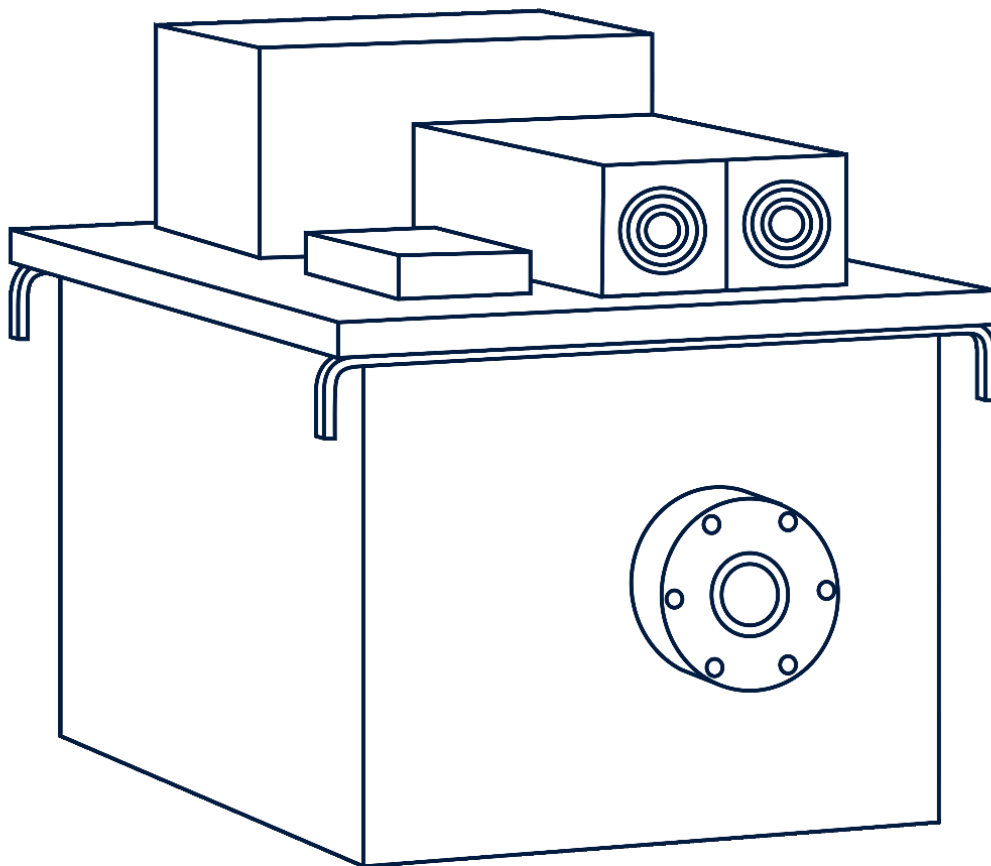


Integrator manual

# Web UI Manual

SW V.4.0.0



# Copyright

Copyright by COMET AG, 3175 Flamatt, Switzerland, Herrengasse 10

COMET AG is the copyright holder. All rights reserved.

When receiving data carriers, the recipient acquires the personal, non-transferable and non-exclusive limited license for the use and storage of the software in conjunction with the hardware supplied by COMET AG.

Modifications of the software supplied in conjunction with hardware components other than those supplied by COMET AG or copying of the software, except for data backups, are to be first approved by COMET AG in writing.

All rights reserved. This documentation may not be copied, duplicated, reproduced, translated or transferred to electronic media or any other device, completely or partly, without the prior written approval of COMET AG.

COMET AG (hereinafter referred to as Comet) reserves the right to make any modifications in its products required for their technical development. These modifications are not necessarily documented in each individual case.

This installer (integrator) and operator manual and the information contained therein have been compiled with all due care and diligence.

The trademarks and product names mentioned in this installer and operator manual are brands or registered brands of the respective title holders

# Content

<b>1</b>	<b>Information</b>	<b>5</b>
1.1	Purpose	5
1.2	Scope	5
<b>2</b>	<b>Web User Interface specification</b>	<b>6</b>
2.1	Start conditions	6
<b>3</b>	<b>Generator information</b>	<b>7</b>
<b>4</b>	<b>HV operation</b>	<b>8</b>
4.1	Input and measurement data	10
4.1.1	High voltage	10
4.1.2	Tube current	10
4.1.3	Exposure time	10
4.1.4	Focal spot	10
4.2	Status	10
4.2.1	System status, operating status and operating sub-status	10
4.2.2	Shutdown reason	10
4.2.3	Boot error	10
4.2.4	HVPS error	10
4.2.5	Warning code	11
4.3	Emission graph, measurement details, temperatures	11
4.4	Not-ready conditions	11
4.5	Warm-up	11
<b>5</b>	<b>Software update</b>	<b>12</b>
5.1	Generator mains software	13
5.1.1	System update	13
5.2	Components	13
5.2.1	Installed versions	13
5.2.2	Equalize versions	13
5.3	Reset/Restore Generator	13
5.3.1	Rollback	13
<b>6</b>	<b>Reports</b>	<b>15</b>
6.1	Download	16
6.1.1	Download all reports	16
6.1.2	Diagnostic report	16
6.1.3	Operational report	16
6.1.4	Operational report history	16
6.2	Event log	16
<b>7</b>	<b>Service operation</b>	<b>17</b>
7.1	Testing	17
7.1.1	Filament check (not required for Mesofocus)	18

7.1.2	Cycle test	18
7.1.3	HV range test	18
7.1.4	Value switching test	18
7.2	Configuration reset	18
7.2.1	Reset to default	18
<b>8</b>	<b>Generator setup</b>	<b>19</b>
8.1.1	Data and time	21
8.1.2	Tube and cable	21
8.1.3	Tube data set install	21
8.2	Reset tubes to release	21
8.3	Configuration	21
8.3.1	Export	21
8.3.2	Import	21
<b>9</b>	<b>I/O configuration</b>	<b>22</b>
9.1	General	23
9.2	Phase selection	23
9.3	Blink period	23
9.4	Current monitoring thresholds	23
9.5	Dynamic monitoring	23
<b>10</b>	<b>Communication configuration</b>	<b>24</b>
10.1	Network	24
10.2	Remote control	25
10.3	Guarded communication	25
10.4	Serial	25
10.5	Legacy MG Protocol	25
<b>11</b>	<b>Application configuration</b>	<b>27</b>
11.1	Settings	27
11.1.1	Prewarning	27
11.1.2	Cooler	28
11.1.3	Warm-Up	28
11.1.4	Filament control (not for Mesofocus)	28
11.1.5	Initial operation parameters	28
11.2	Additional limits	29
11.2.1	High-voltage	29
11.2.2	Tube current	30
11.2.3	Filament	30
11.2.4	Power	31

# 1 Information

## 1.1 Purpose

This Web UI Manual describes how to operate and adjust the settings of the iVario generator with the Web User Interface (Web UI) server application. All possible applications of the Web UI are described, and corresponding functionalities are explained in detail. All default values are documented and allow configuring a general X-Ray set up with this user manual.

## 1.2 Scope

This document is intended for OEM users who configure or operate the iVario generator. It is part of the iVario engineering documentation (including OEM Manual, description of the T3 protocol and T3 Status). This Web UI Manual presumes basic knowledge about the configuration and a deep understanding of the iVario Generator family.

## 2 Web User Interface specification

AUX supply is required to be able to connect with the iVario generator after the booting process (LED A2 is steady shining green after successful reboot –for more information consult the OEM Manual).

### 2.1 Start conditions

1. Restart the iVario generator (AUX off-on).
2. Open a browser window, e.g. Edge or Chrome.
3. Enter the IP address into the browser's address bar, e.g. 192.168.177.199
4. Press the RETURN key.
5. The Web UI login page is displayed. Please enter a valid username (oem, ser) and the corresponding password.
6. Click the Login button

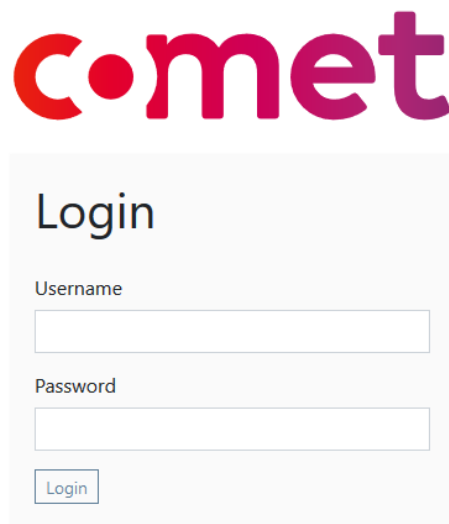



Fig. 1: Web UI login page

### 3 Generator information


Normal Operation Mode
ser

Operation

Generator Info

HV Operation

Reports

Software Update

Service Operation

Setup

Generator

I/O

Communication

Application

## Generator Information

Main Software Version

V.4.0.0.b28256a

General Settings

Part	Setting
Cathode Tank	225mf-
Anode Tank	225mfkaveri+
Tube Type	MXC-450MF (mxc-450mf)
Cable Length	5 m
Network IP	192.168.177.222
Network MAC	50:2d:f4:1a:1c:7e

Component Software

Part	SW Version
IFC	V.4.0.0.b28256a
BSP	V.4.0.0.8ae4939
POC1 node-cpu	V.4.0.0.b28256a
POC1 safety-cpu	IAR: Jul 18 2016 0.7 E115
POC1 bootloader	V.1.14
POC2 node-cpu	V.4.0.0.b28256a
POC2 safety-cpu	IAR: Jul 18 2016 0.7 E115
POC2 bootloader	V.1.14
Cathode tank	V.4.0.0.b28256a
Anode tank	V.4.0.0.b28256a
ECU node-cpu	V.4.0.0.b28256a
ECU bootloader	V.1.13

Hardware

Part	Revision Nbr	Material Nbr	Serial Nbr
HVPS	2	20125466	987654
IFC	8.0	20125739	845934
POC1	21.0	20073209	4503
POC2	21.0	20073209	4504
Cathode tank	2.0	20117384	567248
Anode tank	10.0	11111	22222
Tube	N/S	915707.50	0000005
ECU	2.0	20115532	795482

Fig. 2: General information

Basic information is summarized on this page. The page covers software versions, general iVario generator settings and the stored hardware information.

On the header the operating mode is visible for the user as well as the user information on the right-hand side.

The left side is user dependent and will variate depending on which user is logged in. The navigation in Fig. 2: with current possible elements is presented and will appear in such shape only for the service technician user “ser”.

Legend for returned values:

- Empty or “.” → hardware component not installed
- N/A → not available (device or data cannot be read)
- N/S → not specified (data are not set on the iVario generator and the default value)

# 4 HV operation

This is the landing page.  
Operating the iVario generator is possible through this page and the status of the iVario generator can be supervised.

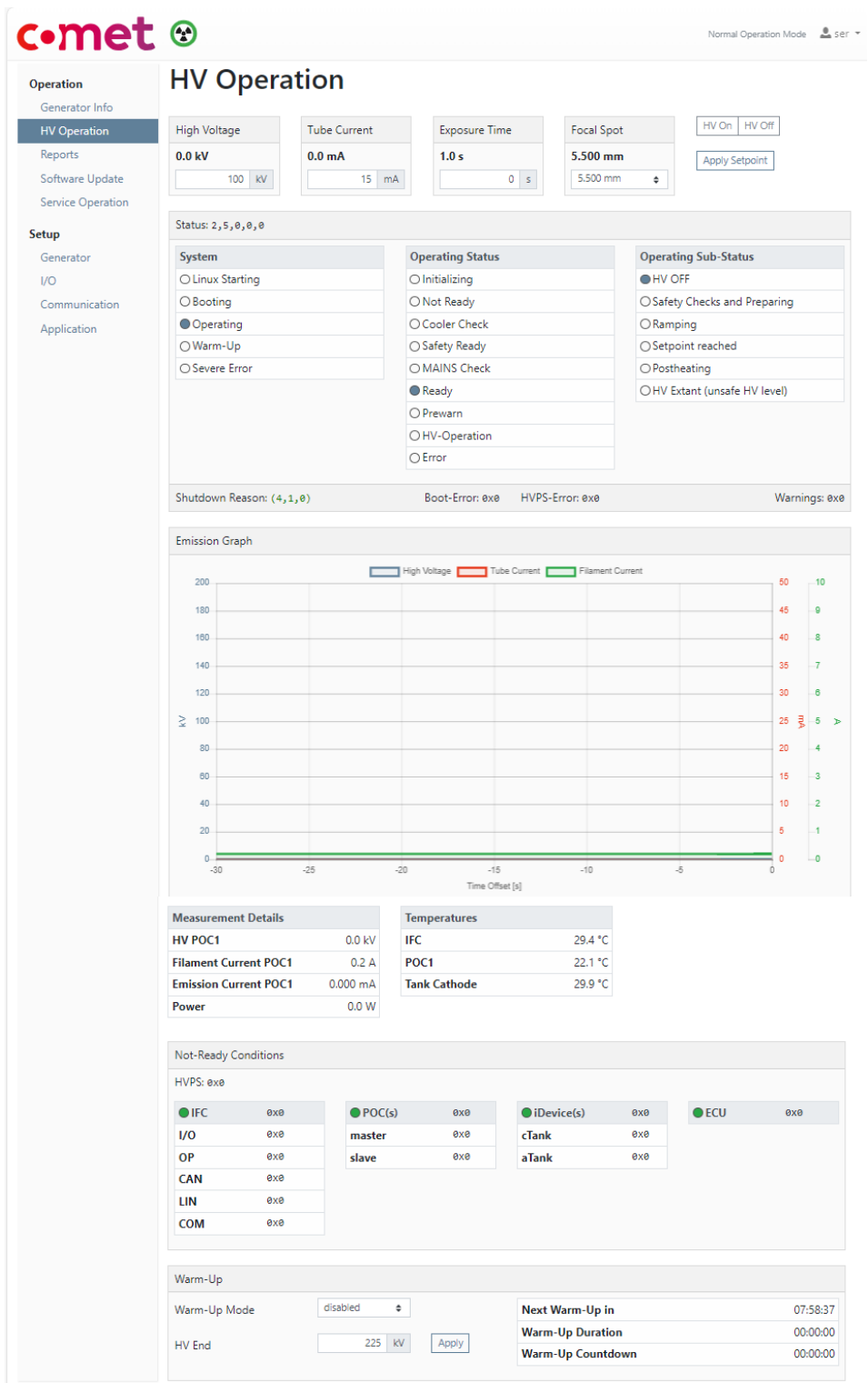


Fig. 3: HV operation for an iVario generator iVario-225



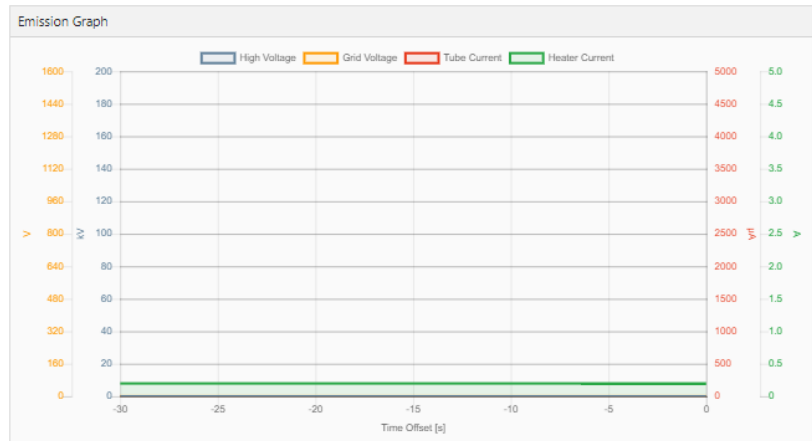
## HV Operation

High Voltage <b>0.0 kV</b> 50 kV	Tube Current <b>0.0 <math>\mu</math>A</b>	Exposure Time <b>0.0 s</b> 0 s	Focal Spot <b>0.200 mm</b> 0.200 mm	HV On HV Off Apply Setpoint Normal Operation Apply
--	--	--------------------------------------	---	--

Status: 2, 5, 0, 0, 0

<b>System</b> <input type="radio"/> Linux Starting <input type="radio"/> Booting <input checked="" type="radio"/> Operating <input type="radio"/> Warm-Up <input type="radio"/> Severe Error	<b>Operating Status</b> <input type="radio"/> Initializing <input type="radio"/> Not Ready <input type="radio"/> Cooler Check <input type="radio"/> Safety Ready <input type="radio"/> MAINS Check <input checked="" type="radio"/> Ready <input type="radio"/> Prewarn <input type="radio"/> HV-Operation <input type="radio"/> Error	<b>Operating Sub-Status</b> <input checked="" type="radio"/> HV OFF <input type="radio"/> Safety Checks and Preparing <input type="radio"/> Ramping <input type="radio"/> Setpoint reached <input type="radio"/> Postheating <input type="radio"/> HV Extant (unsafe HV level)
---	---	--

Shutdown Reason: (0, 0, 0)      Boot-Error: 0x0      HVPS-Error: 0x0      Warnings: 0x0



Measurement Details	Temperatures	ECU Details
HV POC1 0.0 kV	IFC 28.5 °C	HV ECU 0.1 kV
Power 0.0 W	POC1 18.6 °C	Heater Current ECU 0.194 A
	Tank Cathode 29.0 °C	Heater Voltage ECU 0.2 V
	ECU Board 28.6 °C	Emission Current ECU 0.000 mA
	ECU Oil 32.8 °C	Em. Curr. w/o LC comp ECU 0.004 mA
		Grid Voltage ECU 1.0 V

Not-Ready Conditions

HVPS: 0x0

<input checked="" type="radio"/> IFC 0x0 I/O 0x0 OP 0x0 CAN 0x0 LIN 0x0 COM 0x0	<input checked="" type="radio"/> POC(s) 0x0 master 0x0 slave 0x0	<input checked="" type="radio"/> iDevice(s) 0x0 cTank 0x0 aTank 0x0	<input checked="" type="radio"/> ECU 0x0
--	--	---	--

Warm-Up

Warm-Up Mode disabled

HV End 225 kV Apply

Next Warm-Up in 06:41:57

Warm-Up Duration 00:00:00

Warm-Up Countdown 00:00:00

Fig. 4: HV operation for an iVario Mesofocus generator iVario-225MF

## **4.1 Input and measurement data**

The desired high voltage value, tube emission current, exposure time and focal spot are presented as input and measurement values. The values will only be stored after pressing the button "Apply Setpoint". Further the generator can get switched on/off with the buttons "HV On" and "HV Off".

### **4.1.1 High voltage**

It shows the received value from the data server and representing the initially measured signal from the POC's. The values from POC 1 and POC 2 must be within the range of tolerance because they operate in parallel if two POCs are connected.

Range: 0kV – iVario generator limit. Minimum set value is limited by the installed tube, e.g. 10kV for a 225kV minifocus tube or 50kV for a mesofocus tube 225MF.

### **4.1.2 Tube current**

0mA – iVario generator limit (22mA 1 POC / 45mA 2 POC or less depending on the max. tube current allowed)

### **4.1.3 Exposure time**

Exposer time can operate in two different modes. The value will increment since the exposure has been started if the value in the input box is zero (before pressing button "HV On"). None zero values will change the live value from the exposure timer into a countdown timer with the initial value from the input box.

### **4.1.4 Focal spot**

It shows and sets the focal spot size of the electron beam. The power limits are dependent on this setting.

## **4.2 Status**

### **4.2.1 System status, operating status and operating sub-status**

The values return the actual status of the iVario generator in five numbers. In the specific boxes (ex. System, ...) it is presented in a human readable form and the filled dot, marks the status of the iVario generator. If the warm-up mode is not set to "disabled", the last box changes to the "Warm-up Sub-Status".

### **4.2.2 Shutdown reason**

This value represents the shutdown reason and is generated by the sum of reasons coming from the iVario generator. Further details will appear above codes as you hover over the text/number.

### **4.2.3 Boot error**

The number shows the detailed information about a boot error. Further details are displayed as you hover over the number.

### **4.2.4 HVPS error**

If during normal operation a severe error occurs this is showed as HVPS-Error. Further details are displayed as you hover over the number.

### 4.2.5 Warning code

It visualizes the warnings from the iVario generator in a hexadecimal code as you hover over the label will display further details.

## 4.3 Emission graph, measurement details, temperatures

More detailed measurements are shown in this section.

## 4.4 Not-ready conditions

More detailed information about the component (e.g. IO, CAN, LIN ...) and/or service (e.g. data-server, lin-svc, ...) specific reasons can be extracted from the HEX code in the bar. To get the detailed view, the user must click on the bar and the dedicated component. Further information is available in the T3 status manual or in the service manual.

## 4.5 Warm-up

If the tube was not used for some time, it is favorable to slowly increase the HV as well as the emission current. Depending on the set type of the warm-up and the time since the tube was used the last time, the required steps are calculated. After the warm-up procedure it is possible to operate the iVario generator again without executing a warm-up until a next one is required. Depending how long tube and generator were not used a different warm-up mode should be done: short, medium, long

If a tube shall not be used over the full voltage range a reduced warm up can be done. The warmup will increase the voltage only up to the specified HV End.

Status: 3,5,0,0,0		
<b>System</b> <ul style="list-style-type: none"><li><input type="radio"/> Linux Starting</li><li><input type="radio"/> Booting</li><li><input type="radio"/> Operating</li><li><input checked="" type="radio"/> Warm-Up</li><li><input type="radio"/> Severe Error</li></ul>	<b>Operating Status</b> <ul style="list-style-type: none"><li><input type="radio"/> Initializing</li><li><input type="radio"/> Not Ready</li><li><input type="radio"/> Cooler Check</li><li><input type="radio"/> Safety Ready</li><li><input type="radio"/> MAINS Check</li><li><input checked="" type="radio"/> Ready</li><li><input type="radio"/> Prewarn</li><li><input type="radio"/> HV-Operation</li><li><input type="radio"/> Error</li></ul>	<b>Warm-Up Sub-Status</b> <ul style="list-style-type: none"><li><input checked="" type="radio"/> Initialization</li><li><input type="radio"/> Starting up</li><li><input type="radio"/> Filament heating</li><li><input type="radio"/> Post Filament heating</li><li><input type="radio"/> HV ramping</li><li><input type="radio"/> HV stabilization</li><li><input type="radio"/> Current ramping</li><li><input type="radio"/> Stabilization</li><li><input type="radio"/> Paused</li><li><input type="radio"/> Interrupted by user</li></ul>
Shutdown Reason: (0,0,0)      Boot-Error: 0x0      HVPS-Error: 0x0      Warnings: 0x0		

Fig. 5: Status information during warm-up mode

# 5 Software update

This page provides the update feature of all the different components in the iVario generator, dependent on the connected hardware components. The current status of the operation (e.g. during update) is provided in a page overlay window.

comet

Normal Operation Mode ser

Operation

Generator Info

HV Operation

Reports

Software Update

Service Operation

Setup

Generator

I/O

Communication

Application

Software Update

Generator Main Software

Installed Version

Part	SW Version
IFC	V.4.0.0.b28256a

System Update

Updates the generator software including all components.

☒ Restore Configuration

☐ Force update

Source

USB

Start system update

Components

Installed Versions

Part	SW Version
POC1 node-cpu	V.4.0.0.b28256a
POC2 node-cpu	V.4.0.0.b28256a
Cathode tank	V.4.0.0.b28256a
Anode tank	V.4.0.0.b28256a
ECU node-cpu	V.4.0.0.b28256a

Equalize Versions

Equalize

Reset / Restore Generator

Rollback

Start Rollback

Fig. 6: Software update

## 5.1 Generator mains software

### 5.1.1 System update

If “Restore Configuration” is checked, the current configuration will be kept. If it gets unchecked, the default configuration will be loaded after the software update, e.g. the configuration will be restored to default values and configuration files/parameters will be generated from scratch.

Three sources are possible for a software update:

#### USB

Executing this update requires a USB stick by default and the desired SW to proceed with the update. The SW is expected on the root folder (ex. D:\) of the USB stick and has to be named “t3-release.fw”. The external storage device must be plugged into X6. Press “Start system update” to trigger the update procedure. When successfully started a page overlay window will appear with detailed information.

#### URL

It is also possible to execute the update through a given URL. Select the source “URL” and write the desired link into the predefined input field (ex. `http://<path>/<release version string>/<SW package name>`). Press the button “Start system update” to trigger the update procedure.

#### File

The third possibility to run a SW update is through a file on the device where the Web UI is open in the browser. Select the source “File” and load the desired file by pressing the button “Choose File”. Once the file has been selected the name of the file will be visible next to the button. Press the button “Start system update” to trigger the update procedure.

## 5.2 Components

### 5.2.1 Installed versions

In the table all currently installed SW versions are visible and shall be the same for each component. The main SW version from the iVario generator is visible on top of the page.

### 5.2.2 Equalize versions

This feature is useful in two cases. First it is possible to change the version of a single connected component to the IFC and further it is possible to update connected components to the IFC in case of problems during an update procedure. Pressing this button will check all components connected to the IFC and update only if the SW version is not matching with the IFC version. While the update of a specific device is running the status is showed in a page overlay. “updating <Device> ...”.

## 5.3 Reset/Restore Generator

### 5.3.1 Rollback

If problem occurs after an update, it is possible to go back one step and reload the previous software version before the last update was triggered. The following parameters are set back to the previous configuration:

- COM configuration (IP, Serial configuration)

- I/O configuration
- Application configuration
- Report history
- Tube selection
- Cable selection

# 6 Reports



Operation

Generator Info

HV Operation

Software update

Reports

Service Operation

Setup

Generator

I/O

Communication

Application

## Reports

### Download

Download all reports

If you press "Download all reports" all reports will be created in sequence. Up to 3 download pop-ups will be generated.  
*This can take up to 10 minutes.*  

Download all reports

Diagnostic Report

If you press "Download Diagnostic Report" the report (incl. the operational-report) will be created first.  
*This can take up to 5 minutes.*  

Download Diagnostic Report

Operational Report

If you press "Download Operational Report" the report will be created first.  
*This can take up to 30 seconds.*  

Download Operational Report

Operational Report History

If you press "Download Operational Report History" the long term Operation Report will be created.  
*This can take up to 5 minutes.*  

Download Operational Report History

## Event Log

Filter...

✕

Q

✕ ERROR 0

⚠ WARNING 0

ℹ INFO 7

OTHER 8

⏸ Pause

Nov 9 13:16:35 IFC: [NOTE] statistics \*\*\*\*\* Exposure #24 sta^

Nov 9 13:16:37 IFC: [NOTE] op-svc 2007[ms] from operating status 'Ready' to HV

Nov 9 13:16:37 IFC: [INFO] op-svc Setpoint reached after 144ms, re-setting req

Nov 9 13:16:52 IFC: [INFO] op-svc Workpoint change (demanded/used): expCurr[m2

Nov 9 13:16:52 IFC: [INFO] op-svc Workpoint change (demanded/used): expCurr[m2

Nov 9 13:16:52 IFC: [INFO] op-svc Setpoint reached after 379ms, re-setting req

Nov 9 13:17:01 IFC: [INFO] op-svc Workpoint change (demanded/used): expCurr[m2

Nov 9 13:17:02 IFC: [INFO] op-svc Setpoint reached after 446ms, re-setting req

Nov 9 13:17:04 IFC: [NOTE] statistics \*\*\*\*\* Last exposure #2

Nov 9 13:17:05 IFC: [NOTE] statistics Shutdown Reason: ITF,1,0 (type=1) Temp:

Nov 9 13:17:05 IFC: [NOTE] statistics Statistics: HV[kV]=50.0(set)/1.5/50.1, (

Nov 9 13:17:05 IFC: [NOTE] statistics Statistics: expTime[s]=26.0/0.0, foc=Ia

Nov 9 13:17:05 IFC: [NOTE] statistics \*\*\*\*\* Last exposure #

Nov 9 13:17:05 IFC: [INFO] op-svc 1[ms] from operating status 'HV-Operation' t

Nov 9 13:17:05 IFC: [NOTE] op-svc HVPS Ready

Fig. 7: Reports

Web UI Manual

15

## 6.1 Download

### 6.1.1 Download all reports

This will download all three reports sequentially.

### 6.1.2 Diagnostic report

It will create a diagnostic report. The diagnostic report will collect data (syslog, config, ...) from the generator and put it in the diagnostic file. The diagnostic file is used from Comet to support customers.

### 6.1.3 Operational report

It will generate a report with a summary of current conditions about the iVario generator and create a PDF file. The file is stored in the Download folder of the Browser.

### 6.1.4 Operational report history

Downloads a zip file containing the operational system log file.

## 6.2 Event log

On the lower section of the page, you will find the log messages from the iVario generator. It shows the last couple of lines of the newest log messages and will capture all new log messages of the iVario generator until it has been paused with the button "Pause". New log messages are added to event log after the button "Play" has been pressed. To improve the overview in the amount of log messages it is possible to deactivate (button will turn gray) predefined filters. The number next to the filter name indicates how many log messages are available in the window of the specific type.

- ERROR
- WARNING
- INFO
- OTHER (all messages without ERROR, WARNING, INFO)

Further it is possible to show only log messages with a customized text, by entering the field "Filter...". Confirm the given text by clicking on the search icon and only messages with the desired message will appear in the event log. The rectangle right to the event log window helps to navigate through the large amounts of log messages. The gray represents the entire logs, and the blue represents shown lines in the text field. In addition, you get the warnings in yellow and errors in red. With one click to the specific bar it will show the appropriate section.



# 7 Service operation

This page is specially designed for service users and provides further functionalities for defect analysis of the iVario generator. The first part has the same layout as the normal HV Operation page and provides the same functionality.

## 7.1 Testing

### Testing

Filament Check

☐ Override Filament Control  
Disable Filament Check on next HV-On

---

Cycle Test

On Time

20 s

Off Time

10 s

Including Prewarm-Time

Cycles

10

Test Duration:

00:04:50

☒ Abort Test upon irregular Shutdown

Start Cycle Test

Last Log:

---

HV Range Test

Start Point

20 kV

End Point

160 kV

Sweep Time

100 s

Number of Steps

10

Test will increase voltage by 14 kV each 9.09 s.

Start Range Test

Last Log:

---

Value Switching Test

Point A

20 kV

1 mA

15 s

Voltage of Setpoint A

Current of Setpoint A

Duration of Setpoint A, including Ramping. Set to 0 for infinite Duration.

Point B

150 kV

5 mA

10 s

Cycles

10

Choose 0 for infinite

Test Duration:

00:04:10

☒ Abort Test upon irregular Shutdown

Start Value Switching Test

Last Log:

---

## Configuration Reset

Reset to Default

Loads the default configurations values and reboots automatically. After the reboot you have to reconfigure the HVPS.

Reset

Fig. 8: Service operation: testing

### 7.1.1 Filament check (not required for Mesofocus)

By activating the check box “Override Filament Control” the filament check is bypassed.

### 7.1.2 Cycle test

The iVario generator is driving HV for the configured “On Time” and pausing as long as the “Off Time” is set. This procedure is repeated as many times as cycles are set. When pressing on the “Start Cycle Test” a page overlay and all necessary operational parameters will be shown. In addition, the log window will provide further details. A test summary will be displayed at the end of the performed cycles.

### 7.1.3 HV range test

With this test it is possible to increase the HV set point in a defined interval until it reaches the end value “End Point”. In case of the step size, the interface calculates the other parameter automatically as well as the number of steps. The “Sweep Time” indicates the duration of the test until the summary is displayed. During the test cycles the operational data is displayed as on the cycle test.

### 7.1.4 Value switching test

The service user can define two working points for the iVario generator and how long it shall remain on each. With the desired cycles it calculates the duration and automatically performs the entire test once “Start Value Switching Test” is clicked. New page overlay appears and provide operational values to the user as well as the option to jump to the opposite working point.

## 7.2 Configuration reset

### 7.2.1 Reset to default

All configuration data as indicated above the button “Reset” will be set the iVario generator default values. “Reset to Default” is not the same as a factory reset as it will take the default values from the installed SW version.

# 8 Generator setup

Operation

Generator Info

HV Operation

Reports

Software Update

Service Operation

Setup

Generator

I/O

Communication

Application

comet

Normal Operation Mode

ser

Generator Setup

Date and Time

Generator Time:

Fri, 05 Apr 2024 09:07:58

Set Time Manually:

YYYY.MM.DDhh:mm:ss

Apply

Set Time Automatically

Sync with Computer

This will synchronize the clock of the Generator with the time of your computer.

Tube and Cable

Tube

MXR-225/26

Tube Serial Number

0000012

Cable Length

5

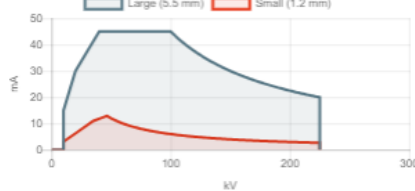
m

Apply

MXR-225/26

Large (5.5 mm)

Small (1.2 mm)



Material Number: 915386.51

Note: Diagram shows tube limits

Tube Data-Set Install

Upload and install a tube data-set package

Select Data-Set

Upload and Install Package

Reset Tubes to Release

Resets the tube data-set to the software release state

Reset to Release

Configuration

Export

Exports the current generator configuration to a file that is directly downloadable.

Export

Import

Importing a configuration will stop the generator and is rebooting at the end.

Choose Config File

Import

Reboot

Reboot

A reboot is necessary to apply the configuration.

Fig. 9: Generator page iVario-225

Web UI Manual

19

## Operation

Generator Info  
HV Operation  
Reports  
Software Update  
Service Operation

## Setup

Generator

I/O

Communication

Application

# Generator Setup

## Date and Time

Generator Time:

Fri, 05 Apr 2024 09:13:34

Set Time Manually:

YYYY.MM.DD



hh:mm:ss



Apply

Set Time Automatically

Sync with Computer

This will synchronize the clock of the Generator with the time of your computer.

## Tube and Cable

Tube

MXR-225MF

Tube Serial Number

1178531

Cable Length

5

m

Apply

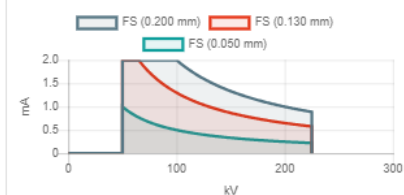
Tube Parameter File

Import a Tube Parameter File

Import

The tube parameter file contains the specific operation parameters for the MesoFocus tube. A unique file is delivered with each MesoFocus tube and must be loaded when the tube is installed.

## MXR-225MF



Material Number: 915427.50

Note: Diagram shows tube limits

## Tube Data-Set Install

Upload and install a tube data-set package

Select Data-Set

Upload and Install Package

## Reset Tubes to Release

Resets the tube data-set to the software release state

Reset to Release

# Configuration

## Export

Exports the current generator configuration to a file that is directly downloadable.

Export

## Import

Importing a configuration will stop the generator and is rebooting at the end.

Choose Config File

Import

# Reboot

## Reboot

A reboot is necessary to apply the configuration.

Reboot

Fig. 10: Generator page iVario-225MF

### 8.1.1 Data and time

Set the time either manually or synchronized with the connected computer

### 8.1.2 Tube and cable

Select the correct tube and enter the tube serial number as well as the correct cable length. Follow those steps to setup an iVario generator:

1. Chose connected tube type
2. Enter correct serial number from the tube
3. Choose connected cable length
4. Press "Apply"
5. Import a Tube Parameter file (only for Mesofocus)
6. Press "Import"
7. Press "Reboot"

### 8.1.3 Tube data set install

To use a tube that is not part of the default tube files. The user can upload and install a tube data set. During installation of the tube data set the default tubes will be removed. After successful installing a tube data set the generator will reboot. After that the user must select a tube for operation.

## 8.2 Reset tubes to release

If a user wants to get back the default tube files, he can press the "Reset to Release" button. The installed tube data set is deleted, and the default tubes will be restored.

## 8.3 Configuration

### 8.3.1 Export

Export feature is useful to get the customer configuration back without missing any settings at the end of a service case. It gets a „iVario-Config-Export.tar.gz“ file where all current iVario generator configuration data is stored. Contains following data:

- I/O configuration
- Generator setup settings
- Communication
- Serial numbers
- Tube files
- Tank files
- Cable file
- Application configuration
- Serial numbers
- Installed Tube Data Set

### 8.3.2 Import

In case the configuration data is extracted, it is possible to load the entire set with this feature. Simply load the file and click "Import" where the iVario generator will automatically reboot. After the restart the iVario generator is configured with the set of parameters that were stored in the file.

# 9 I/O configuration

This page is used to configure the behavior of outputs 1-6 (whereas output 5 and 6 are on the optional panel), warning lights 1-4 (whereas warning light 4 is on the optional panel), the optional panel and auto start cycle. Mesofocus does not support the optional panel.

Operation

Generator Info

HV Operation

Software update

Reports

Service Operation

Setup

Generator

I/O

Communication

Application

Normal Operation Mode

ser

I/O configuration

General

Use Optional Controller

Ignore HV Enable Button of X8

Apply

Phase Selection

With the following settings the I/Os can be mapped to the phases of the HVPS:

- ON: Steady switched ON in selected phase
- Blink: Blinking selected phase

Phase	Output 1	Output 2	Output 3	Output 4	Warn. Light 1	Warn. Light 2	Warn. Light 3	Dyn. Mon.
Enable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NOT-READY	Off	Off	Off	Off	Off	Off	Off	Off
COOLER CHECK	Off	Off	Off	Off	Off	Off	Off	Off
SAFETY READY	Off	Off	Off	Off	Off	Off	Off	Off
MAINS CHECK	Off	Off	Off	Off	Off	Off	Off	Off
READY	On	Off	Off	Off	Off	Off	Off	Off
PREWARN	On	On	Off	Off	Off	Off	Off	Off
HV ON	On	Off	On	On	Blink	Off	Off	Off
SETPT REACHED	On	Off	On	On	Blink	Off	Off	Off

Advanced Configuration

Apply Changes

Apply

Reset All

Discard Changes

Blink Period

The On- and Off-times for blinking are used for all blinking I/Os.

Blink on time

500 ms

Blink off time

500 ms

Apply

Current Monitoring Thresholds

The current monitoring thresholds are used for a correct detection if an I/O is correctly switched.

Start auto configuration

Light	off threshold	on threshold	shortcircuit threshold
Warning light 1	40 mA	40 mA	220 mA
Warning light 2	40 mA	40 mA	220 mA
Warning light 3	40 mA	40 mA	220 mA

Apply

Dynamic Monitoring

This input is able to monitor magnetic switches and the failure contacts from external warning lights.

Failure mode contact logic:

- Normally open  
(multiple failure mode contacts may be connected in parallel)
- Normally closed  
(multiple failure mode contacts may be connected in series)

Dynamic Monitoring feedback timeout

120 ms

Apply

Reboot

A reboot of the device is necessary to apply the configuration.

Reboot

Fig. 11: I/O configuration

## 9.1 General

- The optional iVario Controller requires the check box to be active if the warning light, the key switch, output 5 and output 6 shall be operational.
- If the check box “Ignore HV Enable Button of X8” is checked, the start button is no longer required to be pressed before driving HV. This is used if the iVario generator is integrated in another machine and the signal to start HV operation is requested via the communication interface (ex. iVario Control, iVario Controller).

## 9.2 Phase selection

The I/Os (Output, Warning Lights and Dynamic Monitoring) can be mapped to the phases of the HVPS:

- ON: Steady switched ON in selected phase
- Blink: Blinking selected phase

It is required to enable each I/O individually. Before the settings are valid it is required to press the “Apply” button.

## 9.3 Blink period

The configured time values will be valid for all warning lights (and dynamic monitoring) where the phase “Blink” has been selected in chapter 9.2.

## 9.4 Current monitoring thresholds

Setting the three threshold values is possible by simply pushing the button “Start auto configuration”. It will trigger a measurement procedure for the three warning lamps (each will flicker once) and set the values based on the connected feedback. Further it is possible to set each value by the operator or to adjust the returned values.

Following rules are valid:



- OFF threshold is below the ON threshold
- Shortcut threshold is above the ON threshold


## 9.5 Dynamic monitoring

In this section it is possible to change the connection logic for dynamic monitoring as well as the timeout until feedback is required (impact to configuration of subcategory “Output Configuration” part Dynamic Monitoring).

# 10 Communication configuration

Multiple communication interfaces are available on the IFC platform, and the corresponding parameters are configurable on this page. Two interfaces are physically integrated on the iVario generator. Ethernet works through the TCP/IP protocol and the serial connector with the MG or T3 protocol.

**c•met**  

Normal Operation Mode  ser

**Operation**  
Generator Info  
HV Operation  
Reports  
Software Update  
Service Operation

**Setup**  
Generator  
I/O  
**Communication**  
Application

## Communication Configuration

**Network**

☐ DHCP enabled

IP

192.168.177.150

Netmask

255.255.255.0

Gateway

192.168.177.1

DNS Server

10.33.160.8

Apply

**Remote Control**

☐ Single Master

Default Master

TCP port 50505

Apply

**Guarded Communication**

☐ Enable the watchdog feature on the communication level

The "Guarded Communication" feature requires to receive a periodically key to keep the high voltage generation alive. If the key is not received within the specified period and a time out occurs, the selected action will be taken.

- Tolerant Mode: High Voltage is switched off
- Restrictive Mode: High Voltage is switched off and a not ready condition is set

You will find additional information in the manuals.

Interface	TCP port 50505	TCP port 50506	Serial Port
Mode	Disabled	Disabled	Disabled
Timeout			

Apply

**Serial**

☐ Expand

**Legacy MG Protocol**

☐ Expand

**Reboot**

A reboot is necessary to apply the configuration.

Reboot

Fig. 12: Communication configuration

## 10.1 Network

To set up a communication through ethernet it is required to set the network parameters according to the values from the network to which the iVario generator is connected.

Default settings:

- DHCP enable      inactive
- IP:                      192.168.177.199
- Netmask:              255.255.255.0
- Gateway:              192.168.177.1
- DNS server:           192.168.177.1



After entering the configuration, the iVario generator does require to confirm by pressing “Apply”. New values are only valid after a restart.

## 10.2 Remote control

- *Single master:*  
If active it is only possible to send commands/keys (write type) via master (if not registered it will take the default master).
- *Default master:*  
Select a default master in case the single master mode is active, and no remote controller is registered as master.

## 10.3 Guarded communication

If enabled, this sets the guard-mode for the given interface. On guarded interfaces, the client has to send the keep-alive key (GRDKA) on regular basis and within the timeout, or action is taken depending on the mode set. There are three modes:

- **DISABLED:** the feature is disabled for this interface.
- **RESTRICTIVE:** when this mode is configured on an interface, the connected client has to send the keep-alive t3 protocol keys (GRDKA) periodically, otherwise the generator will set a not-ready code and will therefore not be able to start generating high-voltage. If the generator is already generating high-voltage, it will switch off and then set the not-ready code. The system gets ready as soon as all needed clients are back online. This should be the default mode if the guard is enabled.
- **TOLERANT:** in this mode, as soon as a client sends the keep-alive key (GRDKA) periodically, it will be guarded. If the generator is generating high voltage, it switches off when the client stops sending the keep alive. But the generator will not require the client to send the keep-alive key again, to switch on the next time.

Note: When using the guarded communication on the serial interface, make sure the serial protocol is set to T3. If the MG protocol is set, the guarded communication setting for the serial port is ignored.

## 10.4 Serial

- **Bitrate:** rate in bit/s
- **Protocol:** MG (old generator platform) protocol or T3 protocol, available only on iVario, not on Mesofocus.

## 10.5 Legacy MG Protocol

Specific settings from the MG protocol are possible to activate to fit system specific versions of the MG protocol in existing machines. All sent keys P<XX> (see legend below) are persistently changed in the data server.

Legend:

P99: Special key to include MG features (Programmplatz 99) but does not exist in the old MG protocol. Set the persisted voltage for UU/UD fast voltage step on MG (T3 key MGP99 provides more details) but only through the iVario Controller (not through other interfaces).

PE: Set to activate the automatic message after reaching the state "Ready". Output if active:

- X1 (ready)
- X0 (not ready)

PF: Activate the automatic message after changing the focal spot. (F0 is the large focus/ F1 is the small focus).

PM: Set to activate automatic output of the mode after change (410/411 as normal mode with the control unit and 400/401 as remote-controlled mode)

PN: If selected, the automatic output of the last 5 digits from the EPROM number code after mains ON, is active.

PQ: If selected, a response for each input is given even if the value would not be acknowledged.

# 11 Application configuration

The text boxes allow entering a parameter and below the current limit of the iVario generator is visible. The units can be different (between entered value and current valid iVario generator value) as it is calculated out of iVario generator settings and application settings by the SW (e.g., required slope to achieve a certain response time).

## 11.1 Settings

Global Parameters for the iVario generator can be configured according to requirements from the application in which the iVario generator is operating.

The screenshot shows the 'Application Configuration' settings page. On the left is a sidebar with a menu: 'Operation' (Generator Info, HV Operation, Reports, Software Update, Service Operation), 'Setup' (Generator, I/O, Communication), and 'Application' (highlighted). The main area is titled 'Application Configuration' and 'Settings'. A note states: 'The following settings are independent of the generator configuration calculation. After applying new values a reboot is required.' The settings are organized into sections: 'Prewarning' (Regular prewarn time: 5 s, Prolonged prewarning: Customer Interlock 1 or 2 was o, Prolonged prewarn time: 10 s), 'Cooler' (Regular post-cooling time: 60 s, Emergency post-cooling time: 5 s, Cooler flow timeout: 10 s, Check cooler flow transition: checkbox), 'Warm-Up' (Automatic switching: checkbox), 'Filament Control' (Auto Preheat: checkbox, Currently disabled, Preheat Timeout: 1800 s, Actual Limit: 1800 s), 'Initial Operation Parameters' (Initialization Mode: Use minimal values, HV Setpoint: 10 kV, Tube Current: 0 mA, Exposure Time: 0 s, Focal Spot: 5.500 mm), and an 'Apply Settings' button.

Fig. 13: Application configuration:setting

### 11.1.1 Prewarning

Defines the time between the iVario generator is switched ON and physically ramping up the voltage and current.

- Prewarning mode
  - Not enabled
  - Prolonged prewarn is enabled when custom interlock 1 has been opened
  - Prolonged prewarn is enabled when custom interlock 2 has been opened
  - Prolonged prewarn is enabled when custom interlock 1&2 has been opened
- Range: 0 – 3 [s]
- Regular prewarning time
  - In mode 0 this time is always valid even if customer interlock has been opened

between HV OFF and HV ON. This time is taken in case the custom interlock 1 or 2 was not open between switching HV OFF and ON again. range: 0 – 300 [s]

- Prolonged prewarning time

This time is valid in case the interlock 1 or 2 has been opened between the last HV ON and the actual request to switch the iVario generator to an operational state. Once the HV state could be reached successfully, the regular pre-warning time is valid again, until the next opening of the customer interlock. range: 0 – 300 [s]

### 11.1.2 Cooler

- Regular post-cooling time

If the iVario generator is switching into the state NOT READY (e.g., safety or customer interlocks are opened), the cooler will be switched off after the defined time. range: 10 - 3'600 [s]

- Emergency post-cooling time

This value is valid in case of an emergency stop and does switch off the cooler after the defined value. range: 0 – 4294967295 [s] (default is 5)

- Cooler flow timeout

This time does define how long it can stay in the status “Cooler Check” before the iVario generator falls back into the “Not Ready” state. The value offers the option to connect all different kind of coolers and the one with slow feedback from the cooler flow sensor. range: 1 – 10 [s]

- Check cooler flow transition

This checkbox selects a cooler flow check on transition. If selected, then cooler flow input signal must show a transition from open to closed when the cooler ON output signal is switched on. If not selected, then the cooler flow input signal must be closed when the cooler ON output signal is on (but no transition needed).

### 11.1.3 Warm-Up

- Automatic switching

If this feature is activated, it is required in certain conditions to run the warm-up before it is possible to turn HV on.

### 11.1.4 Filament control (not for Mesofocus)

- Auto Preheat

If active, the iVario generator does fulfill possible check after MAINS is ON and will allow a faster change into the HV operation state once the start button is pressed.

- Preheat Timeout

To protect the tube, the preheat current must be switched OFF after a long time in standby (without operation). range: 300-1800 [s]

### 11.1.5 Initial operation parameters

This setting controls the operation parameters which are set after a reboot of the generator. The operation values are the exposure time, the selected focal spot, the high voltage and the tube current.

- Use minimal values

After a reboot, the minimal values for high voltage and tube current are set. The focal spot is set to “large” and the exposure time to zero.

- Use configured values  
A set of values for the operation parameters can be configured below. After a reboot, these values are loaded.
- Use auto saved values  
The system keeps the last used operation parameters after a reboot. The values are stored every time the system enters the HV-off state. Therefore, you have to start HV at least once for new values to be saved.

## 11.2 Additional limits

It allows changing global valid limits for the iVario generator that may be necessary to meet physical requirements. Can be the case due regulatory restrictions in which the iVario generator has to operate.

### Additional Limits

The additional limits and are included in the generator configuration calculation, however the most restrictive limit will be used. After applying new values a reboot is required.

High Voltage	HV Max	HV Min	
	<input type="text" value="650"/> kV	<input type="text" value="10"/> kV	
	Actual Limit: 225.00,225.00 kV	Actual Limit: 10.00,10.00 kV	
	Switch-On Time	Switch-Off Time	
	<input type="text" value="3"/> s	<input type="text" value="300"/> ms	
	Actual Limit: 75.0 kV/s	Actual Limit: 0.30 s	
	Ramp-Up Time	Ramp-Down Time	
	<input type="text" value="300"/> ms	<input type="text" value="300"/> ms	
	Actual Limit: 750.00 kV/s	Actual Limit: 750.00 kV/s	

Tube Current	Current Max	Ramp-Up Time	Ramp-Down Time
	<input type="text" value="50"/> mA	<input type="text" value="300"/> ms	<input type="text" value="300"/> ms
	Actual Limit: 15.0,12.9 mA	Actual Limit: 50.00 mA/s	Actual Limit: 50.00 mA/s

Filament	Filament Current Max	Filament Current Min
	<input type="text" value="10"/> A	<input type="text" value="0"/> A
	Actual Limit: 4.20,3.80 A	Actual Limit: 0.00,0.00 A

Power	Power Max
	<input type="text" value="10000"/> W
	Actual Limit: 2250.0,600.0 W

Apply Limits

### Reboot

Reboot

A reboot is necessary to apply the configuration.

Fig. 14: Application configuration: additional limits

### 11.2.1 High-voltage

- HV max  
Possible to define a maximal HV value of the iVario generator and this will act as a generator limit. It not possible to go above the iVario generator lowest default configuration value of configured component. It is useful to configure a lower application limit due to limitations from external operational parameters where the iVario generator is built in (e.g., cabinet, application, ...) Range: 0 to lowest max in configuration files [V] (tank, tube, cable, application).

- **HV min**  
Set a minimal HV value for the iVario generator after the HV ON command. If the value is not set to 0kV the generator will automatically generate the required voltage on the output after pressing the start button is pressed. Range: 0 – HV nom [V]
- **Switch-On Time**  
Defines the max time between the iVario generator is ramping from HVmin up to HVnom value. It corresponds to the delay between the “Prewarn” operating status to the “HV Operation” operating status. The iVario generator calculates the required HV slope to achieve the required time and shows the currently calculated iVario generator value on the right-hand side.
- **Switch-Off Time**  
Defines the time in which the iVario generator is ramping down from current HV value to 0kV. The iVario generator now calculates the required slope to reach the given time within the worst-case scenario (max HVmax of tank, cable, tube, or application).
- **Ramp-Up time**  
This parameter is used in case of a change to the operating point is required and the HV value need to be adapted to a higher value than existing. The parameter is calculated on basis of maximal possible differences in HV (0kV to HVmax – if it is a bipolar iVario generator the HV max is divided by 2).
- **Ramp-Down time**  
This parameter is used in case of a change of the operating point is required and the HV value must be adapted to a lower value than existing. The parameter value is calculated based on maximal possible difference in HV (HV max to 0kV – if it is a bipolar iVario generator the HV max is divided by 2).

### 11.2.2 Tube current

- **Current max [mA].**  
This value limits the maximal emission current unless another component owns a lower max limit (configuration parameter of tube, tank, or cable)
- **Ramp-Up time**  
Set the max time to reach any increased current value within the specified tolerances (0 to “Current max”). The iVario generator will calculate the required slope and use this number as a parameter.
- **Ramp-Down time**  
Set the max time to reach any required lower current value within the specified tolerances (0 to “Current max”). The iVario generator will calculate the required slope and use this number as a parameter.

### 11.2.3 Filament

- **Filament current max**  
Define the maximal possible filament current unless another component (tank, tube, cable) parameter does limit to a lower max value.
- **Filament current min**  
Define the minimal possible filament current unless another component (tank, tube, cable) parameter does limit to a higher min value.

### 11.2.4 Power

- Power max  
Defines the maximal power limit for the iVario generator if there is no other component (dependent on iVario generator settings and operational mode) to limit this value. Generator will use the most restrictive value between mA, kV and power limitation.
- Range:
  - unipolar: 0 - 2'250 with 1 POC | 0 – 4'500 [W] with 2 POCs
  - bipolar: 0 - 4'500 [W]

All limits need to be applied (press “Apply”) and limits become valid after a reboot.

#### **Europe & RoW**

COMET AG  
Herrengasse 10  
CH-3175 Flamatt  
Switzerland

T +41 31 744 90 00  
F +41 31 744 90 90  
service.xray.ch@comet.tech  
www.comet.tech

#### **USA**

COMET Technologies USA, Inc.  
100 Trap Falls Road Extension  
Shelton, CT 06484  
USA

T +1 203 447 31 65  
F +1 203 925 03 64  
service.xray.us@comet.tech  
www.comet.tech

#### **Asia**

COMET China  
1201 Gui Qiao Road  
Building 10, 1st floor  
Pudong, Shanghai 201206  
P.R.China

T +86 21 6879 9000  
F +86 21 6879 9009  
service.xray.cn@comet.tech  
www.comet.tech