

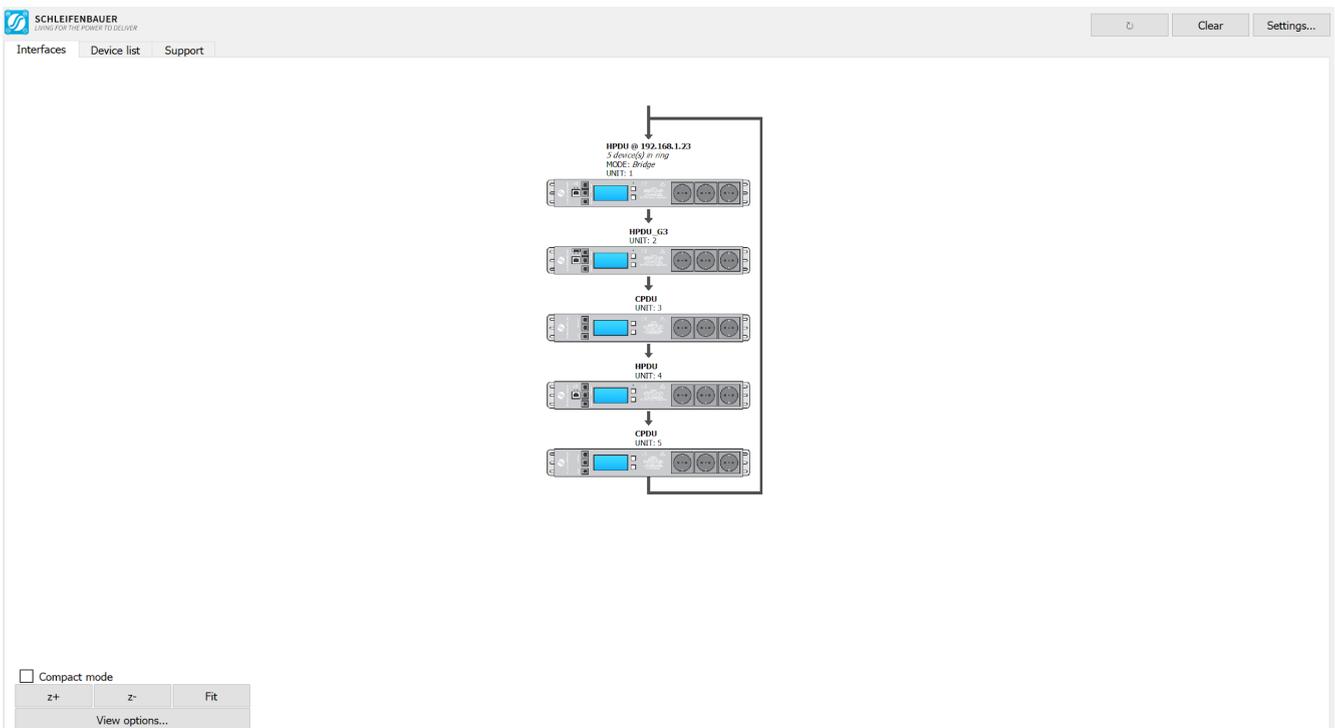


SCHLEIFENBAUER

LIVING FOR THE POWER TO DELIVER

Schleifenbauer SPST User manual

V1.2.0



Augustus, 2021

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In several places popups might appear with useful information.



All intelligent Schleifenbauer devices are embedded devices with the option to update to the latest compatible firmware. The most recent firmware is available in the latest version of SPST or can be downloaded separately. Other firmware versions can be found on our website at the download page.



This manual covers SPST only, manuals for specific Schleifenbauer products can be found on our website. For more PDU or DPM (energy meter) information check their specific manuals.

WHAT IS INCLUDED IN V1.2.0 (CHANGES SINCE V1.1.8)

- Schleifenbauer logo is now set as a general application icon.
- SPST user files directory can be opened in the Settings menu.
- User settings can be exported and imported in the Settings menu.
- “Restore to default” in the Settings menu now produces backup files in the program directory for safety.
- Possibility of creating, saving and using user login presets in the Network Scan menu.
- Deleting or updating presets now requires confirmation so they can't be accidentally deleted.
- The last used register preset is remembered and loaded automatically on start-up.
- Default register presets are reordered and improved.
- Improved unit address renumbering.
- Improved XLSX file validation and error handling.
- Improved scanning time.
- SPDM data model up to v2.66 is included.
- Newest firmware version is included.
- Application locking improvement.
- The user interface has received lots of visual improvements.
- High resolution mode and display scaling options.
- Many other visual and technical improvements/bug fixes to enhance user experience.

PART I: WHAT IS SPST?



SPST stands for "Schleifenbauer Products Service Tool". This tool aims to aid customers in analyzing and maintaining their network of Schleifenbauer PDUs and DPM-energy meters. It does so by offering distinctive features:



Users are able to "quick scan" the status of the data bus.

=> See part II: [Interfaces](#)



Users can upgrade or downgrade firmware in a very easy and simple way.

=> See part III: [Device list](#)



Users can remotely mass configure or read all connected data bus devices.

=> See part III: [Device list](#)



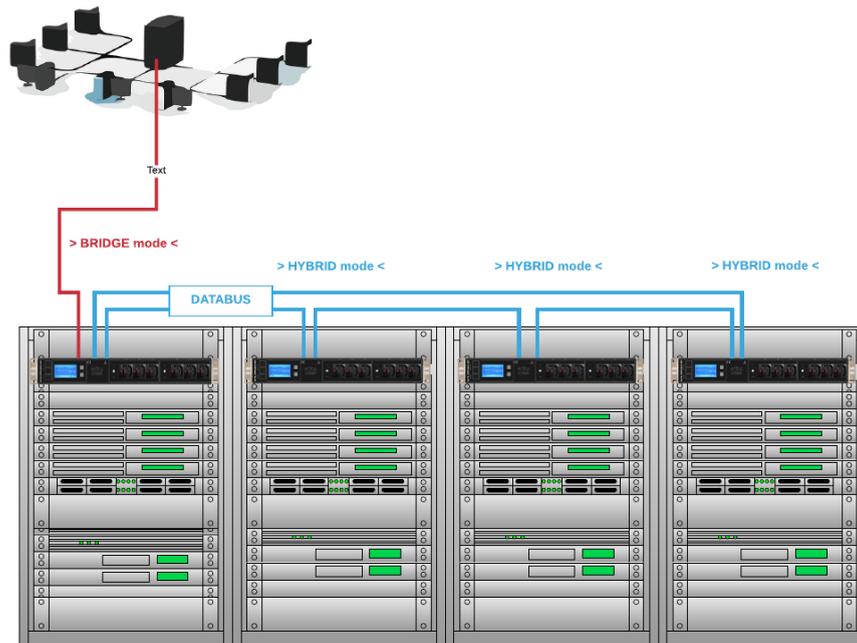
SPST will decrease problem solving lead time.

=> See part IV: [Support](#)

WHAT IS A SCHLEIFENBAUER DATA BUS

It is possible to daisy chain multiple Schleifenbauer devices using the data bus. One of these devices must be connected to the network and set to "bridge mode" to make it a bus master. We call this the "master device". This master device is the bridge from the data bus to the network. All other devices must be set to "hybrid" for them to act as secondary devices. So the master device acts as the communication bridge to all other devices. One IP-address allows users to communicate with and

manage up to 50 Schleifenbauer devices. The use of additional devices is optional but will significantly limit communication speed across the data bus. The data bus has standard CAT5 or 6-cables, so no special cables are required. The image below shows the master device connected to a local area network (red line) while all other devices are daisy chained through the data bus (blue line). The image shows the data traffic over IP and the data bus.



In the user manuals of the PDU and DPM-energy meters there are several examples of data busses and their advantages. You can find these manuals on our website: www.schleifenbauer.eu. All Schleifenbauer Product devices can be daisy chained to form a data bus ring. The devices are:

Generation	Device	Bridged to LAN through	Remark
G1	Classic PDU DPM27	Schleifenbauer Gateway	Devices from the first generation do not have an ethernet port. They are equipped with two data bus ports.
G2	PDU DPM3	One master device - a PDU or DPM3 - in "BRIDGE" mode others in "hybrid" mode	The second generation devices are equipped with ethernet AND two data bus ports.
G3	PDU G3 DPM27/E	One master device - a PDU or DPM27/E - in "BRIDGE" mode, others in "hybrid" mode	The third generation devices are equipped with ethernet, two data bus ports and an USB-port.

OVERVIEW OF SCHLEIFENBAUER DEVICES AND THEIR FIRMWARE VERSIONS

	<i>Device sort</i>	<i>Firmware version</i>	<i>Status device and firmware development</i>
Generation 1	Gateway	SPGWupdater_xxx_254	EOL: This device is not for sale anymore Firmware development has stopped.
	Classic PDU	FW1.50	EOL: This device is not for sale anymore Firmware development has stopped.
	DPM27	FW1.50	EOL: This device is not for sale anymore Firmware development has stopped.

Generation 2	PDU	FW2.xx	This device is replaced by the PDU G3 which is equipped with an additional USB-port. Firmware development is ongoing and based on data model SPDM2xx.
	DPM3	FW2.xx	EOL: This device is not for sale anymore but firmware development is ongoing and based on data model SPDM2xx.

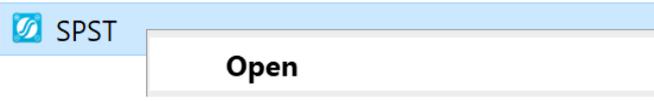
Generation 3	PDU G3	FW2.xx	Device is available and firmware development is ongoing and based on data model SPDM2xx
	DPM27/E	FW2.xx	EOL: This device is not for sale anymore but firmware development is ongoing and based on data model SPDM2xx.

- EOL = End of life.



The latest firmware version(s) are integrated in the SPST application. Both firmware files and the SPST-tool can be downloaded from the Schleifenbauer website.

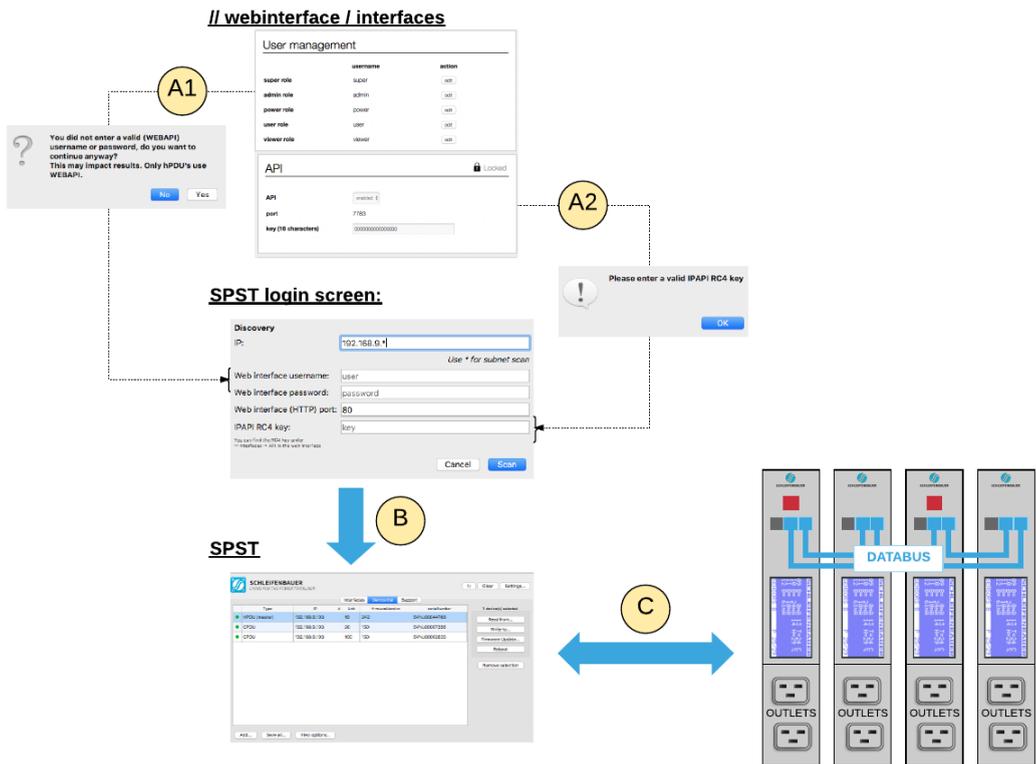
HOW TO INSTALL THE SPST TOOL

 <p>An update for SPST is available!</p> <p>You are running version 1.1.7-4-g9464f26, the latest version is 1.1.8-WINDOWS. Visit documentation.schleifenbauer.eu/SPST to download the latest version.</p> <p>OK</p>	<p>Customers will be notified of an available update when running an older version of SPST.</p> <p>Please click on the link that is provided in the notification to download the latest version from the Schleifenbauer website.</p>
 <p> SPST-v1.1.8-LINUX.zip</p> <p> SPST-v1.1.8-MAC.zip</p> <p> SPST-v1.1.8-WINDOWS.zip</p>	<p>Download the appropriate SPST application for the operating system you are using.</p> <p>When downloading is finished, unzip the file.</p>
 <p>SPST</p> <p>Open</p>	<p>When unzipped, right click on the  SPST application and run it.</p> <p><i>Note: In Windows the file can be unzipped directly!</i></p>
 <p>Uw pc wordt beschermd</p> <p>Met Microsoft Defender SmartScreen is voorkomen dat een onbekende app is gestart. Het uitvoeren van deze app kan een risico voor uw pc vormen.</p> <p>App: SPST.exe Uitgever: Onbekende uitgever</p> <p>Toch uitvoeren Niet uitvoeren</p>	<p>When SPST is started for the first time, Windows users may encounter a SmartScreen notification in the same language that their operating system is set to.</p> <p>Users may encounter similar “risk” or “access” notifications on other operating systems in their system language.</p>
 <p>SPST</p> <p>SCHLEIFENBAUER LIVING FOR THE POWER TO DELIVER</p> <p>Interfacs Device list Support</p> <p>Discover...</p>	<p>If the main screen appears, SPST is installed correctly and ready to use.</p>

Note: for uninstalling SPST go to the “[Support](#)” section of this manual.

HOW TO LOG IN

SPST provides an easy service for devices that connect to the Schleifenbauer data bus. Users can connect to the data bus by performing a login on the "bridged" device, also known as the "bus master" (PDU, DPM3 or DPM27/E). There are five data fields required for SPST to connect to the data bus. The first one being the IP address range (for subnet scan) or the IP address. The username and password of the "bridged" device are up next. These are the same passwords that are used to access the web interface. Also an HTTP port (80 is the default, 443 for HTTPS) and the IPAPI RC4 key are required. The IPAPI RC4 key is used to provide a secure communication channel between the application and the PDU connected to the network.



A1 =	Username, password and port of the "bridged" device are required to access the data bus on an IP address. <i>In the Administrator part of the device manual you can find a description of login profiles, usernames and passwords.</i>
A2 =	An IPAPI RC4 key is required for secure data bus communication
B =	If A1 and A2 input is valid, SPST connects to the data bus. If the user has specified a range of IP addresses a subnet scan will search for "bridged" devices on the data bus. This scan takes some time to complete.
C =	Read/write operations to the data bus are now possible. There's also the possibility of (mass) updating the firmware of the Schleifenbauer devices in the data bus.

<p>Warning: default credentials are used, this is a security risk</p>	<p>After the installation of Schleifenbauer products, the default settings regarding user profiles should have been changed by your administrator. The warning pop up notifies users that factory settings are still unchanged: please contact your administrator to correct this issue.</p>
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Discovery

Login preset: Save Remove

IP:
*Use * or CIDR for subnet: 192.168.1.* or 192.168.1.0/24*

Web interface username:

Web interface password:

Web interface (HTTP) port:

IPAPI RC4 key:
You can find the RC4 key under
 = interfaces → API in the web interface

Cancel Scan

The values on the login screen must be completed before the full functionality of SPST can be accessed.

A user can login to a single device or to the main unit of a ring of devices. It is also possible to perform a scan on a certain subnet. SPST then searches for all Schleifenbauer devices on that subnet.

A user can choose to log into the devices with the WEBAPI protocol or via IPAPI, but the default is to use both. In the login screen, the credentials can be entered.

To organise the management of devices in rooms, a user can save, modify and delete login presets. SPST validates the input at the moment the user initiates the scan.

SETTINGS

We advise to leave all settings on their default value if there are no issues during usage.

Settings

Protocol fail tolerance:

IPAPI connection timeout (s):

IPAPI yield time (s):

WEBAPI connection timeout (s):

Databus scan response timeout (s):

Graph auto compact mode #devices:

Graph compact mode min. group size:

Cache expire (s):

Maximum number of threads:

Clear all cached device data:

Local SPST log file:

Extended log: Enabled

Local SPST config file:

Display scaling (requires restart):

High resolution mode (req. restart): Enabled

Import settings Export settings

User directory

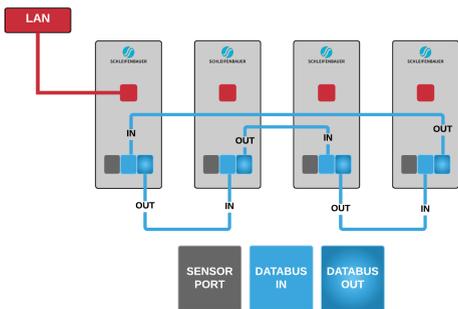
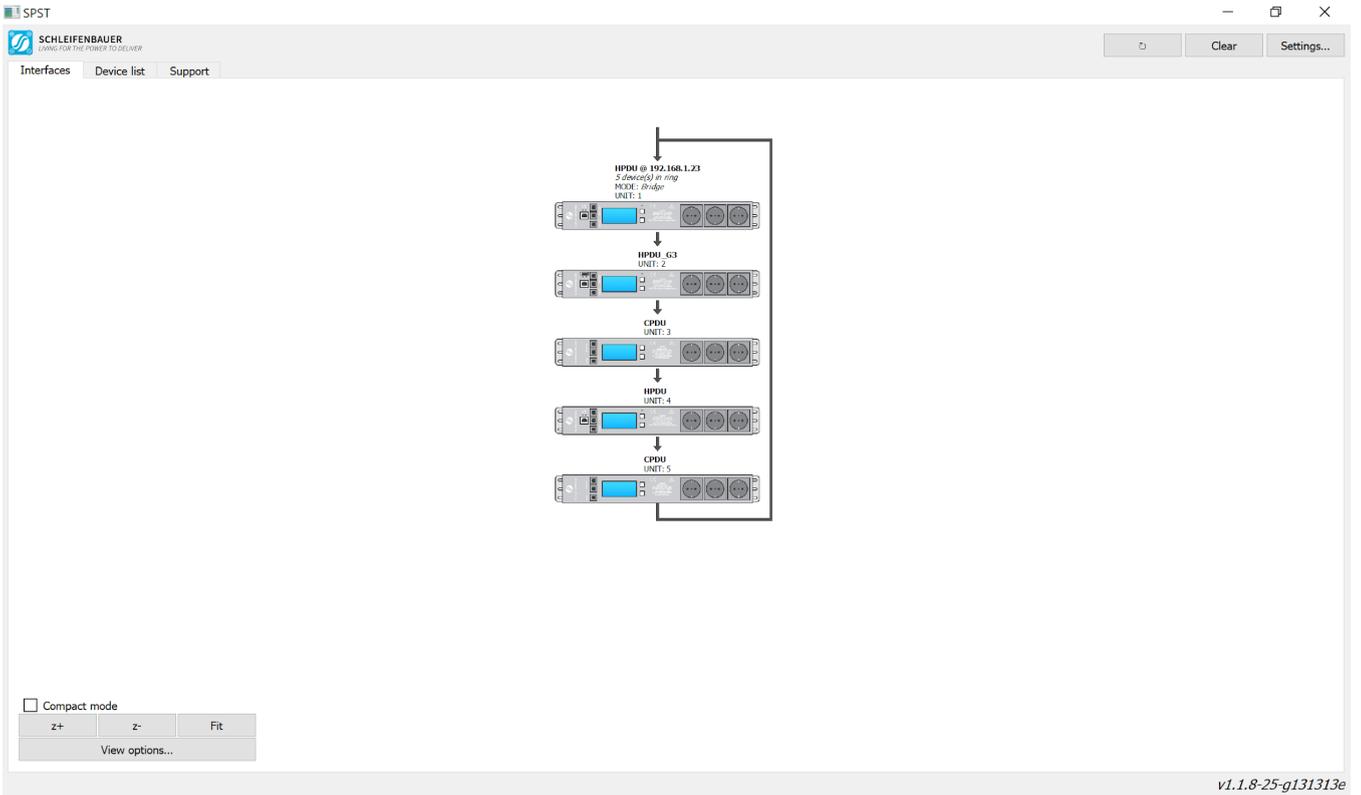
Save Cancel

Name	Purpose
Protocol fail tolerance	Protocol fail tolerance.
IPAPI connection timeout	The amount of time in seconds that is granted to connect to the IPAPI interface before timeout.
IPAPI yield time	IPAPI yield time.
WEBAPI connection timeout	The amount of time in seconds that is granted to connect to the WEBAPI interface before timeout.
Databus scan response timeout	The amount of time in seconds that a data bus scan is granted to reach completion before timeout.
Graph auto compact mode	Compacts the graph automatically to a number of devices.
Graph compact mode min. group size	The minimal group size of the graph compact mode.
Cache expire	This value dictates the amount of time in seconds which the current cache is marked as valid.
Maximum number of threads	The maximum number of threads the application is allowed to have running during usage.
Clear all cached device data	Clears the cache of all device data within the program.
Local SPST log file	Opens local SPST log file.
Extended log	Enables extended logging.
Local SPST config file	This restores all settings in SPST to default values except remembered login info. This also means user presets will be deleted. A backup of current settings is made in the user directory before restoring defaults.
Display scaling	This slider adjusts display font scaling for different displays with high DPI. Moving the slider to the right increases font scaling. Requires restart.
High resolution mode	This mode sets up the application for screens with very high resolutions. Requires restart.
Open user directory	Opens the user directory where all user related SPST files are stored.
Export settings	Exports current settings and presets to a user selected backup folder containing the date and time during the export. Do not alter exported files(names) and folders, as they'll possibly not pass the validity check during the import process.
Import settings	Imports current settings and presets from a user selected backup folder. As the application will exit, it requires a manual restart for the settings to be restored.

PART II - INTERFACES

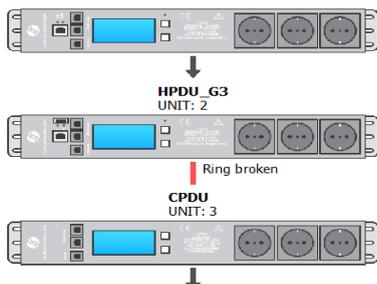


The Interfaces tab provides graphical overview of data busses



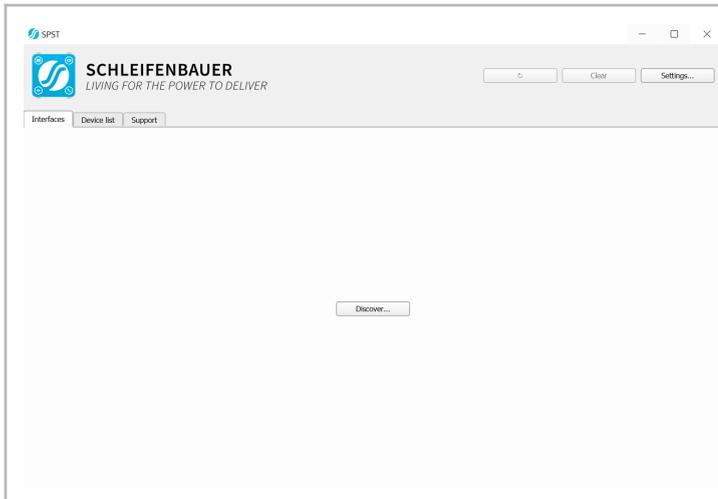
We advise to connect Schleifenbauer products to the data bus as the connection image shows on the left. The graphical overview in SPST represents the real life situation of how devices are connected to the data bus. This situation is updated constantly.

There are three black communication ports. One is marked as sensorport, the other two as data bus ports (in and out). The left data bus port is the “incoming” data bus port. The right data bus port is “outgoing”. This is especially important for devices in “bridge” mode; a MUST HAVE for devices in bridge mode and NICE TO HAVE for devices in hybrid mode.

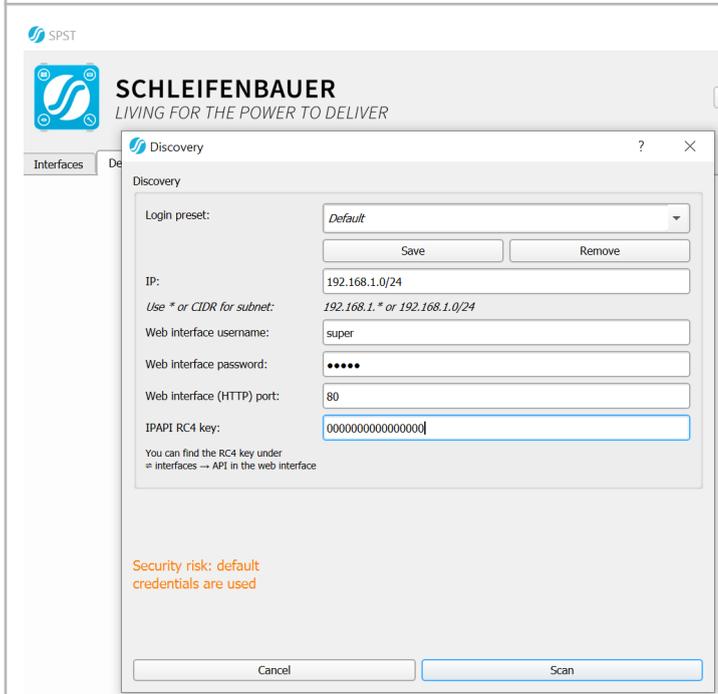


When a ring is open because of a faulty CAT5 UTP cable or because of a connection deviation from the connection image above that prevents the ring from being closed, SPST will show “ring broken” in it’s “Interface” section, as can be seen in the left image. The new locate functionality allows users to blink the display of the PDU where the ring is broken.

HOW TO ANALYZE THE DATA BUS?



When the SPST is loaded, users may start using SPST by selecting the "Discover" button.



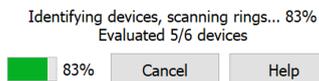
For the discovery of connected Schleifenbauer products, access to the Schleifenbauer data bus and the "bridged" device is required.

 This is described step by step in chapter "[How to log in?](#)".

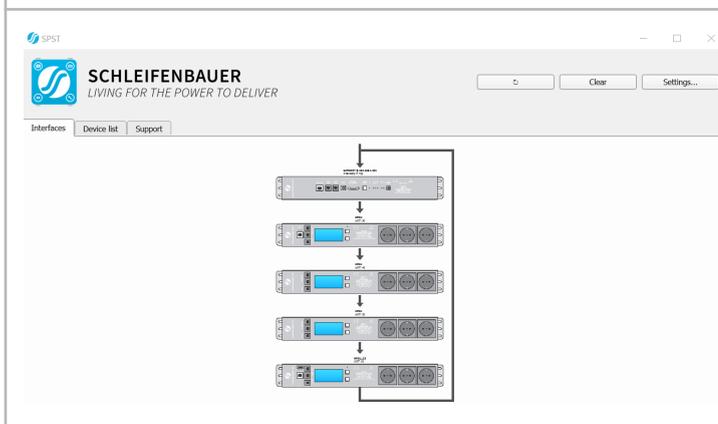
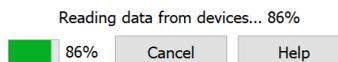
Step one: subnet scan progress.



Step two: device identification.

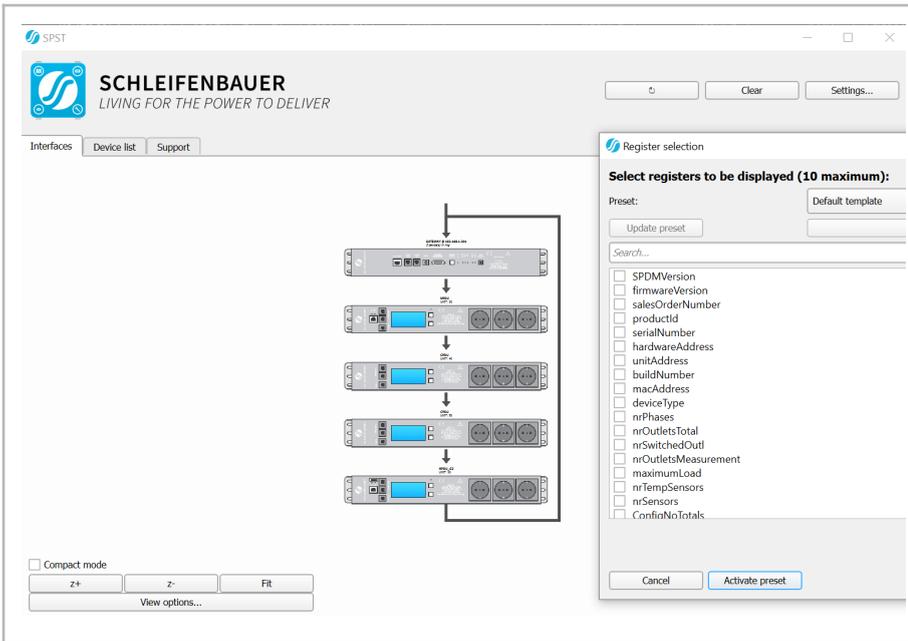


Step three: read data from devices.



When all devices are scanned, a visual overview of the attached data bus rings is shown.

HOW TO PERSONALIZE THE NETWORK OVERVIEW



The screenshot shows the SPST web interface with the 'Device list' tab selected. A 'Register selection' dialog box is open, titled 'Register selection' and 'Select registers to be displayed (10 maximum):'. The dialog has a search bar and a list of registers with checkboxes. The registers listed are: SPDMVersion, firmwareVersion, salesOrderNumber, productId, serialNumber, hardwareAddress, unitAddress, buildNumber, macAddress, deviceType, nrPhases, nrOutletsTotal, nrSwitchedOutl, nrOutletsMeasurement, maximumLoad, nrTempSensors, nrSensors, and ConfNoTotals. The dialog also includes 'Preset' and 'Default template' buttons, and 'Cancel' and 'Activate preset' buttons at the bottom.

If you want specific information shown in your network overview, please select "view options". A pop-up named "read" now shows a list of register entries that the user can choose to display. Select "Apply" and the network overview will be renewed. Users can also add, modify and delete their own presets. The last used preset is saved.

 The maximum number of selectable register entries is ten.

PART III - DEVICE LIST



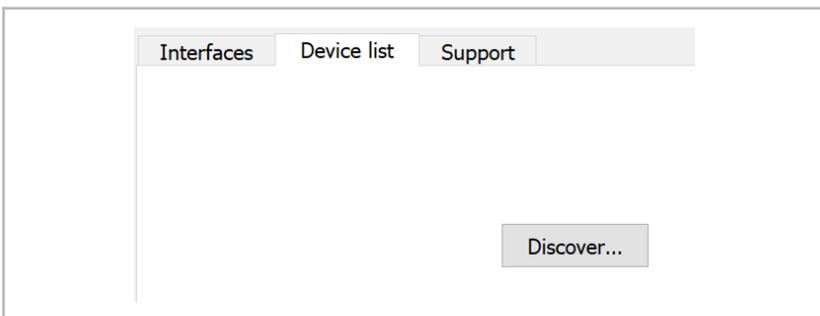
In section “Device list” are tools to update or mass configure data busses

HOW TO UPDATE FIRMWARE

⇒ Step 1: use the correct passwords and IPAPI RC4-key

SPST communicates with a bridged device and the data bus using two separate protocols: IPAPI and WEBAPI (see [chapter “How to log in”](#)). The administrator should have changed factory default settings after installation of the devices. So if access to the IPAPI RC4 key or passwords are restricted, please contact your administrator.

⇒ Step 2: check the device list



The screenshot shows the SPST web interface with the 'Device list' tab selected. A 'Discover...' button is visible in the center of the page.

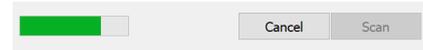
Select the tab “Device list” and click on “Discover...”

For the discovery of connected Schleifenbauer products, access to the Schleifenbauer data bus and the "bridged" device is required.



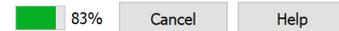
This is described step by step in chapter "[How to log in?](#)"

Step one: subnet scan progress.



Step two: device identification.

Identifying devices, scanning rings... 83%
Evaluated 5/6 devices



Step three: read data from devices.

Reading data from devices... 86%



Type	IP	Unit	firmwareVersion	serialNumber
PDU (master)	192.168.1.107	1111	262	SVNL00056484
PDU	192.168.1.107	30	258	SVNL00044768
Device online A firmware update is available!	192.168.1.107	40	150	SVNL00002835
	192.168.1.107	50	150	SVNL00007398
HPDU_G3	192.168.1.107	20	262	50

All connected devices are listed in a table. If the latest version of SPST from the Schleifenbauer website is used, users can immediately determine whether all connected devices are running on the latest firmware or not.

In the upper left column of the device interface there is a green, orange or red status indicator which indicates the status of a device:

GREEN = device is online

ORANGE = firmware update available

RED = device is offline

Hovering over the status indicator triggers a pop-up:

Type	IP
PDU (master)	192.168.1.107
Device online A firmware update is available!	192.168.1.107
CPDU	192.168.1.107

In the hint window users can verify that SPST is communicating with the PDU using both IPAPI and WEBAPI. This is specifically important when using the mass configuration functionality of SPST.

⇒ Step 3: start updating



There are three kinds of firmware currently:

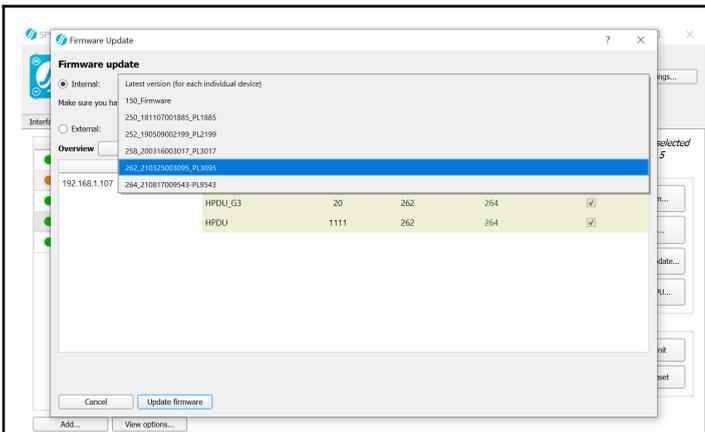
- 1.xx, which is used for the Classic PDU which has no ethernet port
 - 2.xx, which has an Ethernet port. For updating to the latest firmware (newer than 2.58) users need to update to 2.58 first. SPST will notify the user if this step is required.
- Updating 1.xx and 2.xx firmware devices at once is not possible. If there are rings with both generations of firmware, users have to perform the update process twice.



The most recent firmware versions are included in the SPST-tool. So, it is preferable to always download the latest SPST-tool from www.schleifenbauer.eu.



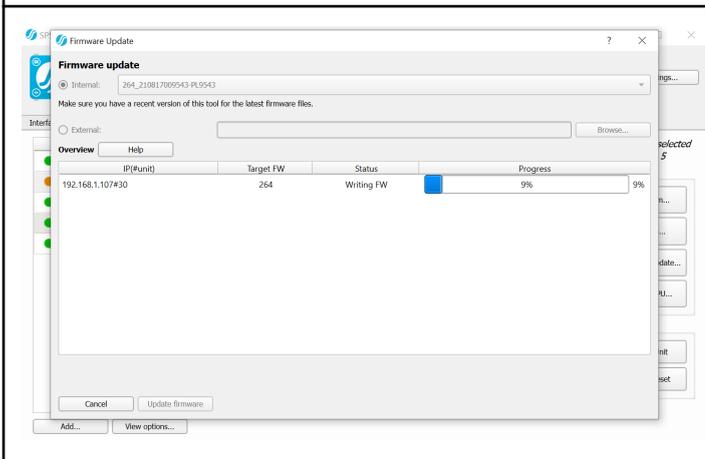
Firmware updating takes a while to complete. Updating the firmware will NOT interrupt power distribution or switch outlets.



There are two possibilities for selecting a firmware-file to update a Schleifenbauer device with:

- Internal (use the drop down menu)
- External (select a downloaded file)

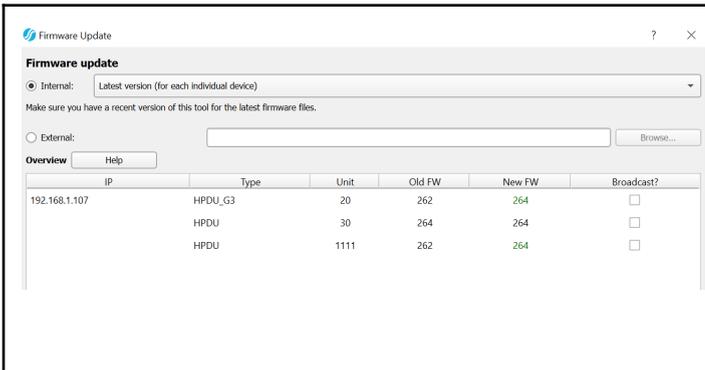
SPST gives users the possibility to perform a “deep update”. The firmware packages are broadcasted three times over the data bus. This is useful if some devices will not update. This is mostly because big data busses with over 50 devices daisy chained can in the worst case suffer from packet loss, especially when lots of classic PDUs are combined with newer generation PDUs. This feature gives better update results on bigger data busses. When all classic PDUs are placed at the end of the ring there is no need to use the “deep update” functionality.



In the "progress" bar users can monitor the update process. When done, click "close".

Status	Progress
Success	100%

Please check if all devices are updated to their most recent firmware (see step 1). This can be determined by checking if all status indicators are green.

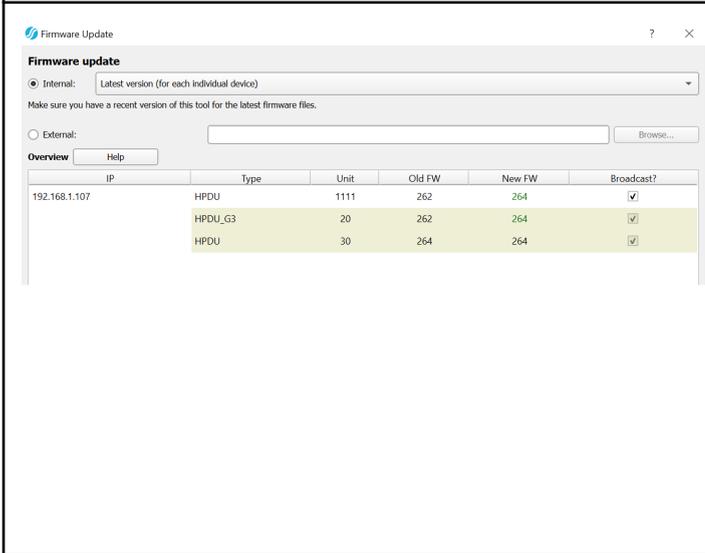


Broadcast?

| |

Firmware update without broadcast:
 Only one selected device will be updated.

- Only possible with the master device in a data bus that is in "bridge" mode.
- Faster and more reliable method to update a single PDU.



Broadcast?

Firmware update with broadcast:
 All Schleifenbauer devices of a similar generation in the ring will be updated. Please check the "broadcast" box to include secondary "hybrid" devices in the firmware update. Massive amounts of data is being sent over the data bus so transmission will be slower when updating multiple Schleifenbauer products at once.

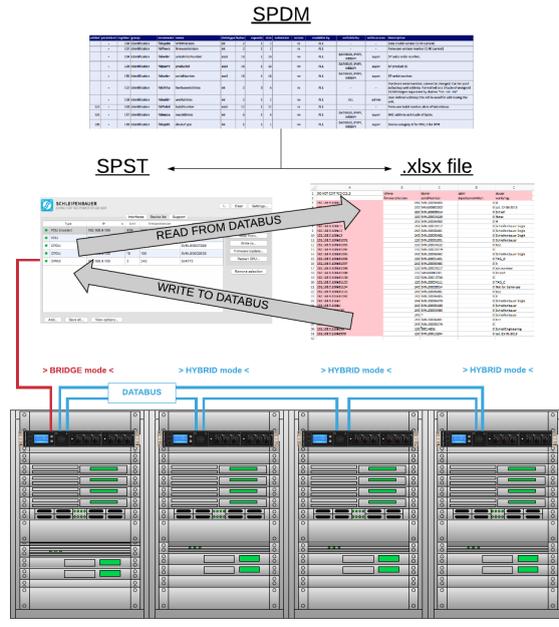
Note: The image shows that yellow marked devices are included in the firmware update.

SPDM: SCHLEIFENBAUER PRODUCTS DATA MODEL

The Schleifenbauer Products Data Model (SPDM) describes information about the internal register structure of Schleifenbauer products. Users may read which registers are readable and/or writable, depending on which interface and which role is granted write access. The SPDM information can be downloaded from www.schleifenbauer.eu

THE MASS CONFIGURATION-PROCESS

Mass configuration can be performed by using the "Read from..." and "Write to..." buttons. SPST reads information from the devices through the data bus and puts it into an XLSX-file. This filetype can be opened with software like Microsoft Office, Google Spreadsheets or OpenOffice for example. When changes are made to the XLSX-file, save the file. Click "Write to..." in SPST and select the modified XLSX-file so it can be given the command to write the updated XLSX-file to the devices in the data bus. The image below shows a schematic overview of the procedure that is required to mass configure Schleifenbauer devices.



Interfaces Device list Support

Type	IP	Unit	firmwareVersion	serialNumber
<input checked="" type="checkbox"/> PDU (master)	192.168.1.107	1111	262	SVNL000956484
<input checked="" type="checkbox"/> PDU	192.168.1.107	30	264	SVNL00044768
<input checked="" type="checkbox"/> CPDU	192.168.1.107	40	150	SVNL00002835
<input checked="" type="checkbox"/> CPDU	192.168.1.107	50	150	SVNL00007398
<input checked="" type="checkbox"/> HPDU_G3	192.168.1.107	20	262	50

3 device(s) selected
Total: 5

Read from...
Write to...
Firmware Update...
Restart CPU...

Select all the devices on the data bus that need to be mass configured by selecting one device in the table. Then hold Shift or Ctrl and click the left mouse button to add additional devices to the selection.

3 device(s) selected
Total: 5

Read from...
Write to...
Firmware Update...
Restart CPU...

If all devices that need to be configured are selected, click on the "Read from..." button in the right menu.

Read to file

Select registers to be read from 3 device(s).

Preset: Unit Identification

Update preset Delete preset New preset...

Search...

- SPDMVersion
- firmwareVersion
- salesOrderNumber
- productId
- serialNumber
- hardwareAddress
- unitAddress
- buildNumber
- macAddress
- deviceType
- nrPhases
- nrOutletsTotal
- nrSwitchedOutl
- nrOutletsMeasurement
- maximumLoad
- nrTempSensors
- nrSensors
- ConfigNoTotals

Cancel Read

Users may select a preset of registers, but can also create their custom presets by checking or unchecking register boxes.

1. Users can custom select registers.
2. Users can use (or create) presets.
3. Users can update or delete their custom presets (after confirmation).

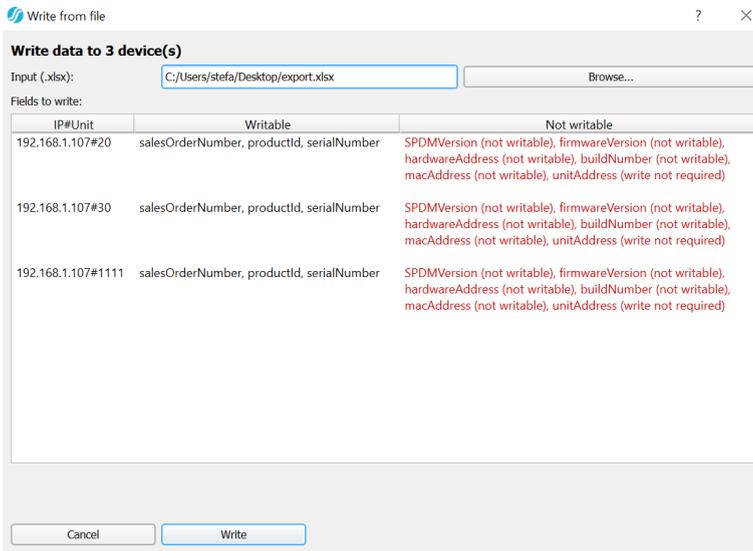
Click "read" when ready and save the XLSX-file. The last user preset is remembered and loaded automatically on start-up.

Users can make their own presets by using the "New preset..." button.

	A	B	C	D	E	F
1	DO NOT EDIT RED CELLS	cfnrph	cfnrno	cfnrso	cfnrmo	cfamps
2		nrPhases	nrOutletsTotal	nrSwitchedOutl	nrOutletsMeasurement	maximumLoad
3	192.168.1.23#1	1	12	12	12	16
4	192.168.1.23#2	1	9	9	9	32
5	192.168.1.23#3	1	1	0	0	16
6	192.168.1.23#5	1	9	9	9	1

Open the XLSX-file with your editor program of choice and change values. When ready, save the file (in XLSX-format).

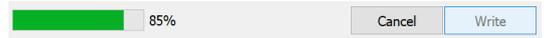
Note: Do not edit the red cells, SPST needs this information to be unaltered when the file is transferred back to the PDU.



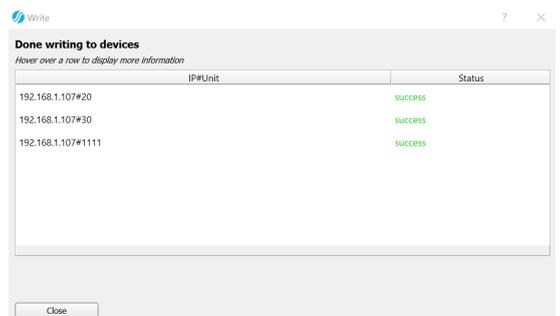
Select **all the devices** that need to be configured. Click on the “Write to..” button, select the XLSX-file using the “Browse..” button and click “Write”. In the “write” screen you can check the pending write operations:

1. The IP address (data bus ring) that will be written to.
2. Which unit addresses will be written to.
3. Which registers will be changed (these are highlighted black).
4. Fields that are present in the XLSX-file and highlighted red should not be changed.

If all options are set correctly, click on the “Write” button to start the write process.



As shown in the image above a progress bar of the write process will appear. When this is finished, SPST shows the user a summary of the write process as shown in the image below.



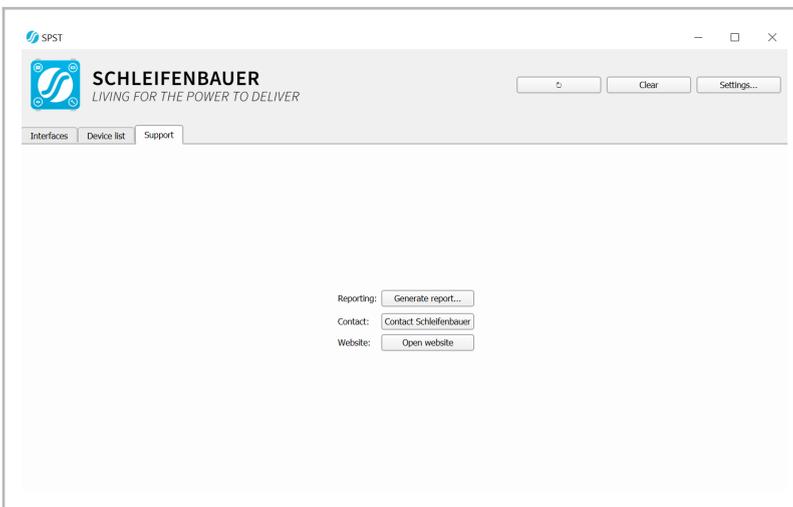
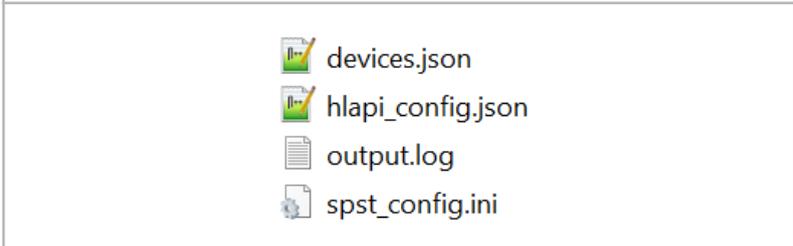
PART IV - SUPPORT

Interfaces Device list Support

In the tab “Support” are tools for problem solving

HOW TO GENERATE A SUPPORT-FILE

Support files are generated by SPST for providing support and problem solving capabilities to you and your Schleifenbauer product administrator. If you encounter any problems, please send a support file to your administrator for examination of the problem.

	<p>When a device or several devices are selected, click on the "Generate report..." button to export a support file.</p>
	<p>Enter a filename and click "Save". The language of this menu is the same as the operating system language installed.</p>
	<p>The ZIP-file includes these files.</p>

The administrator or the Schleifenbauer-support team can analyse support files in order to analyse a problem and define a solution. The "Contact Schleifenbauer" button will open an email screen in which users can attach the ZIP-file. When sent, a “case” will be created in the Schleifenbauer support system (as part of the Quality Management System). If the case is created users will receive an email with a unique case number. All future correspondence regarding this case contains that specific case number.

HOW TO UNINSTALL SPST?

Mac OS

- Delete downloaded SPST.app.
- Delete SPST local data at: "~/Library/Application Support/SPST".

Windows

- Delete downloaded SPST.exe.
- Delete SPST local data at: "C:\Users\username\AppData\Local\Schleifenbauer".

Linux

- Delete downloaded SPST folder.
- Delete SPST local data at: "~/.local/share/SPST".