When changing a user password, the number of characters in a new password is greater than the **Minimum password length** value, but differs from the current password by less number of characters than **The minimum number of new characters** (**N** in message). The message does not appear if the user's password changed by an administrator
Solution 1	Suggest that the user set a password with at least N characters
Solution 2	Set **The minimum number of new characters** equal to or less than the **Minimum password length** value

Messages when registering user

A user with this name already exists	
Cause	A new user's name already exists in the Sobol user list
Solution	Change the user name and reenter it
Security token is already registered on this computer	
Cause	When registering a new user, a security token assigned to another user registered on this computer is presented
Solution	Assign a security token to the user again, presenting a security token that not assigned to the other users of this computer

Log messages

Log is 70% full	
Cause	The Sobol log is 70% full
Solution	The message appears to inform a user and an administrator. Continue your work
Failed to export log to file	
Cause	The error occurred while exporting the log
Solution	Create a new file to export the log and try to export the log again (see p. **65**). If the error remains, contact Security Code technical support
File not found	
Cause	The file to export the log is not found
Solution	Create a new file to export the log and try to export the log again (see p. **65**)

Messages when using security tokens

This security token does not belong to current user	
Cause	The presented security token does not belong to the current user
Solution	Present the current user's security token
Invalid security token PIN ...	
Cause	The entered PIN is incorrect
Solution	Enter the correct PIN
Invalid password or security token	
Cause	The presented security token is not registered in Sobol, or the entered password does not correspond to the presented security token
Solution	Present your own security token, enter the correct password

Integrity check messages

When integrity check errors are detected, the following messages displayed in the tables below appear.

Note.

- If an integrity check error occurs when a user logs on to Sobol in hard integrity check mode, the computer is blocked.
- Messages may differ while working with the Sobol software and Built-in IC template management.

Calculate checksums

Checksum calculation finished with error	
Cause	An error occurred during calculation of IC object checksums
Solution	Find out and fix the cause of the error. Calculate checksums

Integrity check objects control

IC object contents are changed	
Cause	The reference checksum of IC object does not match the current checksum calculated for this object
Solution	Find out and fix the cause of the IC contents change. Calculate checksums
IC template contents are changed	
Cause	The contents of IC templates are modified

Solution	If IC templates' modification is caused by adjusting a list of controlled objects via the IC template management software (built-in or auxiliary), calculate checksums. In other cases, find out the cause of IC templates' modification, fix it, then calculate checksums
Failed to save IC template settings	
Cause	An error occurred while writing data to IC templates
Solution	If the templates were changed after the list of controlled objects was edited using either the Sobol software or Built-in template management, calculate checksums. In other cases, determine the cause of the problem and calculate checksums
Failed to read IC template settings	
Cause	An error occurred while reading IC templates
Solution	Create new IC templates and calculate checksums
Failed to read IC object	
Cause	Calculation of checksums for this IC object failed. Getting access to read IC object failed
Solution	Find out and fix the cause of denied access to read IC object. Calculate checksums
IC object not found	
Cause	Specified IC object is not found
Solution	Find out and fix a cause of IC object not being found. If necessary, exclude this object from IC templates and calculate checksums
IC templates are not found in standard Sobol folder	
Cause	IC templates or the standard folders for the IC templates are not found. The standard IC template folders: • in Windows OS: in folder **\Sobol**; • in Linux OS: in folders **/sobol** and **/boot/sobol**
Solution	Using the Sobol software: • to create the IC templates, install/reinstall the Sobol software; • to use the existing templates, specify the volume and the folder that contain the required IC template. Using Built-in IC template management: • to create the IC template, follow the procedure on p. 75; • to use the existing templates, specify the volume and the folder that contain the required IC template.
IC templates are corrupted	
Cause	The IC templates' structure is violated
Solution	Create new IC templates and calculate checksums
Transaction log error on volume containing file with templates	
Transaction log error on volume containing checksum file	
Transaction log error on volume containing IC object	
Cause	Transaction log may contain data about incomplete modifications
Solution	Boot the OS. When exiting the OS, close all file operations
Unsupported IC template format	
Cause	The IC template file format is not supported by Sobol
Solution	Contact your Sobol vendor
Failed to save IC template backup	

Cause	Sobol standard folder does not contain IC templates backup. But modifications saved in main IC templates
Solution	Enter the OS and create a file named **icheck_backup.json** in the Sobol standard folder (see p. **75**)

Sobol test errors messages

If errors detected while testing Sobol performance (see p. **67**), the following messages appear.

RNG test errors

RNG channel 0 test finished with error ... times from ... attempts	
RNG channel 1 test finished with error ... times from ... attempts	
Cause	The specified number of Sobol RNG tests failed. The test checks whether the generated number distribution is uniform.
Solution	Repeat the RNG test. If the error remains, contact Security Code service department

Security token test error

Failed to read data from this security token	
Error while writing data: security token failure	
Cause	An error occurred when writing/reading data to/from a security token. The security token or the reader may be damaged
Solution	Present another security token and repeat the test. If the test finished successfully, the security token/reader works properly. Format the previously presented security token and repeat the test. If the error remains, the security token may be damaged, contact Security Code technical support
Error while reading security token: no device found	
Cause	While performing all tests consecutively a security token was not presented during a security token test
Solution	Present the security token and repeat the test or check the security token separately

Events logged by Sobol

Event	Event description
Administrator changed password of user	An administrator has changed the password of a user, which name is specified in the second column in a table of records
Administrator logon	An administrator has successfully logged on to the computer
Administrator password was changed	An administrator has changed his/her password to log on to the computer
Administrator Secure ID was changed	An administrator has successfully changed his or her security ID
Checksum error in security token memory	An error when testing security token IC is detected

Event	Event description
Checksums are not calculated	An administrator have not set integrity check after Sobol initialization, checksums have not been calculated. If a user tries to log on in hard IC mode, his or her access is blocked
Checksums were automatically recalculated	Reference checksums are calculated on an external program request
Checksums were recalculated	Reference checksums are recalculated
Error while exporting log	The size of exported events is larger than the size of file for the log export
External request error	A request from Sobol nonvolatile memory, received from external programs, can not be processed
External requests were processed	Requests from Sobol nonvolatile memory, received from external programs, are processed with no errors
Failed to update IC key	An IC key for calculating checksums of IC objects is not updated on specified time due to errors detected when checking objects' IC before an OS boots
IC key was updated	An IC key used to calculate checksums of IC objects is successfully updated
IC were changed	IC templates are modified
Integrity check error	Current checksums do not correspond to the reference checksums while checking objects' integrity before the OS boots
Invalid password	When logging on, you have presented a security token that assigned to a registered user, but have entered an incorrect password. Security ID has been previously changed twice using another Sobol, and a user has never logged on this computer
Last logon time was adjusted	The last time of a user's logon is modified according to the computer's time changed by an administrator
Log was deleted	An administrator cleared the Sobol log
Log was exported	Export of the Sobol log is completed
Logon attempt limit was exceeded	The number of failed logon attempts of this user has exceeded the maximum number
Main boot drive parameters were changed	The main boot disk of the computer is changed
New user was added	An administrator has added a new user to the Sobol users' list
Password configuration time/date was forward system time	User password setting time or date outpaces the time or date set on the protected computer
Request: Add user	Inquiry to add a new user to the Sobol users' list is received from an external program and successfully processed
Request: Delete user	Inquiry to delete a user from the Sobol users' list received from an external program and successfully processed
Resources were exported	Resources are exported from an IC template
Resources were imported	Resources are imported into a IC template

Event	Event description
Security token was not registered	When logging on, you have presented the security token that does not belong to any of users registered on this computer. The password entered by an administrator is incorrect
Sobol was switched to joint mode	The Sobol joint mode is enabled by an administrator
Sobol was switched to standalone mode	The Sobol standalone mode is enabled by an administrator
System date was set back	When Sobol boots, forced system time setting back is detected
System time and date were changed	Time and date are changed by an administrator during Sobol operation
User logon	A user has successfully logged on to the computer
User password was changed	The user, which name is specified in the third column in a table of records, has successfully changed his or her password
User Secure ID was changed	The specified user has successfully changed his or her security ID
User was blocked	The user, whose logon is blocked, tries to log on
User was deleted	An administrator has deleted a user from the Sobol users' list

Operation in joint mode

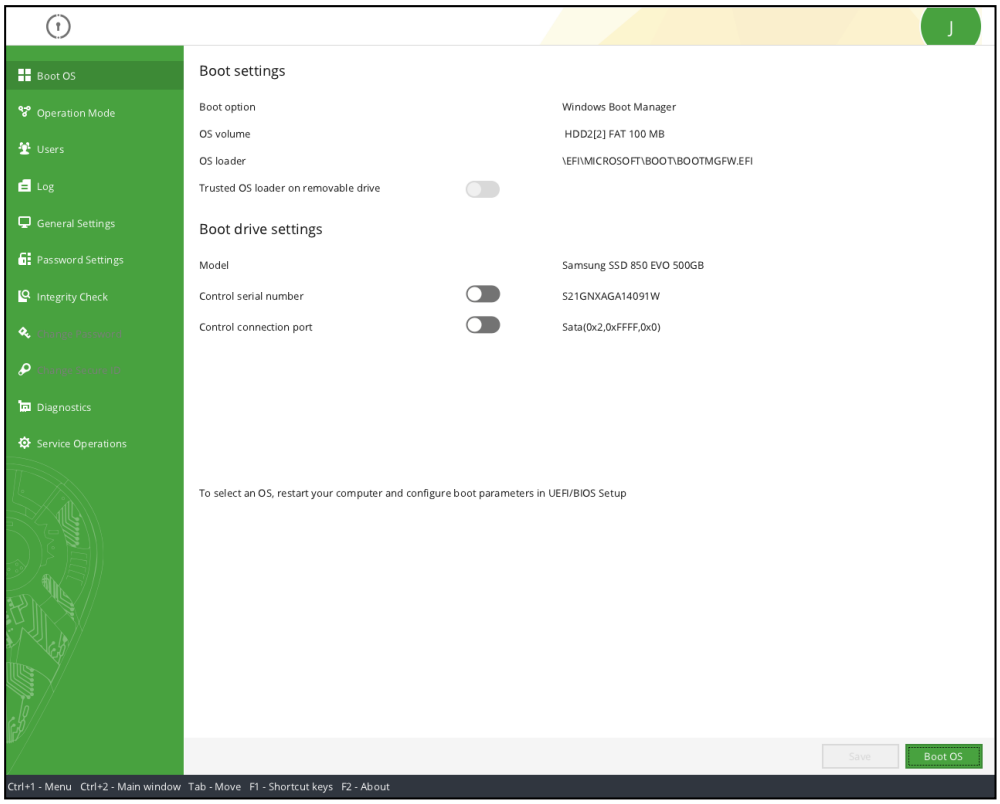
The joint mode allows you to use Sobol in tandem with other information security products (for example, Secret Net Studio). In this case, the product that operates in tandem with Sobol gets a part of control functions.

Note that when switching Sobol to joint mode:

- some general parameter management is limited;
- password parameters cannot be configured;
- user management is limited;
- password and Secure ID cannot be changed;
- IC mechanism management is limited;
- log management is limited.

Administrator menu

In joint mode, the Sobol administrator menu is changed.



General settings

During the initialization, in the **Cryptographic kernel** drop-down list, select **1989**.

In joint mode, you can not manage the following parameters:

- **Show statistics to user**. The parameter is **Off** by default, the information window does not appear when a user logs on;
- **The maximum number of failed logon attempts**;
- **Automatic logon timeout**;
- **Sound**.

You can find detailed information in Tab. 4 on p. **25**.

Password settings

In joint mode, password settings can not be configured by means of Sobol. Settings can be configured by the tools, that operate in tandem with Sobol.

To find detailed information about password settings, see Tab. 6 on p. **28**.

User management

In joint mode, the administrator is only allowed to view the user list and not allowed to modify it in any way, including modifying account settings.

User settings are managed via an information security tool that operates in tandem with Sobol.

Change password and Secure ID

In joint mode, niether the administrator nor users can change a password and a Secure ID using Sobol.

These operations can be performed via a product that operates in tandem with Sobol.

Integrity check and checksums calculation

In joint mode, the administrator can choose an IC template volume and a folder, as well as calculate the checksums of IC objects. The other IC settings are configured via an information security tool that operates in tandem with Sobol.

Work with log

In joint mode, the following functions are disabled when working with thelog:

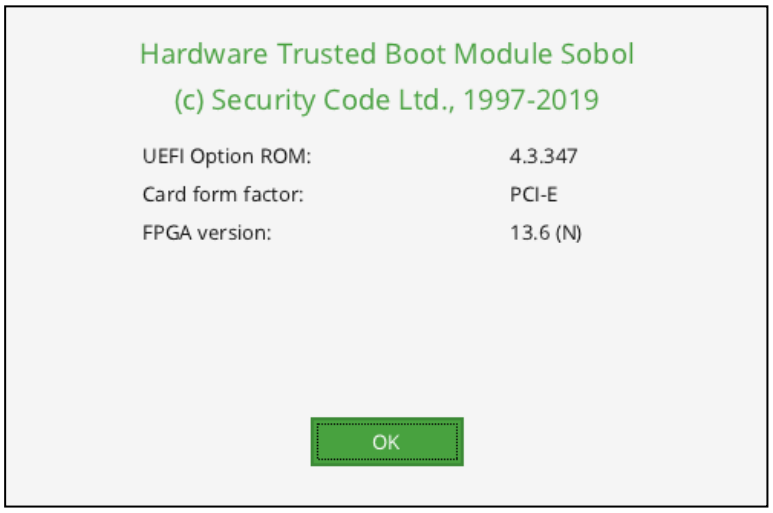
- log clearing;
- setting **Maximum log size** and **Audit frequency**.

To make use of these functions, use the information security tools that operate in tandem with Sobol.

To find detailed information about Sobol log settings, see Tab. 5 on p. **27**.

Information window

To see Sobol information, press <F2>. A window appears as in the figure below.



The window contains the following information about Sobol:

Parameter	Note
UEFI Option ROM version	The current version of UEFI Option ROM
Card form factor	Sobol card form factor
FPGA version	The current version of FPGA configuration

Taking screenshots

While working with Sobol, you can take screenshots.

To take screenshots:

1. In the root directory of a removable device, create folder **sblscreenshots**.
2. Connect the removable device to a computer with Sobol.
3. To take a screenshot while working with Sobol, press <**F11**>.
   The screenshot is stored to the folder **sblscreenshots**.

Glossary

A	
ACPI tables	ACPI tables store hardware and software interfaces information to provide motherboard components configuration and registration
Authentication	The process of verifying the identity of a subject basing on a presented security token
C	
Checksum	A sequence of digits calculated according to a certain algorithm to check for data corruption or modifications
I	
Identification	The process of recognizing a subject (object) by his, her or its identifier
Identifier	A unique feature that identifies an access subject
Integrity check	The process of software and hardware check for corruption or modifications
L	
Log	The storage of data about Sobol events, for example, logon attempts
R	
Reader	An electronic device that reads security tokens
Registry	A hierarchical database that stores low-level settings for the Windows OS
Registry key	A unique entry in the Windows OS registry. Registry keys may contain instructions to which the Windows OS and applications refer and other registry keys.
Registry value	Registry data stored in a registry key. Each value is defined by its name and type
S	
Security token	A physical device on which coded identification information is stored. Sobol supports the following security tokens: IButton keys, USB keys and smart cards (see Tab. 1 on p. **8**)
SMBIOS structures	SMBIOS structures store motherboard components data about manufacturers, a processor, system slots, memory, UEFI/BIOS, etc
System subject	An active component of an information system, usually a user or a device that causes changes in this system
U	
Unauthorized access	An act of illegally gaining access to objects

Documentation

1. Hardware Trusted Boot Module Sobol. Version 4. Administrator guide.
2. Hardware Trusted Boot Module Sobol. Version 4. Administrator guide. Sobol software.
3. Hardware Trusted Boot Module Sobol. Version 4. User guide.
4. Hardware Trusted Boot Module Sobol. Version 4. Getting Started.