SafeGuard®

SAFEGUARD SGT PRO PLUS

PERSONAL GROUNDING TESTER WITH DUAL FOOT ELECTRODE, RFID READER, LCD DISPLAY AND OPERATING SOFTWARE

INSTRUCTION MANUAL



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ABOUT THE SGT PRO PLUS

- Tester for checking personal grounding before entering an ESD protected area (EPA)
- Testing footwear system and wrist strap/groundable ESD smock system at the same time
- Can be used to test a groundable ESD smock system
- Test result indication on LCD display, with LED light and sound
- For indoor use only

The SafeGuard SGT Pro Plus is a tester for checking personal grounding before entering an ESD protected area (EPA). It may be a good choice if you want to identify persons entering the site. Tester with the LIGHT BAR system – such SafeGuard products have a steel touch button, the measured results are indicated by LED lights. COMFORT system product – such SafeGuard devices have touch button and RFID reader, an RFID card is required for use, which includes the type of test to be used. This type can be: 1. Footwear system test 2. Wrist strap/groundable ESD smock system test 3. Footwear system and wrist strap/groundable ESD smock system combined test 4. VIP test. The test can start after the card has been scanned. Thanks to the dual foot electrode, the tester simultaneously measures the resistance of the right and left foot relative to the hand. After the test, the measured values are displayed on the built-in LCD display. The measured results are stored on an internal SD card. The tester can be connected to a gate using the relay output (e.g. to a turnstile entrance gate, swing gate, etc.). It can be installed on an entrance gate, table, wall or stand. It is also possible to configure it so that a test can be carried out without touching the touch button, but an RFID card is required in this case too. The product is supplied with an operating software and can operate individually with this. If required, a management software called SGT Manager can be purchased to configure it over a LAN network and to retrieve the measured results. The system assigns a test method to users and manages their identification data. It saves the entry data as .csv files (compatible with Excel and text editor) and automatically logs daily events.

It is recommended and sufficient to purchase only one management software if several testers are purchased and networked. Purchasing and networking multiple management software with multiple testers can lead to communication and system malfunctions. If you have several testers and you do not network them, but use them as separate devices, please buy individual software for each device to configure and collect data over the LAN network.

The tester is supplied with manufacturer's calibration certificate, dual foot electrode, mounting plate, universal holder and adjustable holder.

CE declaration

We declare that the SafeGuard SGT Pro Plus product complies with the requirements of IEC 61340-5-1, ANSI/ESD S20.20 and Directive 2001/95/EC (General product safety).

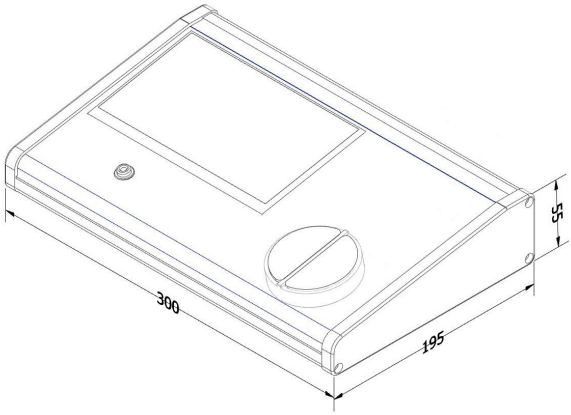
Warning

The device can deliver an effective output power of up to 20 µA or less at a maximum voltage of 100 V for 2-4 seconds at 0,5 second cycles. Therefore, persons with an implanted electronic device (e.g. insulin pump, pacemaker, etc.), known or acute hear rhythm disorders and other disorders of the heart's impulse generation and conduction, seizure disorders (e.g. epilepsy) should consult their doctor before using this device.

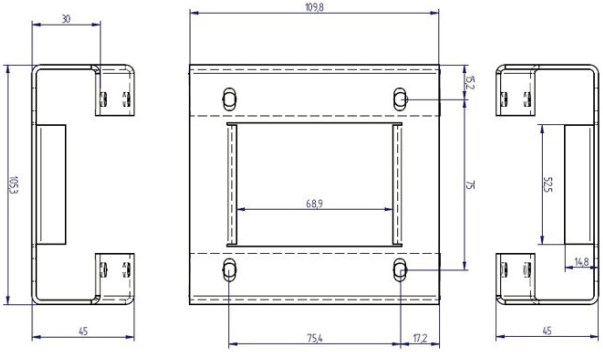
TECHNICAL INFORMATIONS

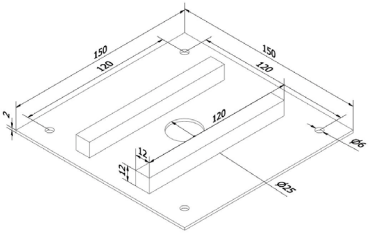
Resistance values indicated as acceptable by the tester	
Default setting when measuring footwear system	100 KΩ – 100 MΩ
You can also set an upper value of 35 MΩ, see the SGT Manager management software description.	
Default setting when measuring wrist strap/ groundable ESD smock system	750 KΩ – 35 MΩ

Operating system	Linux Raspbian
	The tester can be configured via LAN network using RJ45 cable
Test voltage	100 V DC
Wrist strap/groundable ESD smock system connection	With a combined 10 mm snap, 4 mm banana plug socket
Power supply	12 V DC
Relay outputs	0,5 A/60 V *Pass relay (Normally Open) with green wire* *Fail relay (Normally Open) with red wire*
Sizes	300 x 195 x 55 mm (tester) - the touch button and the RFID reader emerges from it beyond this, the tester extends 14 cm backwards beyond the platform. The size of the platform itself: 500 x 490 x 20 mm Tilt angle of the stand: 5 degrees
ON/OFF	Make sure that the SGT Pro Plus is only switched on and off using the shutdown button on the top of the device. Pulling out the mains plug during operation may damage the device.



Mounting plate sizes





Order codes

SGT Pro Plus	Personal grounding tester with dual foot electrode, RFID reader, operating software, mounting plate and universal holder

PARTS OF THE TESTER

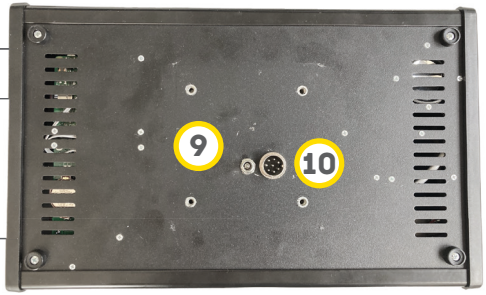
1.	Steel touch button with 9 RGB LEDs
2.	Combined 4 mm banana plug and 10 mm snap socket for connecting wrist strap/ groundable ESD smock
3.	RFID reader
4.	LCD display



5.	Green 4 mm banana plug socket: calibration test point
6.	USB 2.0 socket
7.	LAN socket
8	Shutdown button

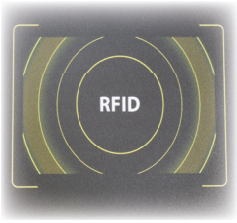


9.	12 V power supply connection socket
10.	8-pin socket which can be used to connect foot electrode wires and relay output wires, but if you place the tester on a stand, it is also worthwhile to connect the power supply through this.



RFID reader

Multifunctional unit that can handle cards that comply with most known RFID standards:



LF reader (low frequency), 125/134 kHz types:
eMarine (EM4100, 4102, 4200), HID ProxCard II, Indala, Indala, Kantech, ISO 18000, ISO 11784/85 HDX, ISO 11784/85 FDX(-B), TI RFID (Tiris, e.g. RI-TRP-R4FF, RI-TRP-W4FF), Casi Rusco, HITAG 1/S, HITAG 2

HF reader (high frequency), 13,56 MHz types:

ISO-14443A type of encoders: Mifare Classic (1k/4k), Mifare Ultralight, Mifare DESFire, Mifare Plus, Mifare ProX, Mifare SmartMX

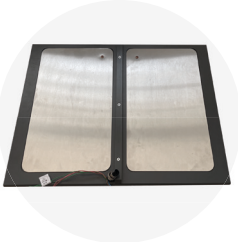
ISO-15693 type of encoders: Texas Instruments TAG-IT Plus, Texas Instruments TAG-IT Standard, Texas Instruments TAG-IT Pro, PicoPass, HID iClass, Legic Advant

ISO-14443B type of encoders: SRI512, SRT512, SRI4K, SRIX4k, ISO-14443B type card emulation

ISO-18092/NFC type communication: active P2P communication according to NFCIP-1, NFC card emulation (passive), mobile phone with NFC function (Android, iOS, Windows Mobile) in the modes listed previously

ITEMS SUPPLIED WITH THE TESTER

1. Dual foot electrode with wire and relay connector



In case of a tester version which is to be mounted on wall/table/entrance gate

2. Universal holder // Universal holder with adjustable angle









In case of a tester version which is to be mounted on wall, fix the tester on the universal holder as shown on page 8 step #2.

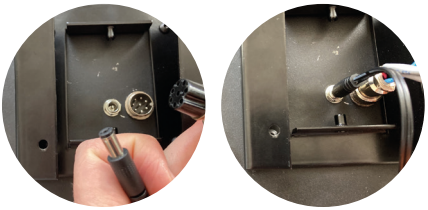
In case of a tester version which is to be mounted on table/entrance gate, fix the tester on the universal holder as shown on page 9 step #2.

In case of a tester version which is to be mounted on stand, fix the tester on the universal holder.

3. Mounting plate



Wall version

1.	Screw the mounting plate or the universal holder with adjustable angle to the wall.	
2.	Fix the tester to the universal holder with screws in the direction shown in the picture	
3.	Connect the wires of the dual foot electrode and the relays using the 8-pin connector and also the adapter	
4.	Connect the device to mains voltage	
5.	Slide the tester with the holder onto the mounting plate	
6.	Remove the protecion foil from the foot electrode plates	

7.	The tester is ready to use	

Entrance gate or table top version

1.	Fix the tester to the universal holder with screws in the direction shown in the picture	
2.	Connect the wires of the dual foot electrode and the relays using the 8-pin connector and also the adapter	 
3.	Remove the protecion foil from the foot electrode plates	
4.	Connect the device to mains voltage	
5.	The tester is ready to use	

OPERATION INSTRUCTIONS

1.	Step with both feet on the middle of the foot electrode plates	
2.	When testing a wrist strap/groundable ESD smock system, connect the wrist strap/ groundable ESD smock to the tester socket	
3.	Place the RFID card you want to use on the RFID reader	
4.	Touch both halves of the steel touch button at the same time and keep your hand on it while testing is in progress	
5.	The tester will give a light and sound signal. If the test values are correct, the whole touch button flashes green, if even one value is incorrect, it flashes red. You can read the details on the LCD display, which also shows the test result.	
6.	An upper resistance limit of 35 MΩ can be set for the measurement of a footwear system, see the SGT Manager management software description	

SGT MANAGER
MANAGEMENT SOFTWARE
FOR SAFEGUARD SGT PRO PLUS TESTERS

USER GUIDE

1. Basic information about SafeGuard ESD testers that can be managed with SGT Manager

The SafeGuard SGT Pro Plus ESD testers can be used in standalone and networked modes, and do not require a central server. This also means that they can be used in the event of a network failure or server downtime. However, we recommend networking them, as this allows the person responsible for ESD protection to configure them and report data remotely from his/her own computer. SGT Manager can also be installed and used without network access using the installation files. The SafeGuard SGT Pro Plus ESD testers include Raspberry PI mini computers. They are widely distributed and there is a lot of free software available for them on the Internet. However, to ensure the security of the data needed to run the ESD testers, we do not recommend using any software other than SGT Manager to control the testers.

2. Information on how to use SGT Manager

2.1 Software requirements

SGT Manager has been developed to be used on standard computers running Windows 10. Beyond that, there are no specific requirements. An average computer that can be used to browse the Internet is sufficient.

2.2 Hardware informations

2.2.1 Network connection

Our recommended solution for remote access is a LAN connection with fixed IP addresses on the connected testers. WIFI can also be used, but is less recommended from a stability point of view. SGT Manager uses SCP and SFTP to connect to testers, which protocols require IP addresses for communication, so PieManager needs to be given the IP address of the testers. In most cases DHCP is used to assign IP addresses within a network. So it may happen that the IP address of a device changes, for example after a reboot. In such a case, SGT Manager will not be able to connect to the tester. Ask network administrators therefore to allocate fixed IP addresses to testers, if possible.

2.2.2 Space required for log files on the hard disk

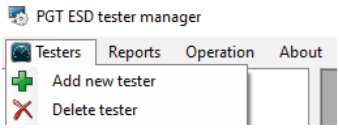
An important feature of SGT Manager is the copying of test event log files from tester(s) to computer. Entries to the EPA are roughly 100 bytes of data in a log file, the exact number depends on several factors, but it is a good estimate to use this as a guide. If 1000 people works at the EPA, and there are usually 3000 logins per day, it can be estimated that this would mean roughly 300 kB of data per day, or 100 MB per year.

3. Installation

To install SGT Manager, have administrator rights and run the setup.exe file included in the installation files. Follow the on-screen instructions. The installation is very simple, as you need to enter the settings the first time you run the program, not during installation.

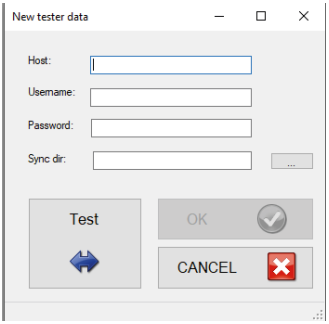
4. Using the program

The main window of SGT Manager consists of two parts. On the left is the testers' list in an expandable list, empty on first run. The area on the right is for displaying forms and reports.



4.1 Loading and managing the list of testers

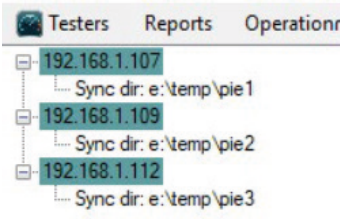
You can upload new testers one by one using the „Testers" menu item – by clicking on „Add new tester".



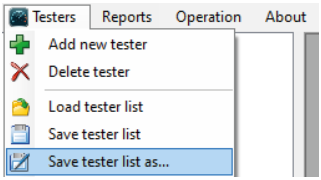
Fill in the dialog box that appears. Use the IP address of the tester (which is hopefully fixed), which you will find at the top of the tester's display if the tester is properly connected to a network, router. You can leave the „Username" and „Password" fields blank, you can connect to the tester without filling them in, and they can be used to improve seucrity if required. Click on the „Test" button to check the connection to the tester.

In order to be able to press the „OK" button, browse a folder for the data from the tester. SGT Manager will save files to this folder and later synchronize the data from the tester with the data in this folder as well.

IMPORTANT: If you use more than one tester, please provide a separate folder for each tester here.



If you have added testers to the list, you will see a picture similar to the one on the left. SGT Manager shows the testers in an expandable list with the local folder used for synchronization. The dark green background indicates that the tester has not yet been synchronized during the current run of SGT Manager.



If you added a list of testers to the program and you want to use it later again, save the list to a file so that you can easily load it next time. To do this, use the „Save tester list as…" option under „Testers" menu. If necessary, you can create different tester lists, for example for different buildings or business units.

You can load a previous tester list by selecting „Load tester list" from the „Testers" main menu. You can also configure SGT Manager to automatically load a tester list on startup and to start the synchronization of test results. See Chapter 5 for more information on this.

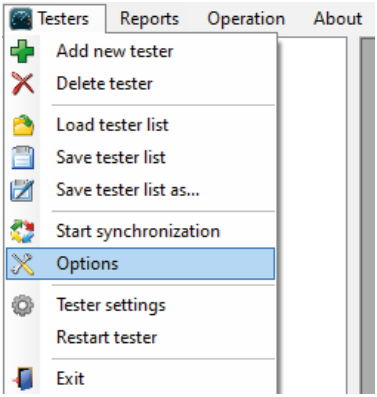
4.2 Processing of user data

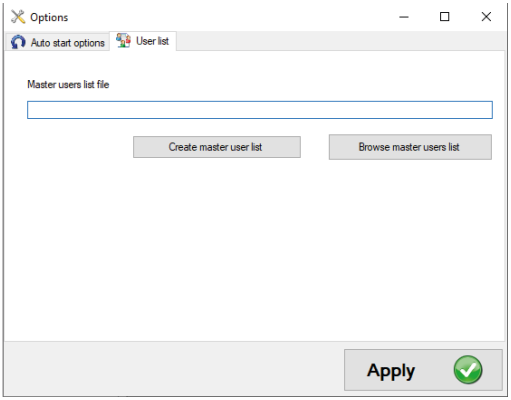
4.2.1 Master list of users

The software can collect all user data from testers in a user master list.

4.2.1.1 Create a user master list

The first time you use the software, SGT Manager does not include a user master list. You can create one using the „Options" menu item in the main menu „Testers". You can use the „Create master user list" button on the second tab „User list". Enter the location of your choice and click on „Apply".

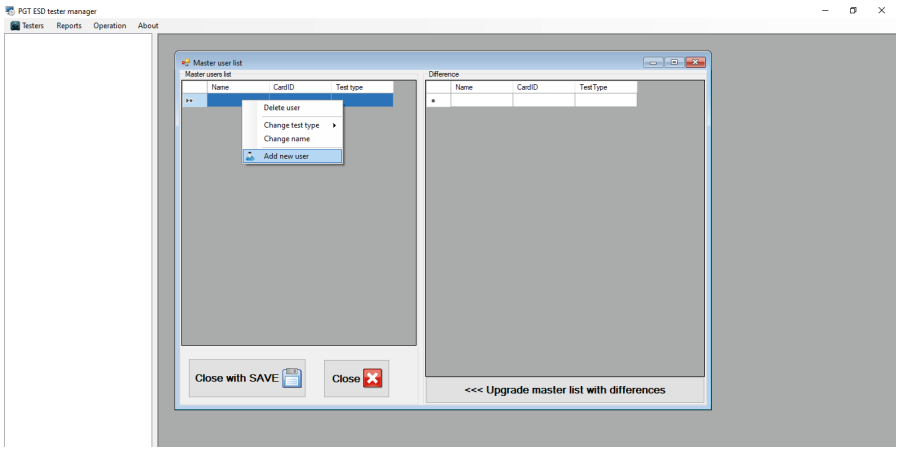


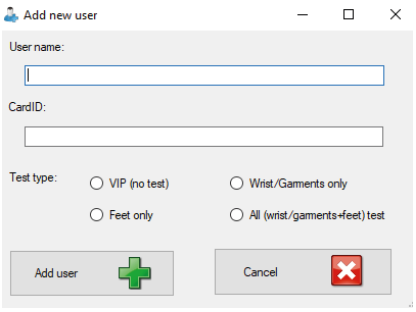


4.2.1.2 Ways to create a new user

1. Adding a unique new user

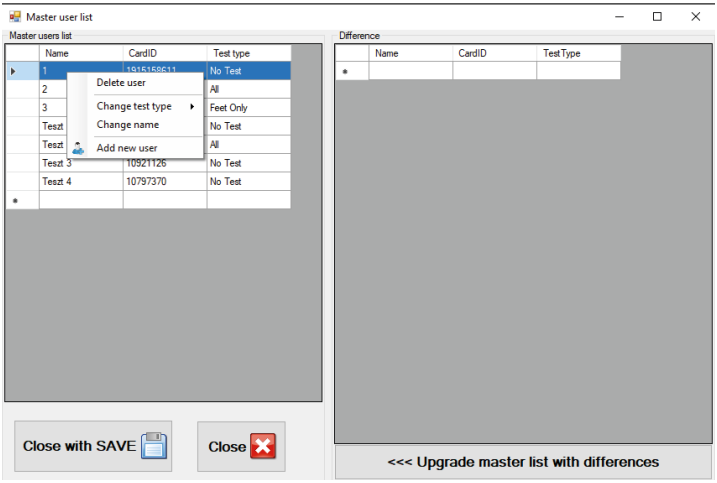
By clicking on „Edit master list" under the main menu item „Operation" and then right-clicking in the list on the left or in the dark grey area around it, you can select „Add new user".





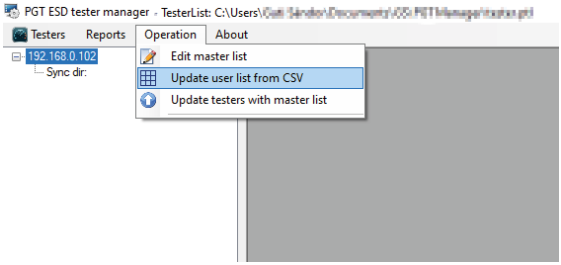
2. Using a new RFID card

If a user uses an RFID card at a tester that is not yet in the system, it will be entered in the tester database as „unknown user". To change the name and tester type of the card, select „Edit master list" under the main menu item „Operation". Once the master list is updated („Upgrade master list with differences"), you can make these changes by right-clicking on the left list and selecting the menu.



3. Upload a list file

You can also upload new users using a list in a CSV file. Use the „Update user list from CSV" menu in the main menu „Operation". After selecting this menu item, upload the file with the data in a simple format, in three columns: user name, card number, test type.

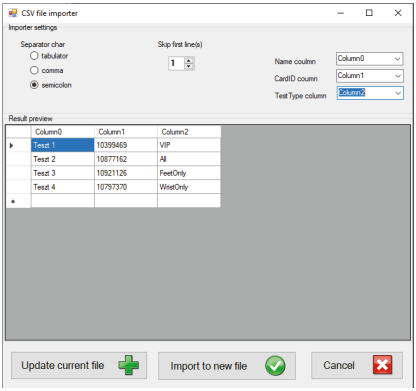


In the „CSV file importer" window that appears, you can configure several settings:

1. At the top left, set the delimiter character used in the file. You can use commas, semicolons or tabs in the list, but only one of these at a time within a CSV. Whichever you choose will update the table below. Three columns should appear.

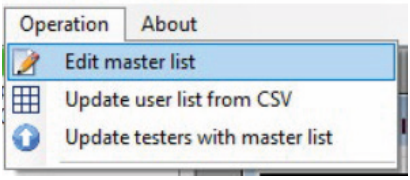
2. A CSV file usually has a title bar. In the „CSV file importer" window, at the top centre, you can specify the number of rows to be skipped by the software when processing, starting from the first row in the table.

3. In the top right of the „CSV file importer" window, you can select the columns containing the data.

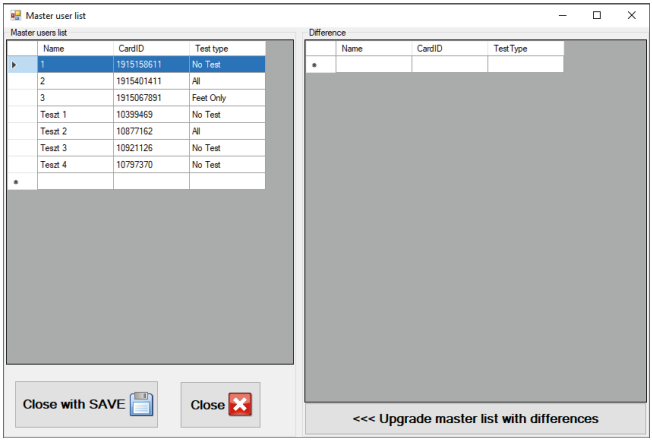


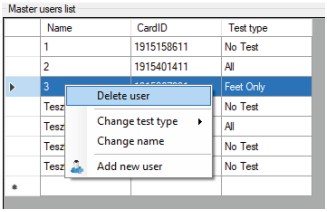
After that, use the „Update current file" option if you want to add new users to the currently used user master list. You can also create a new user master list by clicking on „Import to new file".

4.2.1.3 Editing the user master list



Use the „Edit master list" menu item under the „Operation" main menu to open the master list editing window. It has two sides, on the left there is the current user master list, on the right there is the list on the computer and the user lists on the testers.



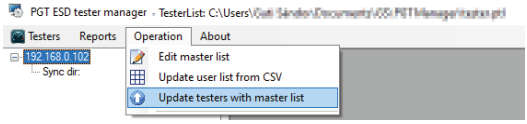


To upgrade the computer master list with differences based on the testers' lists, use the „Upgrade master list with differences" button at the bottom right.

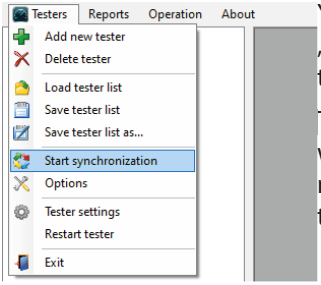
To edit the master list, right-click on the item you want to edit or delete and use the pop-up menu options. Don't forget to save your changes with the „Close with SAVE" button if you want to keep them.

4.2.1.4 Updating user list files on testers

The program can copy the information of the user master list on the computer to each tester. To do this, click on „Update testers with master list" in the main menu „Operation".



4.3 Synchronization



You can use the „Start synchronization" option under „Testers" menu to copy the test data from the testers in the tester list to your computer.

This will not update the user master list. SGT Manager will start downloading new files in parallel threads to make the process as fast as possible. The meaning of the colours in the background of the IP addresses are:

Dark green background: No synchronization has occurred yet during the current program run

Yellow background: Synchronization in progress

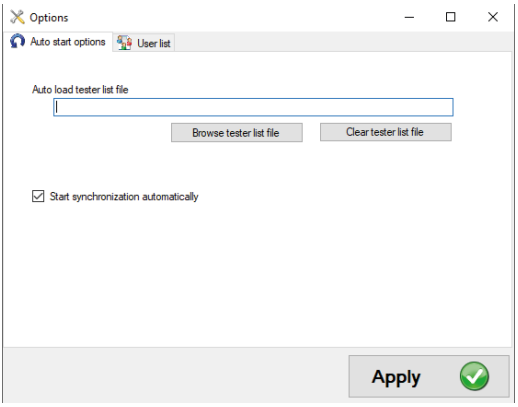
Light green background: Synchronization has been successfully completed, tester name is displayed

Red background: Unsuccessful synchronization

5. Settings

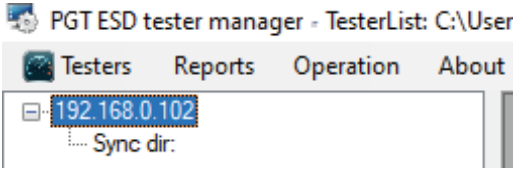
5.1 General settings

If you click on the „Options" submenu item under the „Testers" menu item, a window will appear where you can make settings for the SGT Manager. The first page is „Auto start options". SGT Manager is able to load a tester list automatically after startup. Use the buttons to browse or delete the tester list. If you tick the checkbox, the test results will be synchronized automatically after startup. On the second page you can create or browse a user master list (here in the program: master user list).

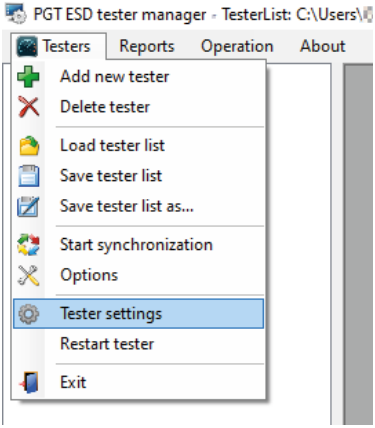


5.2 Changing the tester settings:

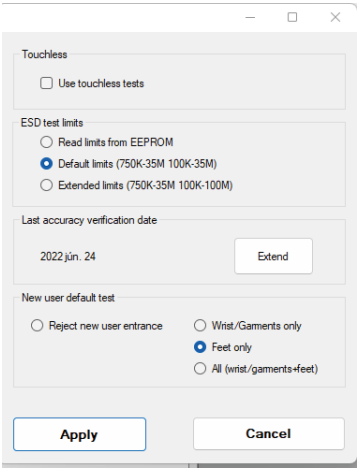
1. Select the tester you want to modify from the list on the left:



2. From the main menu „Testers" select „Tester settings":



The „config change" window that pops up contains the configuration options:



„Touchless": check the box to activate touchless testing. (In this mode, only the footwear system or the footwear system and wrist strap/groundable ESD smock system test type can be used, as well as „VIP" unmeasured entry. Modify the user list accordingly.)

„ESD test limits": the upper resistance limit accepted for measuring the footwear system can be changed here:

- In case of „Read limits from EEPROM/Default limits" it is: 35 MΩ
- In case of „Extended limits" it is: 100 MΩ

„Last accuracy verification date": Possibility to change and view the date of the last calibration verification measurement. The date shown here is correct if the date was updated here on the occasion of the last calibration. Repeat the measurement after one year and always update the date in this window in case of calibration. If the instrument is working correctly, pressing the „Extend" button will change the date to the current calendar day. The date is not automatically updated during calibration.

„New user default test": here you can set the default action for newly added ID cards that are not yet in the user master list.

„Reject new user entrance": if set, the tester will deny entry if unknown RFID cards are used.

„Wrist/garments only": if set, the tester will allow entry after a successful wrist strap / groundable ESD smock system check.

„Feet only": if set, the tester will allow entry after a successful footwear system check.

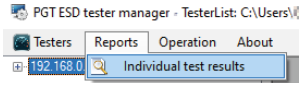
„All (wrist/garments+feet)": if set, the tester will allow entry after successfully checking the footwear system and wrist strap / groundable ESD smock system.

The window allows you to change several settings at the same time. The changes are confirmed by pressing the „Apply" button and cancelled by pressing the „Cancel" button.

IMPORTANT: The test program (or the tester) MUST be restarted after pressing the „Apply" button to validate the changes.

6. Reporting

One of the most important functions of SGT Manager is to collect and use the data files from the testers to generate report. In order to obtain a fresh report, it may be useful to perform a synchronization before reporting. Use the „Individual test results" menu item of the „Reports" main menu item to view report.



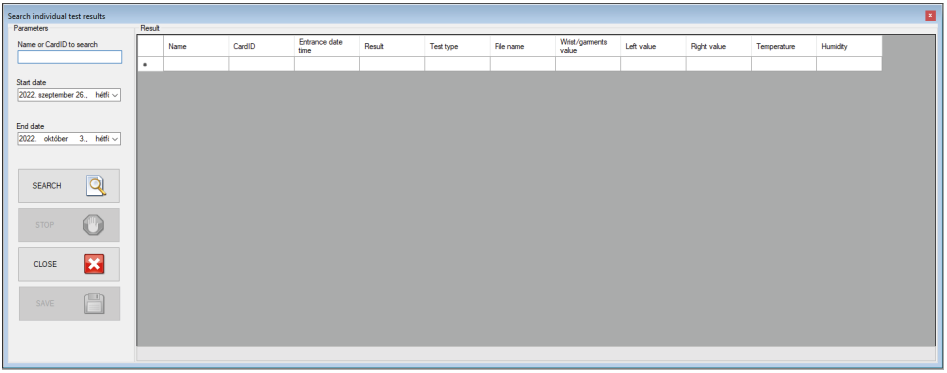
Use the window that appears to search. You can use three fields to narrow down the results:

1. Card number or name

2. Start of the time interval you want to query

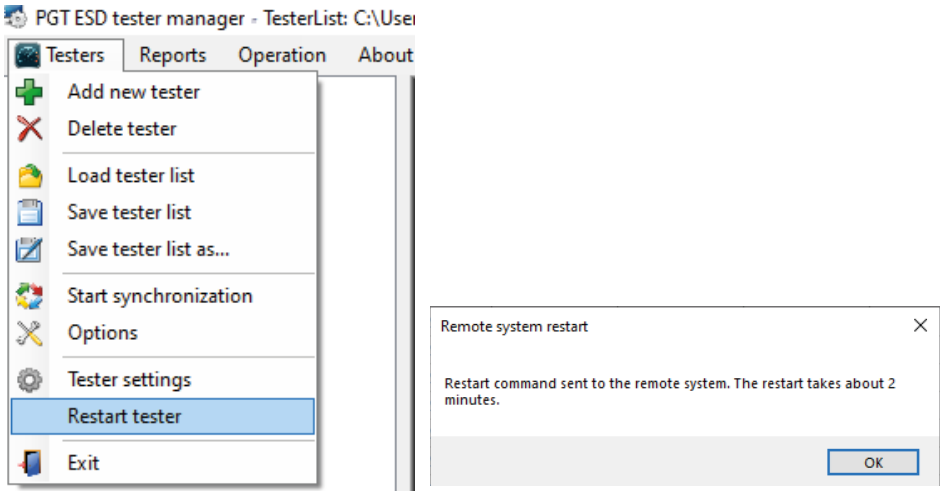
3. End of the time interval you want to query

To start the search, press the „SEARCH" button. The result will be displayed on the right. Use the „SAVE" button to save the result.

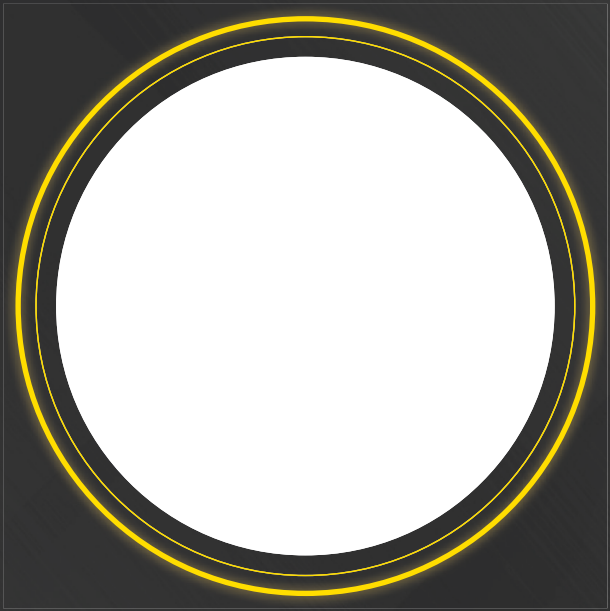


7. Restart the tester

To restart the tester, select „Restart tester" under the main menu item „Testers". Click on „OK" in the „Remote system restart" window.



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