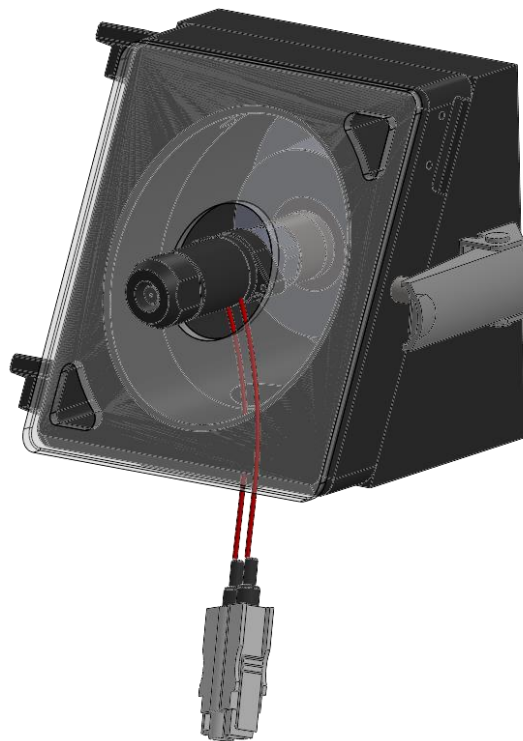


## Installation Manual

# SICRIT<sup>®</sup> Interface AX1/2

for Agilent LC-MS instruments



Release January 2020

This manual has to be stored carefully and must be at hand to any user of the described system. In addition to this guide, Plasmion GmbH provides the following installation manuals:

*Hardware and Operations Manual for SICRIT® SC-30X Ionization Set*

*Installation and Operations Manual for SICRIT® GC/SPME Module*







Attention! Please read and understand this manual before operating the described system. In case you discover obvious errors or contradictions for your product, contact the manufacturer before operating the system.

The content of this document has been checked thoroughly and is believed to be reliable. However, Plasmion GmbH does not assume any responsibility for damages of foreign or own products and instruments resulting from improper use or any combination of the product with other instruments. Plasmion GmbH is not liable for consecutive damages resulting from integration and/or operation of its products in/with other systems. If the system is used in any manner not specified by Plasmion GmbH, the protection of the system could be impaired. Plasmion GmbH is not responsible for ignoring the outlined safety guidelines or the misuse of this system.

The technology and application of the system described in this manual is covered by patents and patent applications and is used under license. All trademarks are property of their respective owners.

## Safety Instructions

The following safety labels on the product and within this manual indicate safety risks and necessary precautions that arise during installation or from operating the products.

	<p>[Attention!], marks possible dangers to your safety and health.</p>
	<p>[Dangerous Voltage!], indicates parts and situations where there is the risk of exposure to dangerous electrical voltages.</p>
	<p>[Attention Hot Surface!], indicates potentially hot surfaces that might cause burning injuries if touched without protective gear.</p>
	<p>[Note], marks important information or advice, not related to safety issues.</p>

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## 1. Intended Use of the SICRIT® MS Interfaces

The system described is intended for use only in laboratory and/or R&D environment. If the system is used in a way not specified by the manufacturer, misused or modified causing an infringement of the safety measures, Plasmion GmbH refuses any liability for consecutive damages in any form.

### 1.1 The SICRIT® Technology

Soft Ionization by Chemical Reaction In Transfer (SICRIT®) is a flow through ionization technique to be coupled with mass or ion mobility spectrometers. Inside the ion source a cold plasma is used for ionization of the analytes passing through. This enables direct gas phase measurements as well as coupling with chromatographic systems as GC or HPLC. The latter requires additional coupling modules.

### 1.2 The SICRIT® Interface AX1/2 for Agilent LC-MS instruments

The SICRIT® Interface AX1/2 replaces the standard ion source housing of the Agilent MS and enables the coupling of the SICRIT® Ion source to the MS (Fig. 1). The AX1/2 Interface consists of:

- an interlock fitting (a) with a plastic safety cover that enables the MS to detect the SICRIT® Ion source and protects the user during MS operation,
- an ion source adaptor-piece set including a special ceramic extension (b), an inlet adaptor (c), a source adaptor (d) and a fixing nut (e) to connect the inlet capillary inlet to the SICRIT® Ion source. AX1 and AX2 are identical except for the ceramic spacer. The AX2 spacer has 3 small boreholes for adaption to the higher inlet flow of hexabore resistive capillaries.

The interface enables the general connection of the SICRIT® Ion source to your Agilent MS. It also enables the mechanical connection of additional SICRIT® modules for coupling methods e.g. SPME-SICRIT®-MS, GC-SICRIT®-MS (please check for available products at [plasmion.de](http://plasmion.de))

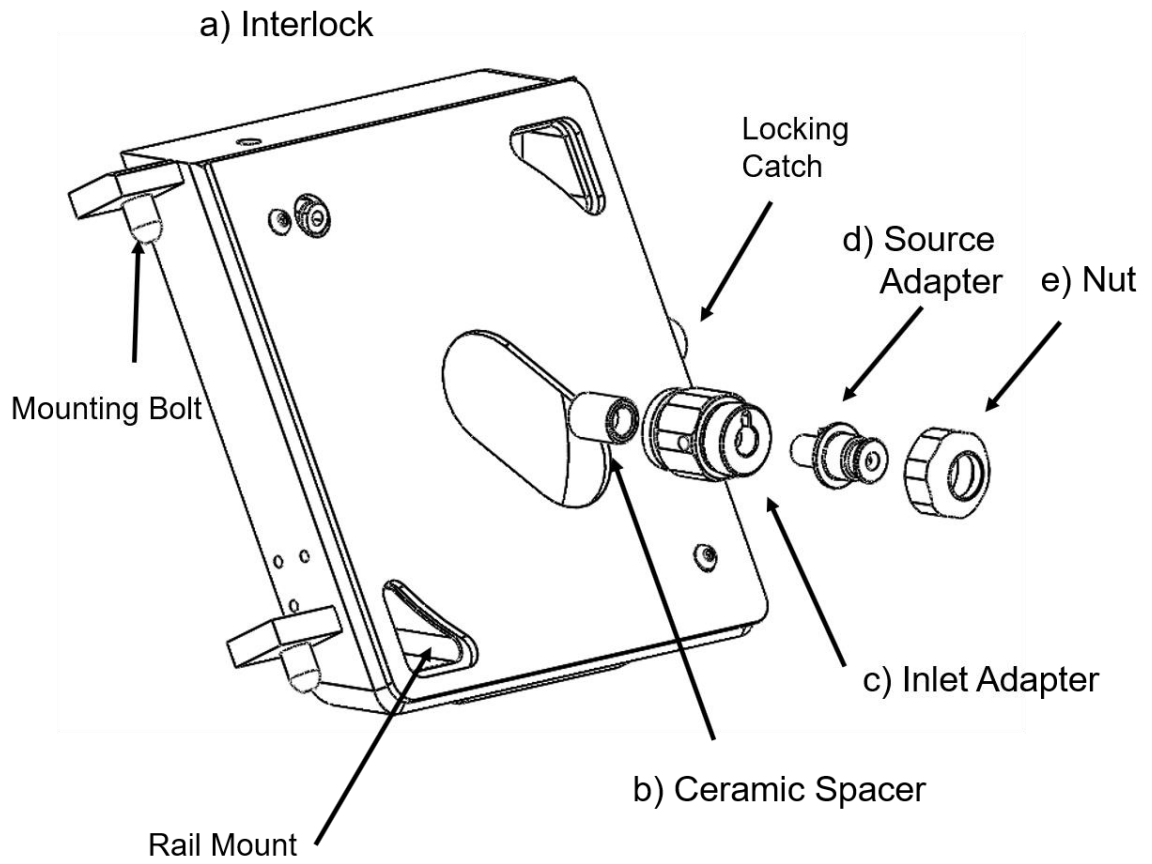




Figure 1: Components of the SICRIT® Interface AX1/2.

## 2. Installation of the SICRIT® Interface AX1/2 to the MS instrument

### 2.1 Steps before the installation of SICRIT® Interface AX1/2

Before the interface can be installed, the standard Agilent ion source has to be removed. Please follow the specific descriptions of the manufacturer of your MS.

	<p>Attention!</p> <p>Plasmion GmbH does not hold responsibility for potential damages that result from non-compliance to the manuals of the MS-manufacturer when removing the housing or other parts of the MS.</p>
	<p>Attention!</p> <p>Some parts of the MS interface can be very hot and cause burnings or injuries. Before performing the installation, let the system cool down, wear protective gear and refer to the instructions given in the respective MS manual.</p>

- Turn off the spray chamber and let the system cool down.
- Open the spray chamber and remove it from the LC-MS.
- Remove the spray shield, so the capillary end cap is exposed.
- Remove the capillary cap from the end of the capillary.

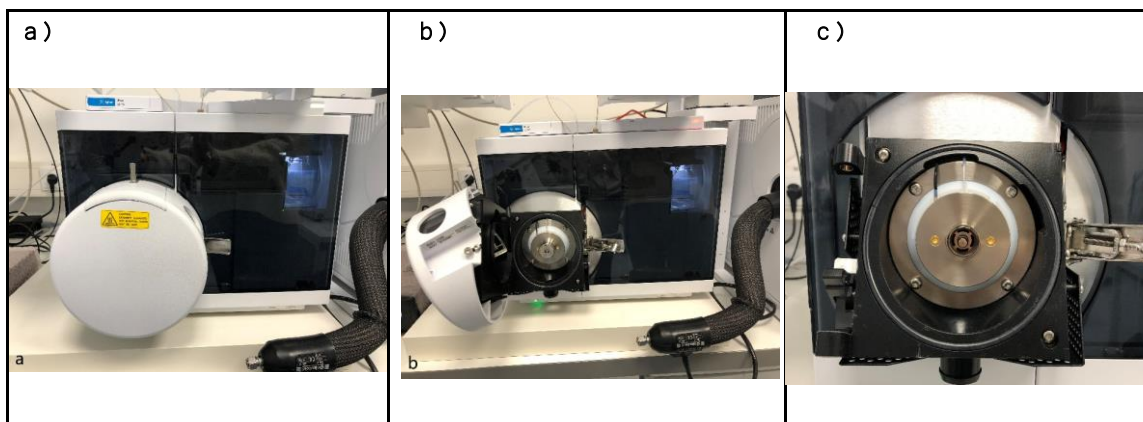


Figure 2: Closed electropray spray chamber (a), opened electropray spray chamber (b), Inlet with capillary cap (c).

## 2.2 Installation of the SICRIT® AX1/2 Ion source adaptor

For the operation of the SICRIT® Ion source the resistive capillary has to be connected directly with the SICRIT® Ion source adaptor by the following steps:

- Place the ceramic spacer on the resistive glass capillary (see Fig. 3). In case of AX2 make sure that the spacer is in correct orientation, having the side with the less deep bore facing towards you (see Fig 3 b).

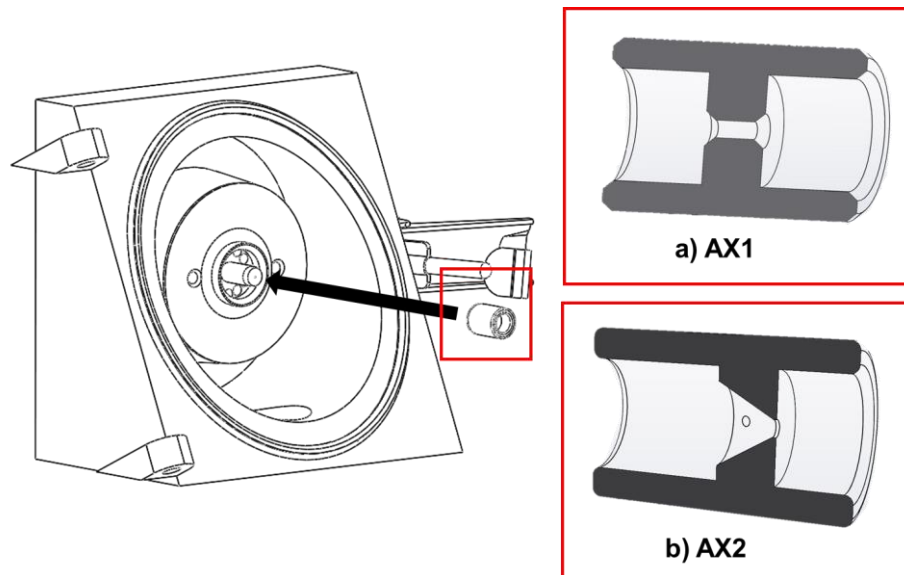


Figure 3: Installation of the ceramic spacer with orientation of a) AX1 and b) AX2 variant.

- Install the inlet adaptor over the ceramic spacer by screwing it clockwise into the spray shield thread (see Fig. 4). Do not tighten the adaptor yet.
- Mount the source adaptor onto the inlet adaptor. Make sure to guide the pin into the notch (see Fig. 5).
- Complete by installing the nut over the source adaptor by screwing it clockwise onto the inlet adaptor thread (see Fig. 5) and tighten the inlet adaptor. Do NOT use tools e.g., pliers to tighten the nut and tighten it only hand tight!



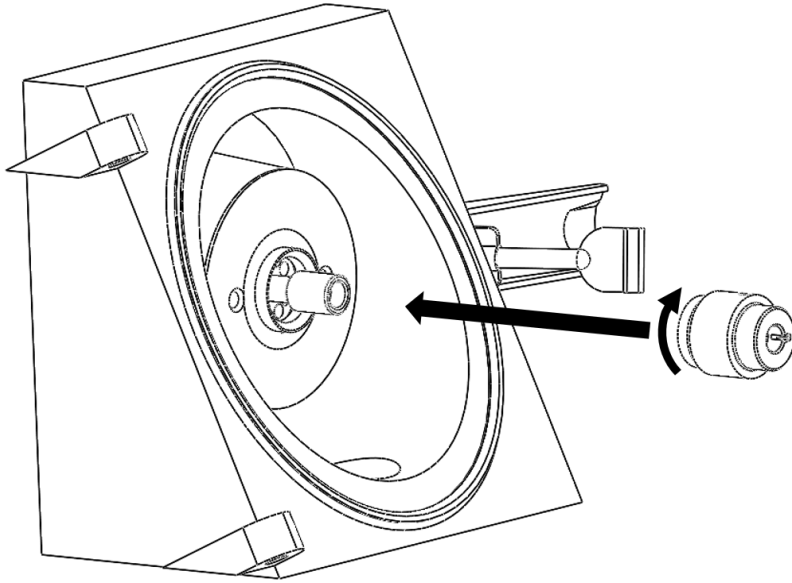


Figure 4: Installation of the inlet adaptor.

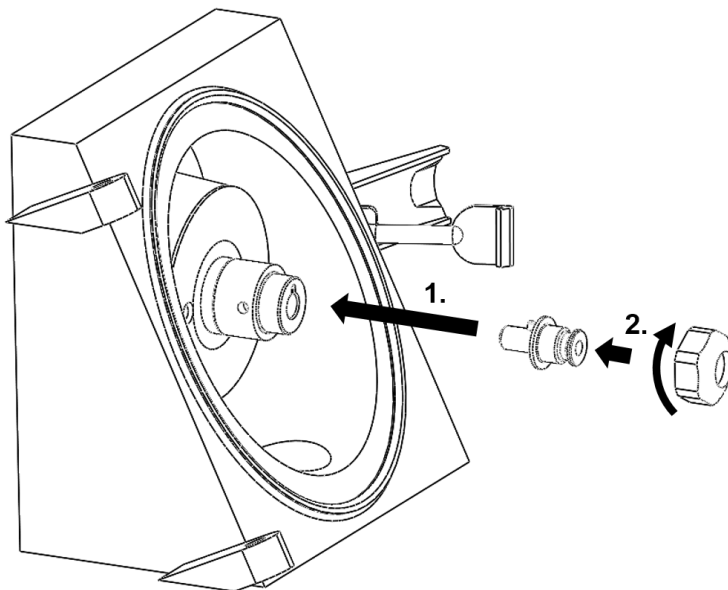


Figure 5: Installation of the source adaptor.



**Attention!**

Make sure that you tighten the nut hand tight! Do NOT use any tools to tighten the nut.

Overtightening might damage the resistive glass capillary!

### 2.3 Installation of the SICRIT® Ion source

After installation of the SICRIT® Ion source adaptor you can now mount the SICRIT® Ion source by means of the quick lock mount (Figure 6).

- Press the ion source gently onto the source adaptor.
- Firmly hold the source and rotate the lock about  $\frac{1}{4}$  turns clockwise, until you hear a “click” sound. This signalizes that the lock is engaged and mounting is finished.

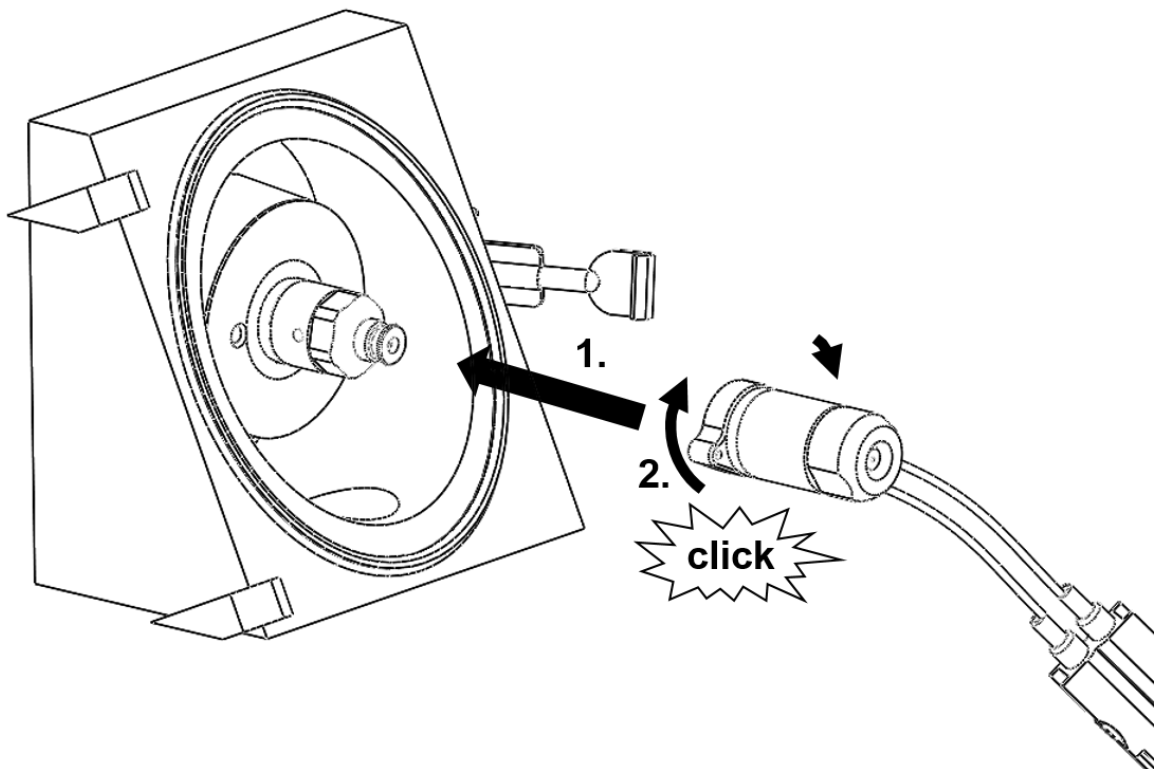


Figure 6: Installation of the SICRIT® Ion source.



On new sources the locking might require some force. The locking mechanism becomes easier after a few installations.

## 2.3 Installation of the SICRIT® Interlock

After mounting of the SICRIT® Ion source, install the provided SICRIT® AX1/2 Interlock before operation of the ion source as following:

- Hook on the interlock by placing the mounting bolts in the guides of the MS (see Fig. 7).

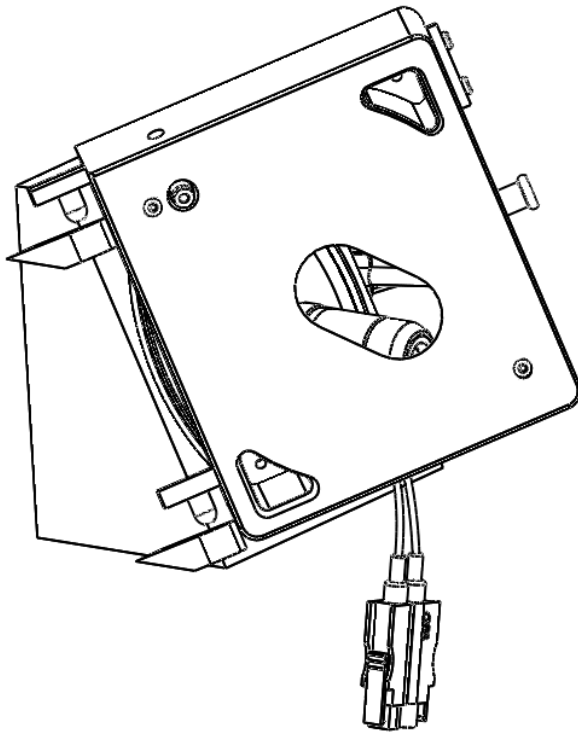


Figure 7: Hooking of SICRIT® Interlock on the MS interface.

- Move the red HV cables of the ion source through the cutouts while closing the interlock. Make sure not to jam the cables!
- Lock the interlock by closing the locker over the catch on the interface (see Fig. 8).



### Attention!

Make sure not to jam the red HV cables while closing the source! Use the provided cutouts (see Fig. 9). Avoid bending the cables (minimal bending radius is 4 cm). Do not place the cables over sharp edges or hot surfaces. Avoid strain on the cables and use strain relief measures.

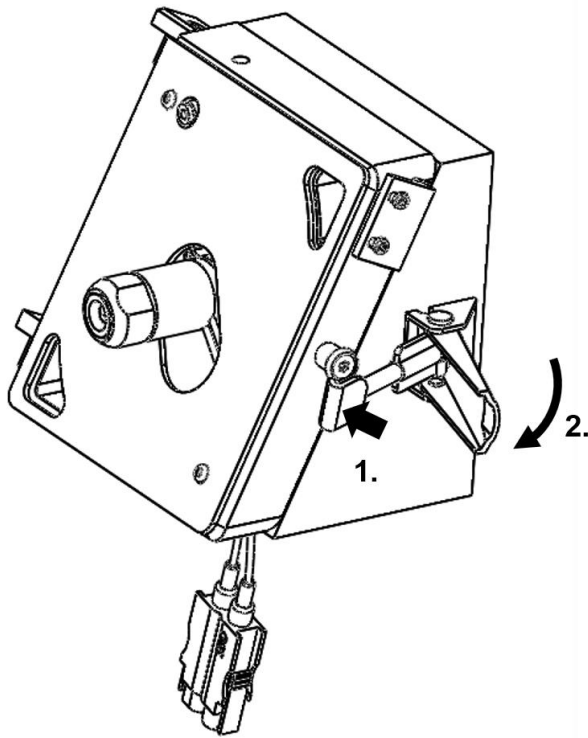


Figure 8: Closing the Interlock.

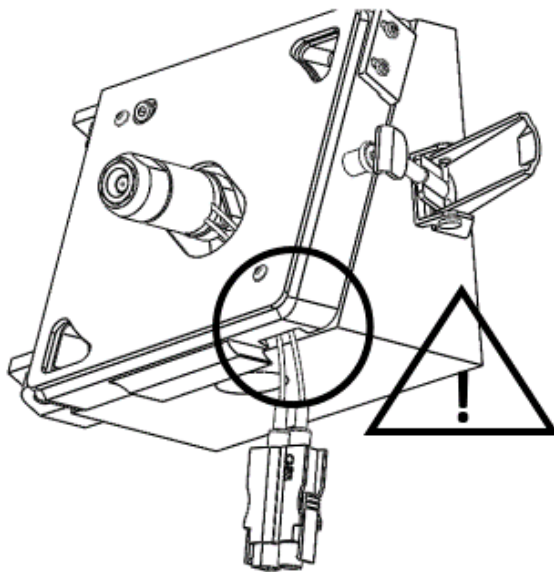


Figure 9: Cutout for ion source cables.

Further information about the intended use of the SICRIT® Ion source and the implementation of SICRIT MS-measurements or measurements with coupling of GC or SPME can be found in the corresponding manuals of Plasmion GmbH.

## 2.4 Installation note for older Agilent instruments (e.g. MSD 6110)

To achieve recognition by the Agilent software it might be necessary to unscrew the iButton of the original ESI source and hold it down on the iButton reader, while closing the SICRIT® Interlock. After recognition is finished, the iButton is not necessary for operation, as long as the interface stays closed. However, the SICRIT® Interlock provides boreholes to mount the iButton direct onto the interlock (see Fig. 10).

Note: Recognition usually takes up to 15 seconds and might need several tries opening and closing the interlock door.

a)



b)



Figure 10: iButton on original ESI Source (a); iButton on the SICRIT Interlock (b).

### 3 Launching the MS instrument with SICRIT® Ionization Technology

	If the system is used in a manner not specified by the manufacturer, the warranty of the manufacturer may be impaired.
	If you do not use/restrict the nebulizer flow (e.g. GC/SPME Module), close of the gas line with a proper fitting, else the instrument might not achieve the required readbacks to get “ready” state.

#### 3.1 Mass Hunter Software-Settings for operating SICRIT® Ion Source

After installation of the interlock the SICRIT® Ion source select following set parameters in the MS software:

- Select ESI as ionization source in the “General” tab of the software.
- Switch to “Source” tab and use the recommended settings according to Tab. 1 (see Fig. 10).

*Table 1: Recommended source settings for SICRIT® ionization*

Setting	Recommended Values
Drying Gas Temperature	250 °C- 300 °C
Drying Gas Flow	3-12 l/min
Nebulizer	0 psi (except if used for GC-SPME Module)
VCap	0-1000 V (usually 0 V)
Nozzle Voltage	0 V
Fragmentor	150-250 V

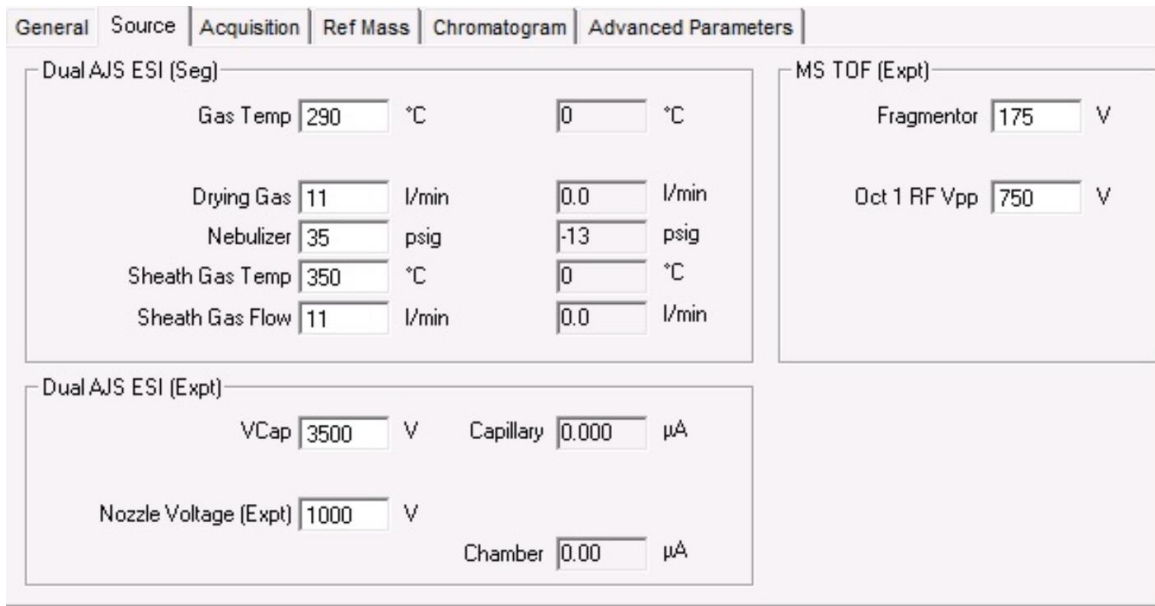


Figure 11: Source tab with parameter settings of Agilent Mass Hunter Software.

### 3.2 ChemStation Software–Settings for operating SICRIT® Ion Source

After installation of the interlock and the SICRIT® Ion source, select ESI as ionization source in the Method editor. Use similar settings (if applicable) as listed in Table 1



Figure 12: Method editor of Agilent ChemStation Software.

## 4 Service and Maintenance

### 4.1 Maintenance of the SICRIT® AX1/2 Interface

We recommend cleaning the adaptor periodically to avoid the formation of contaminations in form of deposits and to ensure an optimum performance of the ion source. For disassembly follow the steps described for installation in reverse order:

- Put your MS to standby mode and let the *spray cone* cool down.
- Turn off the high voltage at the SICRIT control unit.



Attention!

Ensure the MS instrument is in standby and HV is turned off at SICRIT HV supply before continuing.

- Disconnect the HV cables.
- Unlock the lever of the SICRIT® Interlock and take off the interlock carefully.



Attention!

All parts of the adaptor including spacer might be very hot!  
Let it cool down first and wear appropriate protective gear.

- Dismantle the ion source turning the lock counterclockwise.
- Loosen the nut and take out the source adaptor.
- Unscrew the inlet adaptor and take of the ceramic spacer.

### 4.2 Cleaning the SICRIT® Interface parts

Follow the procedure below to clean the SICRIT Interface parts:

- Use an ultrasonic cleaning bath to clean stainless steel and ceramic adaptor parts (not the interlock!) for 15 min in a 50:50 methanol/water mixture. Use only LC-grade solvents or better.
- If necessary, clean the interlock and protective window using a moist linen tissue.
- Make sure all parts are dry and clean before reinstallation.