



# **WELDCUBE PREMIUM**

## **RELEASE 2.2**

**RELEASE DESCRIPTION**

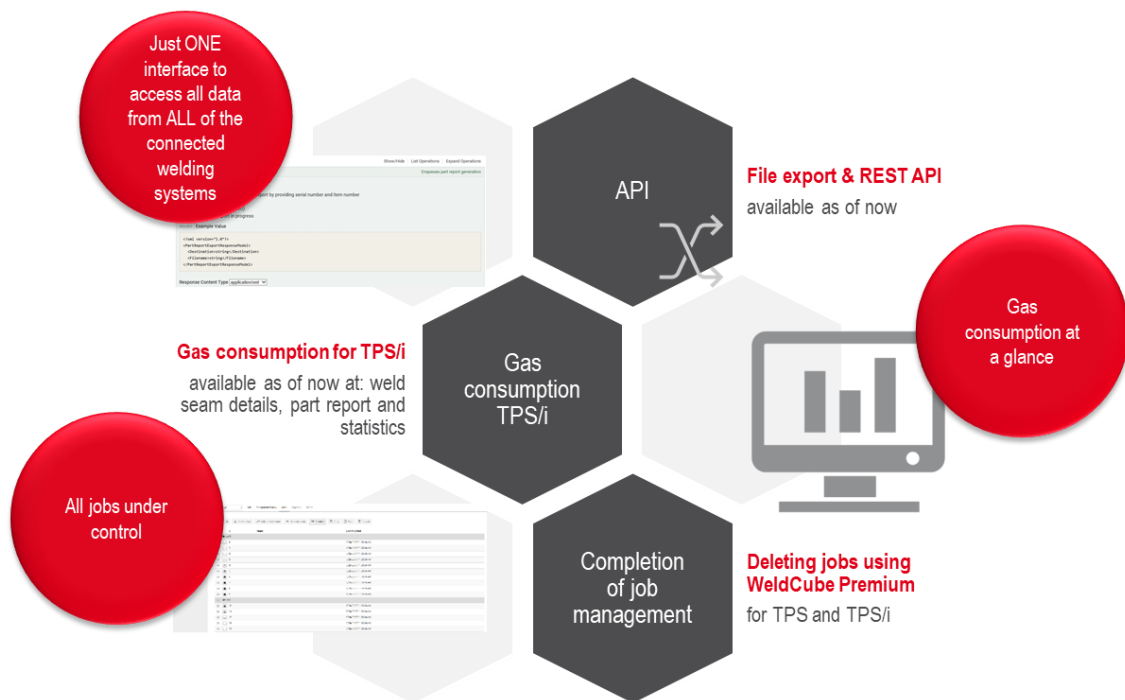
# TABLE OF CONTENTS

<b>1</b>	<b>Overview: new functions</b> .....	<b>3</b>
<b>2</b>	<b>General</b> .....	<b>4</b>
2.1	TPS device backup & restore .....	4
2.1.1	Backup .....	4
2.1.2	Restore .....	5
2.1.3	General information on backup / restore .....	6
2.2	Logbook entry for user login / logout at the welding device (TPS/i) .....	6
2.3	Roll-out of time server for Delta Spot.....	7
2.4	Shutdown function .....	8
<b>3</b>	<b>Set values</b> .....	<b>9</b>
3.1	Centrally deleting jobs of TPS and TPS/i using WeldCube Premium .....	9
<b>4</b>	<b>Actual values</b> .....	<b>11</b>
4.1	Gas consumption per weld now also for TPS/i.....	11
4.1.1	Consumption documentation & visualization per weld seam .....	11
4.1.2	PDF report .....	11
4.1.3	Statistics.....	11
4.1.4	Gross gas consumption per weld (TPS/i) .....	11
4.2	Higher sampling rate for spot welds available as of now.....	12
<b>5</b>	<b>Data interface / API</b> .....	<b>13</b>
5.1	XML & JSON as new formats for file export .....	13
5.2	REST-API .....	14
5.2.1	Welding devices and device data .....	14
5.2.2	List of all jobs per welding device .....	14
5.2.3	Job details per Job.....	15
5.2.4	List of all welds.....	15
5.2.5	Weld details .....	15
5.2.6	Versioning .....	16
5.2.7	API in general .....	16
5.2.8	Swagger documentation for REST API .....	16
5.2.9	WeldCube Premium REST-API – customer benefits .....	17
<b>6</b>	<b>Note: WeldCube Premium &amp; MCU exchange TPS/i</b> .....	<b>18</b>

# 1 OVERVIEW: NEW FUNCTIONS

Release 2.2 provides several news and improvements for the WeldCube Premium application.

**TPS/i firmware version 1.8.6** is required for using release 2.2 together with TPS/i. The following chart shows the most important new possibilities:



## Attention:

- / Gas consumption for TPS/i requires TPS/i firmware version 2.0.
- / TPS/i firmware versions 1.9 and 2.0 fix many troubles with data communication between TPS/i and WeldCube Premium. Thus, we highly recommend updating TPS/i firmware to version 2.0.

The following list provides an overview of all new functions with release 2.2:

- / General
  - / TPS device backup & restore
  - / Logbook entry for user login / logout at the welding device (TPS/i)
  - / Roll-out of time server for Delta Spot
  - / Shutdown function
- / Set values
  - / Centrally deleting jobs of TPS and TPS/i using WeldCube Premium
- / Actual values
  - / Gas consumption (gross & net) per weld now also for TPS/i
  - / Higher sampling rate for spot welds available as of now
- / Data interface / API
  - / New data types available for file export: XML & JSON
  - / REST-API with many possibilities

## 2 GENERAL

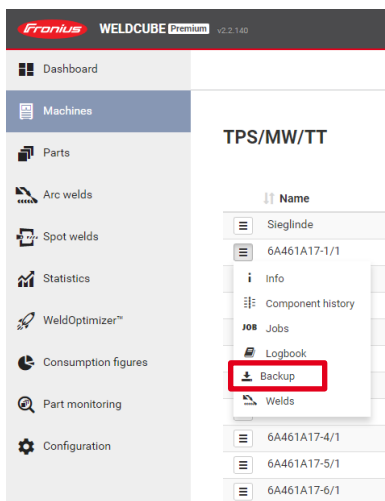
### 2.1 TPS device backup & restore

It is now possible to create a full backup of all data at UST and RCU of a TPS manually and to restore this backup manually as well.

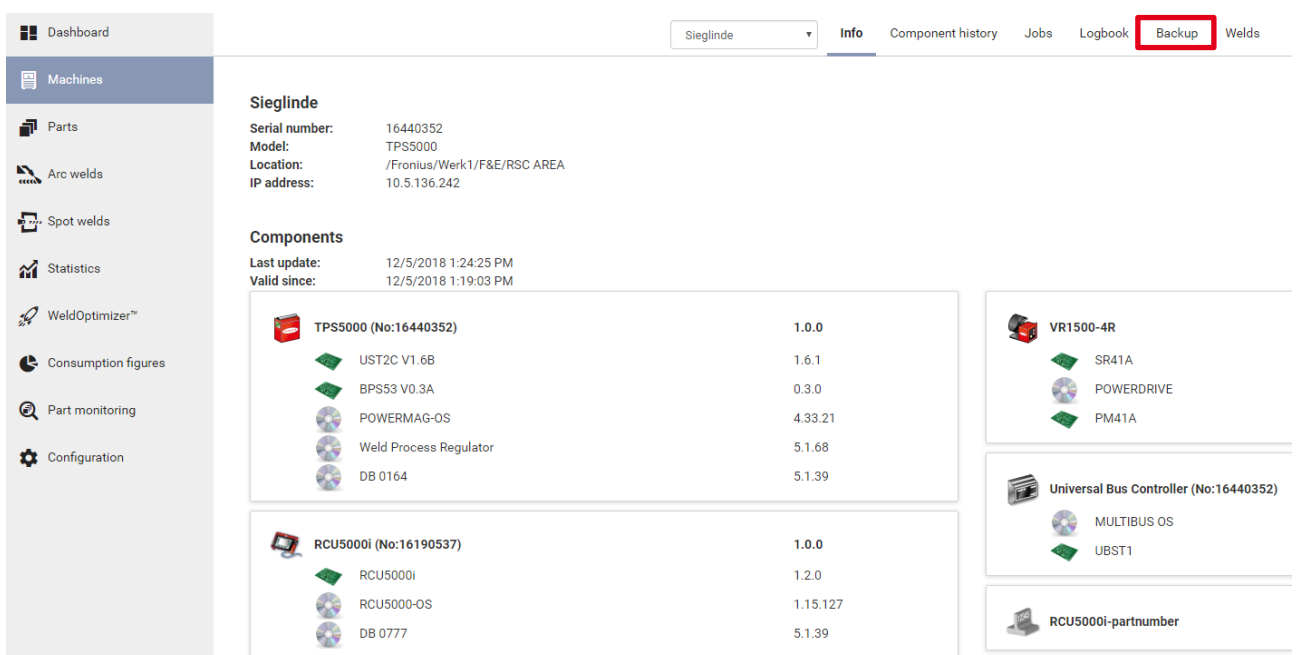
#### 2.1.1 Backup

In order to use this function there is a new menu item called “backup” available at the machine menu of WeldCube Premium.

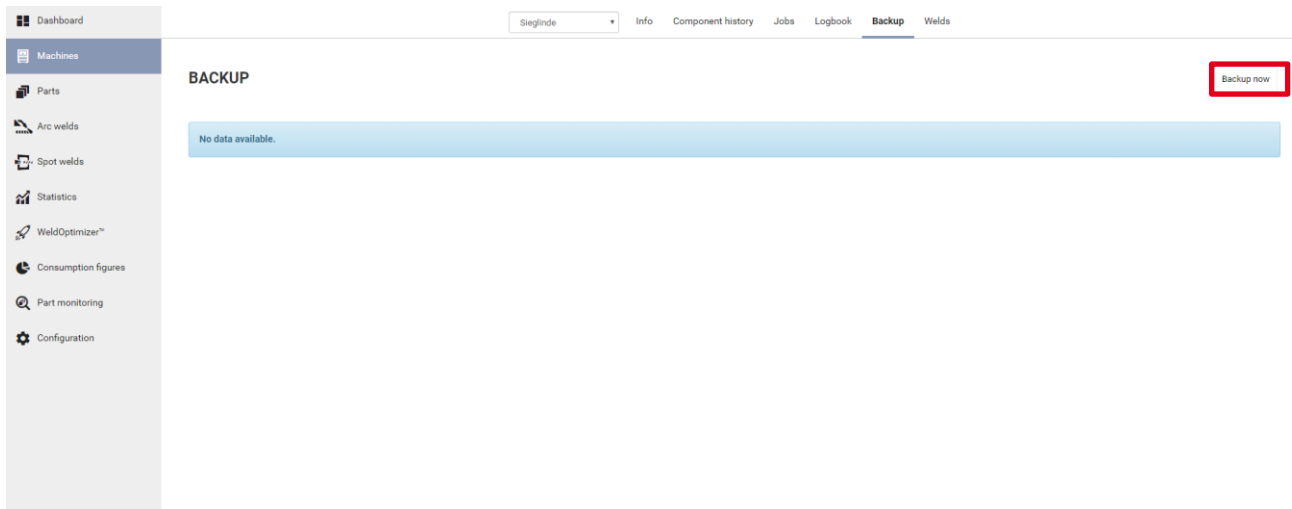
/ Directly at the **machine overview**:



/ At the **machine information page**:

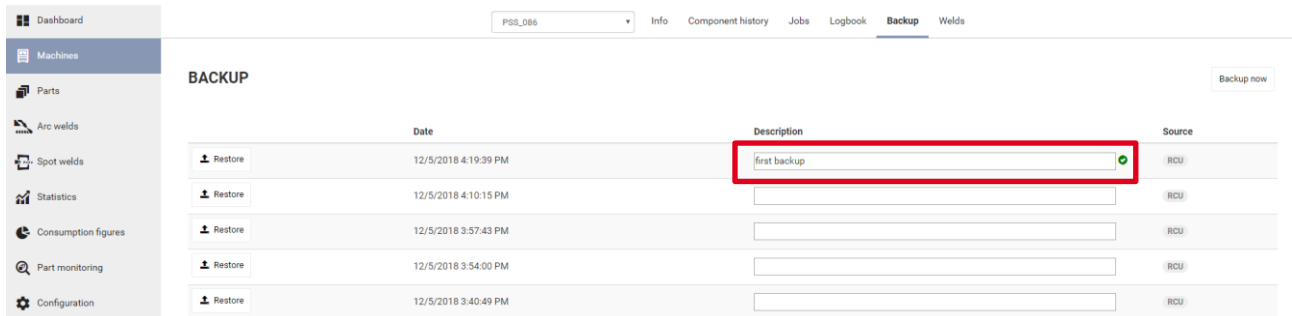


Choosing “backup now” at the backup screen immediately starts backup creation.



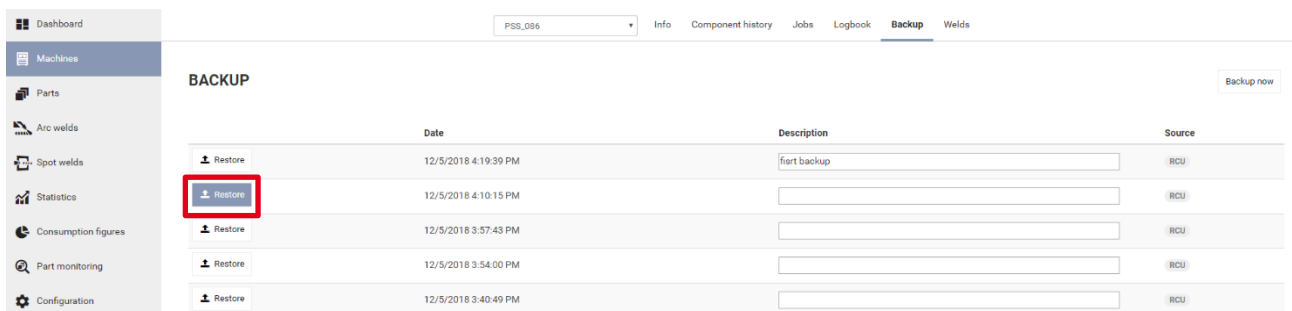
First tests did show that an RCU backup lasts about 1-2 minutes – but: this duration will vary from customer to customer.

Every backup creates its own list entry. There is a description field available for every created backup, which is empty as standard and can be adapted individually by the customer. The text entered there is saved automatically by the system. A green checkmark shows the successful completion of the saving process.



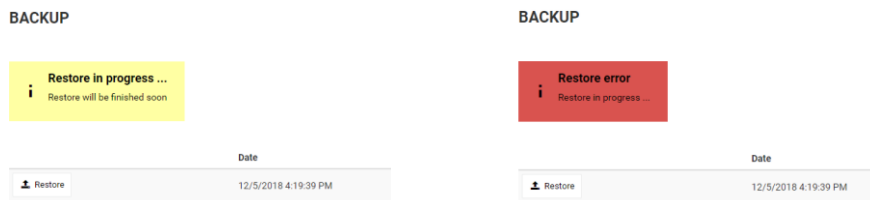
## 2.1.2 Restore

The restore function is also available via the backup menu (see 2.1.1). Every backup entry has its own “restore” button used for starting the restore process.



### 2.1.3 General information on backup / restore

- / Restarting a backup is only possible after the previous backup completes successfully.
- / Every welding device has its own backup list.
- / It is only possible to restore a backup to the welding device it was created for.
- / Yellow or red messages show status or error information.




- / The backup page does not reload dynamically. This means that a new backup is only visible when the user reloads the page manually.














### 2.2 Logbook entry for user login / logout at the welding device (TPS/i)

**TPS/i** user login and logout (via web interface or display) using RFID cards or passwords is recorded within the logbook as of now. Thus, this information is also available for analysis.



Lines with the  icon identify such login / logout records and are thus easily found when checking the list.

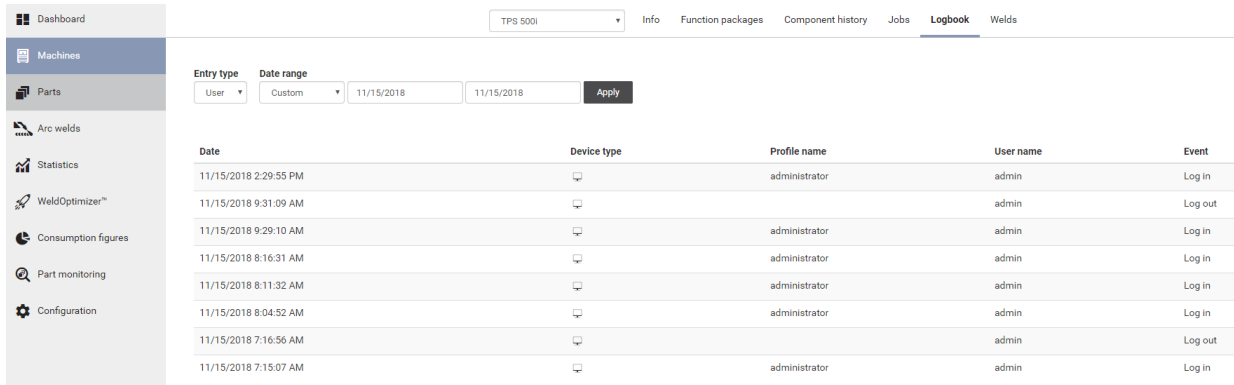
2 different views are available within the logbook using the given filter possibilities:









- / **All:** next to the  icon there is a sentence for informing the user about the action (log in or log out). Additionally the type of logon / logoff is provided.

Date	Event	Details
11/15/2018 2:50:36 PM		Error 18224 (Robot is not ready. Robot ready signal is not set.) occurred, duration 00:59:59
11/15/2018 2:29:55 PM		User admin has logged in as administrator. (Web interface)
11/15/2018 9:45:01 AM		Error 18224 (Robot is not ready. Robot ready signal is not set.) occurred, duration 00:10:05
11/15/2018 9:31:09 AM		User admin has logged out. (Web interface)
11/15/2018 9:29:10 AM		User admin has logged in as administrator. (Web interface)
11/15/2018 8:16:31 AM		User admin has logged in as administrator. (Web interface)
11/15/2018 8:11:32 AM		User admin has logged in as administrator. (Web interface)
11/15/2018 8:08:29 AM		Error 18224 (Robot is not ready. Robot ready signal is not set.) occurred, duration 00:00:07
11/15/2018 8:04:52 AM		User admin has logged in as administrator. (Web interface)
11/15/2018 7:29:44 AM		Error 18224 (Robot is not ready. Robot ready signal is not set.) occurred, duration 00:36:33
11/15/2018 7:16:56 AM		User admin has logged out. (Web interface)
11/15/2018 7:15:07 AM		User admin has logged in as administrator. (Web interface)
11/15/2018 7:07:39 AM		Error 18224 (Robot is not ready. Robot ready signal is not set.) occurred, duration 00:01:37

If “show welder” is deactivated within the user roles, the user name is made anonymous using three asterisks (\*\*\*) .

/ **User:** this view uses  for the TPS/i display and  for the TPS/i website in order to visualize where log in / out took place:



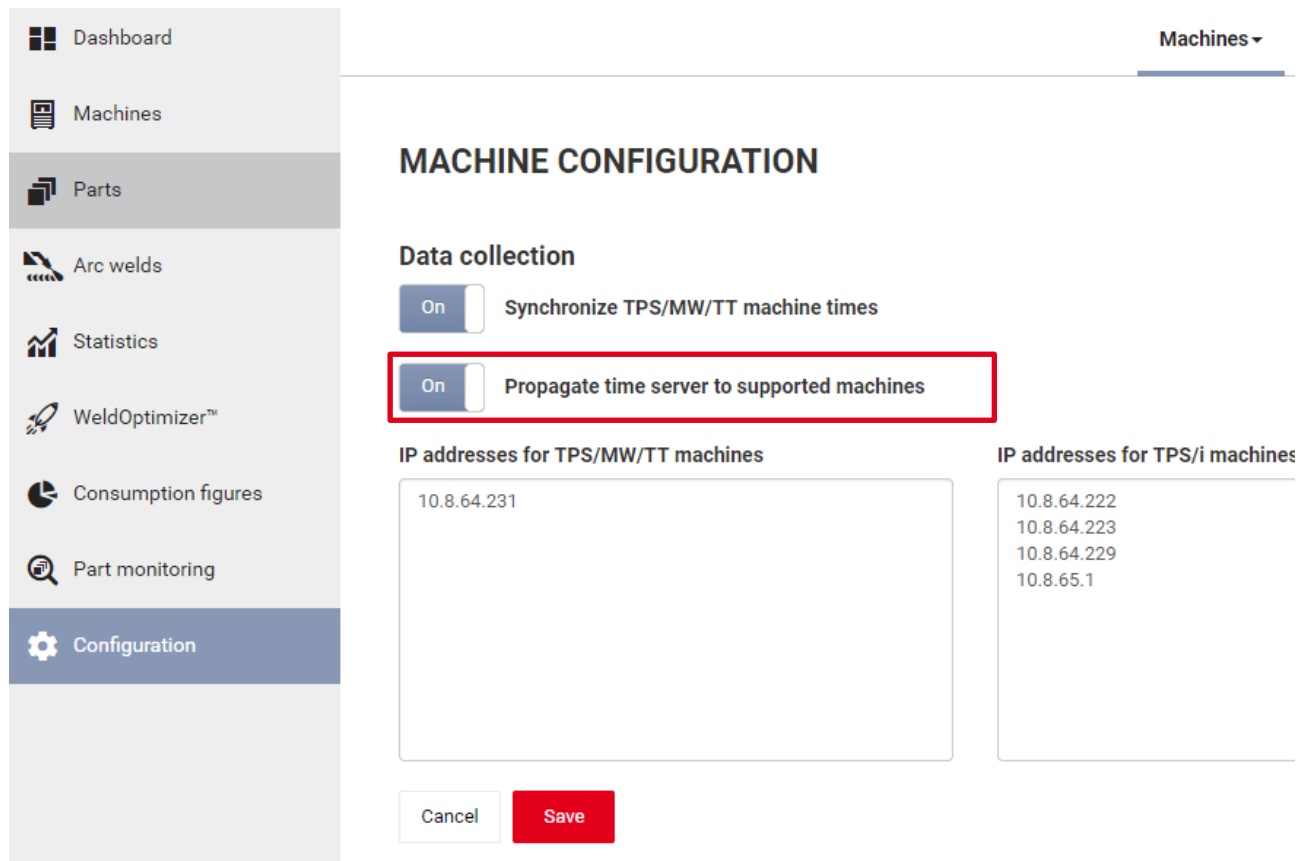
Date	Device type	Profile name	User name	Event
11/15/2018 2:29:55 PM		administrator	admin	Log in
11/15/2018 9:31:09 AM		administrator	admin	Log out
11/15/2018 9:29:10 AM		administrator	admin	Log in
11/15/2018 8:16:31 AM		administrator	admin	Log in
11/15/2018 8:11:32 AM		administrator	admin	Log in
11/15/2018 8:04:52 AM		administrator	admin	Log in
11/15/2018 7:16:56 AM		administrator	admin	Log out
11/15/2018 7:15:07 AM		administrator	admin	Log in

If “show welder” is deactivated within the user roles, the user name is made anonymous using three asterisks (\*\*\*)

## 2.3 Roll-out of time server for Delta Spot

This new option enables the automatic setting of the timeserver defined for WeldCube Premium for all connected DeltaSpot systems.

It is possible to activate / deactivate this option in the configuration menu for “machines“:



**MACHINE CONFIGURATION**

**Data collection**

On Synchronize TPS/MW/TT machine times

On Propagate time server to supported machines

**IP addresses for TPS/MW/TT machines**

10.8.64.231

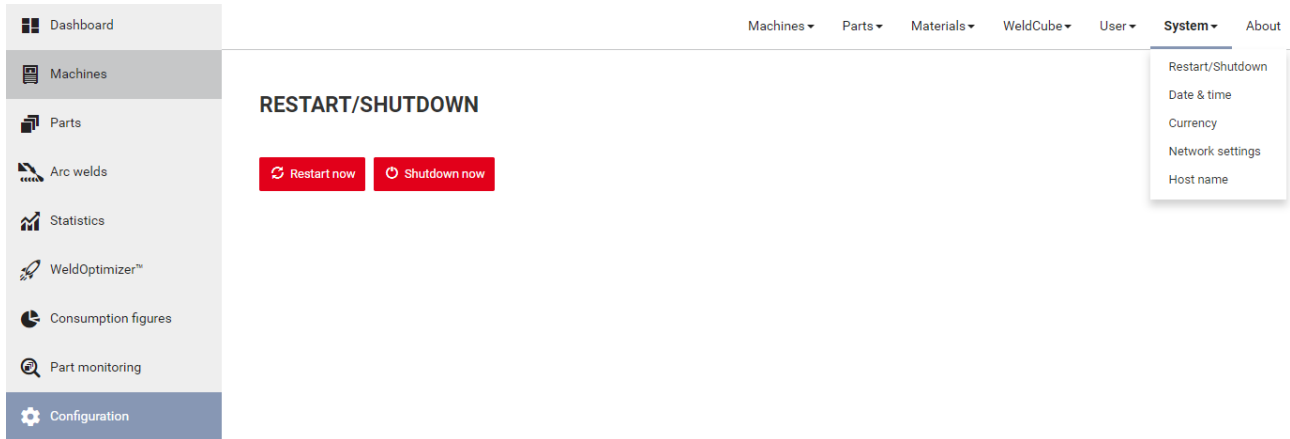
**IP addresses for TPS/i machines**

10.8.64.222  
10.8.64.223  
10.8.64.229  
10.8.65.1

Cancel Save

## 2.4 Shutdown function

Besides the “restart“ button there is now also a „shutdown“ button for shutting down WeldCube Premium. Both functions are available within the configuration menu using the sub menu “system” → “Restart/Shutdown”:



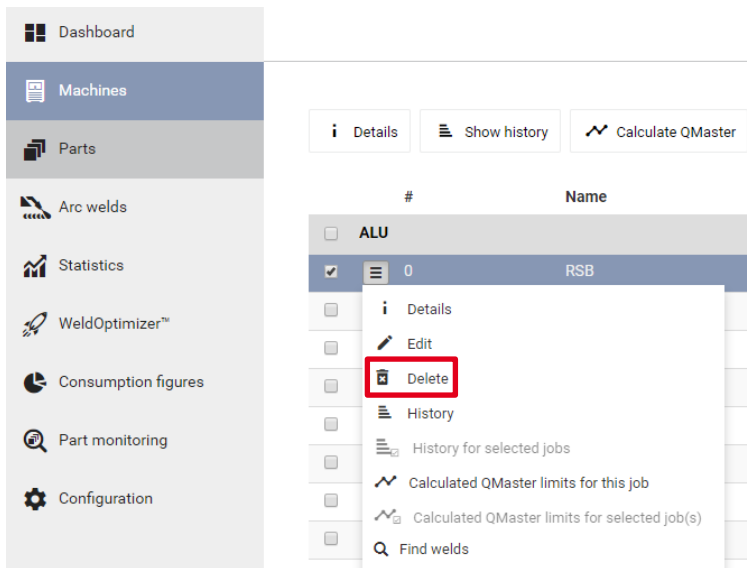


# 3 SET VALUES

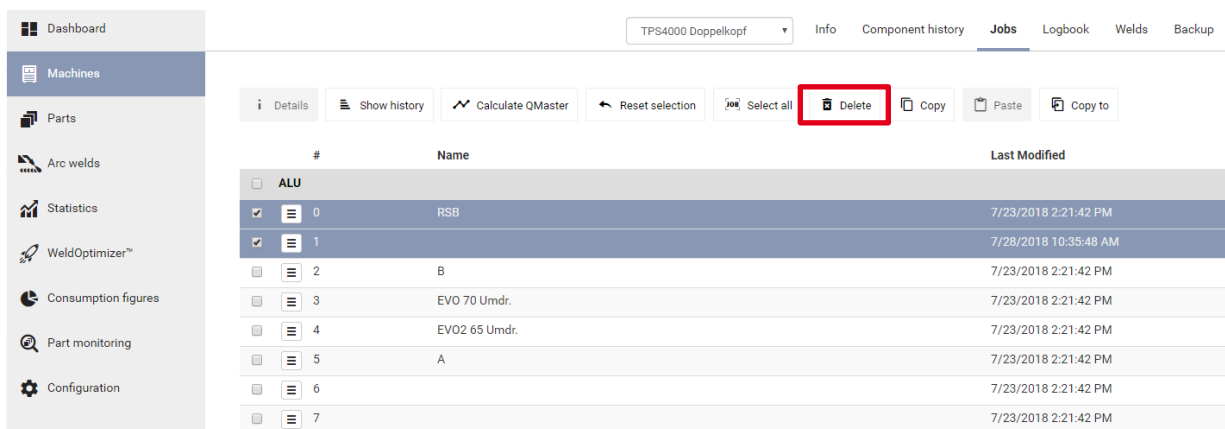
## 3.1 Centrally deleting jobs of TPS and TPS/i using WeldCube Premium

Release 2.2 finally completes the management of welding jobs for TPS and TPS/i by providing the function of centrally deleting jobs. Two possibilities are available at the job overview of a welding device:

/ Deleting single jobs using „Delete“ in the context-menu of the job:



/ Using the **delete button** for the selection made (jobs with checkmark):



When a job was deleted, there is a progress symbol at the right hand-side showing that the delete command is progressed at the welding device. As soon as the job was really deleted at the welding device, a green checkmark appears and the job name is removed from the overview in WeldCube Premium.

Thus, the process for deleting the job/s is successfully completed.

/ Excursus: **restoring** job (settings)

If a deletion was performed by mistake, the job history in WeldCube Premium allows restoring the job:

**HISTORY FOR JOB 1**

← Back to overview   Find welds   Compare   Reset selection   **Restore job**

Date range: Unlimited   Hide unchanged values

Value	4/26/2018 10:54:30 AM	4/9/2018 1:26:13 PM	10/19/2017 3:51:12 PM	<b>3/7/2017 1:48:24 PM</b>	6/7/2017 1:48:24 PM	6/7/2017 1:48:14 PM
<b>Common</b>						
Name	TU 4 Rohr	TU 4 Rohr	TU 4 Rohr	Rohr	Rohr	
Gas	M21 Ar+15-20%CO2	M21 Ar+15-20%CO2	M21 Ar+15-20%CO2	M21 Ar+15-20%CO2	M21 Ar+15-20%CO2	M21 Ar+15-20%CO2
Characteristic	3248	3248	3248	3248	3248	3248
<b>Command values</b>						
Voltage	16.8 V	16.8 V	16.8 V	16.8 V	16.8 V	16.8 V
Current	157 A	157 A	157 A	157 A	157 A	157 A
Material Thickness	1.2 mm	1.2 mm	1.2 mm	1.2 mm	1.2 mm	1.2 mm
Wire Feed Speed	7.0 m/min	7.0 m/min	7.0 m/min	7.0 m/min	7.0 m/min	7.0 m/min
Arclength correction	0.0	0.0	0.0	0.0	0.0	0.0
Trigger mode	S2-step	S2-step	S2-step	S2-step	S2-step	S2-step
Sampling rate	0.1 s	0.1 s	0.1 s	off	off	off
Voltage command value	16.8 V	16.8 V	25.0 V			
lower voltage limit	-1.0 V	-1.0 V	-1.0 V			
upper voltage limit	1.0 V	1.0 V	1.0 V			
max. time of voltage deviation	0.1 s	0.1 s	off			

## 4 ACTUAL VALUES

### 4.1 Gas consumption per weld now also for TPS/i

Gas consumption for TPS/i is now also available with WeldCube Premium.

**Attention:** TPS/i firmware version 2.0.0 required as well as OPT/i gas regulator or gas sensor.

#### 4.1.1 Consumption documentation & visualization per weld seam

Consumption is shown per weld from welding start to welding end as well as per section in liters [l] or in cubic foot [ft<sup>3</sup>] depending on settings.

#### 4.1.2 PDF report

The PDF report (part and weld report) also shows the gas consumption per weld and section.

#### 4.1.3 Statistics

The statistics section provides gas consumption for TPS/i with the same options as for TPS.

Furthermore, it is possible to do and graphically visualize evaluations of gas costs as soon as prices per gas are recorded within WeldCube Premium (within the configuration menu → „materials” → “welding gases”).

#### 4.1.4 Gross gas consumption per weld (TPS/i)

Finally, there will be 2 gas consumption values for TPS/i available at WeldCube Premium:

- / Gas consumption (**net**) describes the consumption from ARC-ON to ARC-OFF
  - / Naming until release 2.1: gasconsumption
  - / Naming from release 2.2: arcgasconsumption
- / Gas consumption (**gross**) describes the consumption from ARC-OFF to ARC-OFF
  - / Naming until release 2.1: NOT AVAILABLE
  - / Naming from release 2.2: gasconsumption

#### Specialities & additional information:

- / Gross gas consumption (gasconsumption) is available for TPS/i only and NOT for TPS – for TPS it will never be available.
- / Gross gas consumption (gasconsumption) is only available at statistics and not for welding details.
- / Net gas consumption (arcgasconsumption) is valid per weld. Thus, it is not possible to group per job number when using statistic filters. This filter possibility is deactivated.
- / Historical values are not updated / adapted. The already existing gas consumption value will be renamed to ArcGasConsumption. The newly measured gross gas consumption value is stored using the naming “GasConsumption”.

Note on statistics report / bookmark / widget:

- / When using a filter for Gas Consumption, there won't be a calculation of gas consumption for old TPS/i values (in contrast to new welds produced after updating to release 2.2).
- / All filters have to be set to Arc Gas Consumption in order to receive continuous and valid information

## **4.2 Higher sampling rate for spot welds available as of now**

Until now, the sampling rate for documentation values (set and actual values) for spot welds was defined with two milliseconds. As of now, also sampling rates below one millisecond [ms] are supported.

It is up to the spot welding server to define the sampling rate. Currently, 0.5 ms (500 micro seconds) are a common resolution.

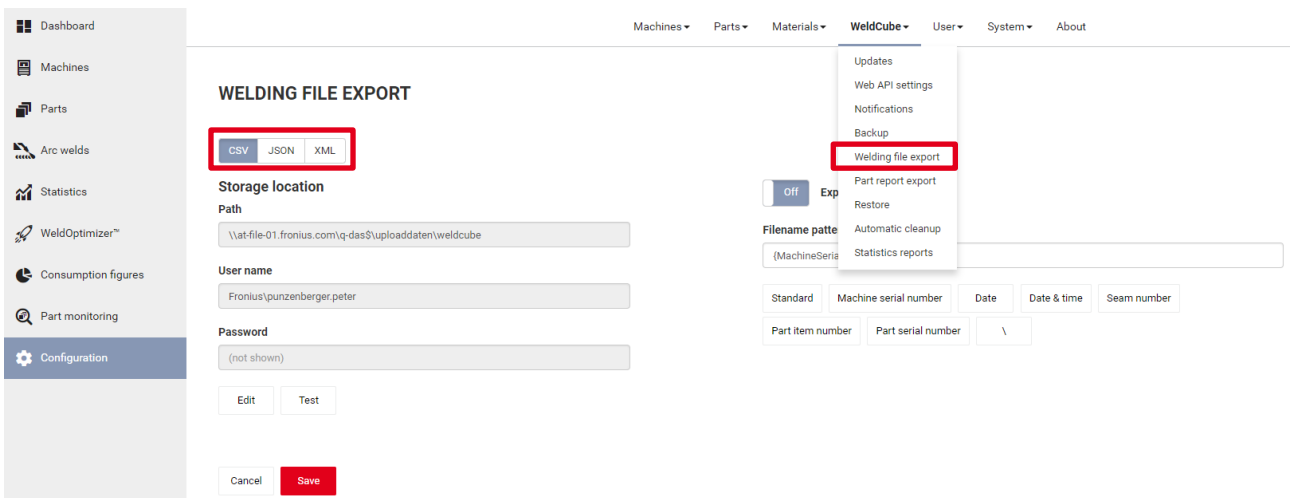
# 5 DATA INTERFACE / API

## 5.1 XML & JSON as new formats for file export

In addition to the existing CSV export, WeldCube Premium now also provides the formats

- / XML and
- / JSON

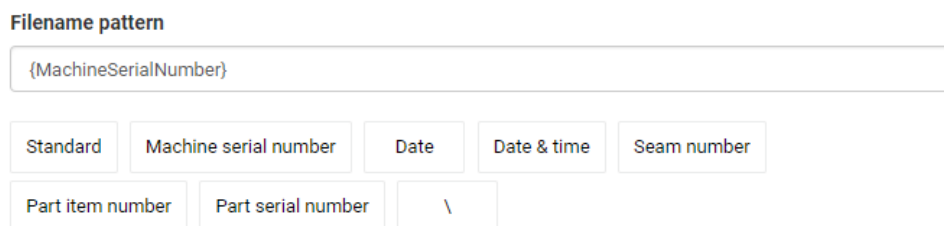
for **exporting welds**. The main advantage of these two formats is the hierarchically structured storage of exported data. This allows providing more information than with a CSV export.



Customers can flexibly configure the storage structure (file names) of the export files using patterns. This means that every customer can define the storage structure of the files by himself using the available parameters:

- / Machine serial number
- / Date (with and without time)
- / Seam number
- / Part item number
- / Part serial number

Using those parameters, the desired path is built. Alternatively, it is always possible to use the standard.



It is possible to define a separate storage location (network drive) as well as a separate pattern for storage per export format.

## 5.2 REST-API

The following functions are now available via web API (“REST” format) of WeldCube Premium:



- / List of all welding devices including device data
- / Jobs of welding devices and job details
- / Welds and weld details

### 5.2.1 Welding devices and device data

The following information is available per welding device:

- / Name (“Name“)
- / Model – e.g. TPS 500i (“Model“)
- / Type – e.g. TPS/i (“MachineType“)
- / Serial number (“Serialnumber“)
- / IP address (“IpAddress“)
- / Location (“Location“)

[Route(“api/v1/Machine/“)]

**Attention:** only visible machines will be provided via the API. Visibility of devices is defined using the configuration menu → “machines“ → „machine visibility“:

The screenshot shows the 'MACHINE VISIBILITY' configuration page. A dropdown menu is open under 'Machines', with 'Machine visibility' highlighted. The table below lists machines with columns for Serial number, Name, IP address, and Visible. The 'Visible' column contains checkboxes, with the first and last rows checked.

Serial number	Name	IP address	Visible
09424058	TPS4000 Doppelkopf	10.8.64.231	<input checked="" type="checkbox"/>
16440355	RSC	10.6.32.255	<input type="checkbox"/>
25451504	TPS5000CMT	10.8.64.229	<input type="checkbox"/>
23370458	TPS320i	10.8.65.1	<input checked="" type="checkbox"/>
28157932	TPS 500i	10.8.64.229	<input checked="" type="checkbox"/>

### 5.2.2 List of all jobs per welding device

Based on providing the serial number of a welding device, all jobs of this serial number including revision number are available with the following information range:

- / Job name (“Name“)
- / Job number (“Nr“)
- / Revision number (“Revision“)
- / Date & time of the last job change (“LastModified“)
- / Link to job details

[Route(“api/v1/Machine/{machineSerialNumber}/Job/“)]

### 5.2.3 Job details per Job

Based on providing job & revision number, all job parameters are available.

```
[Route("api/v1/Machine/{machineSerialNumber}/Job/{jobnumber}", Name = "JobDetails")]
```

### 5.2.4 List of all welds

The API provides the following information on welds:

- / Welding ID ("ID")
- / Time stamp of the weld ("Timestamp")
- / Process step ("ProcessingStepNumber")
- / Part serial number ("PartSerialNumber")
- / Part item number ("PartItemNumber")

```
[Route("api/v1/Weldings", Name = RouteHelper.WeldingList)]
```

Further information:

- / Using "from" and "to" it is possible to define the period for the request.
- / A maximum of 200 welds is loaded at once
- / Details on the welds are separately requested using the Welding ID (see 5.2.5)

### 5.2.5 Weld details

Based on providing the Welding ID, data on welds are provided via several linked functions<sup>1</sup>. The following data is available:

- / Welding ID ("ID")
- / Part item number ("PartItemNumber")
- / Part serial number ("PartSerialNumber")
- / Process step ("ProcessingStepNumber")
- / Serial number of welding device ("WeldingSystemSerialNumber")
- / Welder ("Welder")
- / Time stamp of the weld ("TimeStamp")
- / Duration of the weld ("Duration")
- / Information on
  - / jobs,
  - / sections and
  - / actual values

is provided as link for separate calls ("WeldingData")

```
[Route("api/v1/Weldings/{weldingId}", Name = RouteHelper.WeldingDetails)]
```

---

<sup>1</sup> Links to weld details are provided.

## Section details

Using this call, weld details are provided on a section basis.

```
[Route("api/v1/Weldings/{weldingId}/Section/{sectionNumber}", Name =  
RouteHelper.WeldingSectionDetails)]
```

## Actual Values

This call provides actual values for the weld based on the ID. A sampling range of up to 100 ms is available depending on the configuration of the welding device itself (FS Doku / RCU / OPT/i Documentation required).

```
[Route("api/v1/Weldings/{weldingId}/ActualValues", Name = RouteHelper.WeldingActualValues)]
```

## 5.2.6 Versioning

In order to support our customers' mode of operation at the best, we decided for a versioning of our API. This means that changes of existing API functions are only provided with a new API version.

Thus...

- / ...customers can keep on using the existing functions.
- / ...customers can decide by themselves if and when they want to use the new version of a function.

## 5.2.7 API in general

- / Times are always given in **UTC** via the API
- / Units are always given using the **metric** format via the API

## 5.2.8 Swagger documentation for REST API

A Swagger documentation is available for WeldCube Premium's REST-API. It is available at the configuration menu via "WeldCube" → "Web API settings":

### / Selecting documentation

The screenshot shows the WeldCube web interface. On the left is a navigation sidebar with items like Dashboard, Machines, Parts, Arc welds, Statistics, WeldOptimizer™, Consumption figures, Part monitoring, and Configuration. The top navigation bar includes Machines, Parts, Materials, WeldCube, User, System, and About. The main content area is titled 'WEB API SETTINGS' and contains a table with two columns: 'Key' and 'Notes'. The table has one row with a key 'c6d1b0e7a3f98c3b68f6ed4d181c1421' and notes 'asdf'. Below this row, a red box highlights a link labeled 'API documentation'. A dropdown menu is open under the 'WeldCube' header, listing options: Updates, Web API settings, Notifications, Backup, Welding file export, Part report export, Restore, Automatic cleanup, and Statistics reports.



/ Look & Feel of the documentation:

## WeldCube Premium API version 1

This is an interactive documentation of the web API on the WeldCube Premium.

An API call requires an authorization key which can be generated at the Web API page in the WeldCube Premium configurations.

### Machine

Show/Hide | List Operations | Expand Operations

GET	/api/v1/Machine	Lists all Machines known by the WeldCube
GET	/api/v1/Machine/{machineSerialNumber}/Job	Lists all actual Jobs of a specific machine
GET	/api/v1/Machine/{machineSerialNumber}/Job/{jobNumber}	Gets the current details including values of a specific job

### Part

Show/Hide | List Operations | Expand Operations

GET	/api/v1/Part/{partItemNumber}/{partSerialNumber}/Export/Pdf	Enqueues part report generation
-----	---	---------------------------------

### ProductionDiagnosis

Show/Hide | List Operations | Expand Operations

GET	/api/v1/ProductionDiagnosis/Get	Provides production information about this WeldCube
-----	---------------------------------	---

### User

Show/Hide | List Operations | Expand Operations

POST	/api/v1/User	Creates a new WeldCube User
------	--------------	-----------------------------

### Weldings

Show/Hide | List Operations | Expand Operations

GET	/api/v1/Weldings	Lists all Weldings known by the WeldCube
GET	/api/v1/Weldings/{weldingId}	Gets the welding details
GET	/api/v1/Weldings/{weldingId}/Section/{sectionNumber}	Gets the section details
GET	/api/v1/Weldings/{weldingId}/ActualValues	Gets the actual values of a welding

## 5.2.9 WeldCube Premium REST-API – customer benefits



- / 1 standard data interface for all Fronius devices connected to WeldCube
  - / One “contact” for the customer’s system/s.
  - / Standardized communication for different welding devices.
- / All information on welds & set values are available via the interface which the customer can then use individually.
- / Continuous further development of the functional range.
- / No additional costs (covered by the Maintenance Subscription).

## **6 NOTE: WELDCUBE PREMIUM & MCU EXCHANGE TPS/I**

Whenever TPS/i welding devices are connected to WeldCube Premium for documentation purposes it is essential to consider that there are automated rules applying at WeldCube Premium if the MCU of such a TPS/i is exchanged.

**As a result it is required to update WeldCube Premium to version 2.2 PRIOR to exchanging the MCU. Afterwards the MCU exchange can take place.**

If the WeldCube Premium version is 2.1 or lower instead when exchanging the MCU, there will not be any welding data transfer from TPS/i to WeldCube Premium afterwards any more.

**Subsequently updating WeldCube Premium to version 2.2 will NOT fix this problem!**