

Translation of the Original

# CU1000

Bedieneinheit

Catalog No.:  
560-320

from software version:  
2.41 (LDS3000) / 2.41 (CU1000)

jina54en1-04-(1604)



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# 1 About these instructions

## 1.1 Target groups

These operating instructions are intended for the owner and for technically qualified personnel with experience in leak detection technology and integration of leak detection devices in leak detection systems. In addition, the installation and use of the device require knowledge of electronic interfaces.

## 1.2 Other associated documents

Mass spectrometer module operating instructions	jiqa54
Operating instructions bus module	jiqb10
Operating instructions I/O module	jiqc10
Protocol Descriptions	jira54

## 1.3 Warnings



### DANGER

Imminent threat resulting in death or serious injuries



### WARNING

Hazardous situation resulting in potential death or serious injuries



### CAUTION

Hazardous situation resulting in minor injuries

### NOTICE

Hazardous situation resulting in damage to property or the environment

## 2 Safety

### 2.1 Intended use

The unit is intended for querying and configuring the data of the mass spectrometer module LDS3000.

- ▶ Install, operate and service the unit only in compliance with these instructions.
- ▶ Maintain the application limits (refer to Chapter 4.3, page 10).

### 2.2 Owner requirements

#### **Safety conscious operation**

- ▶ Operate and install the device only in technically perfect working order and as specified, in a safety-conscious and hazard-conscious manner and in compliance with these instructions.
- ▶ Fulfill and ensure compliance with the following regulations:
  - Intended use
  - Universally valid safety and accident prevention regulations
  - International, national and local standards and guidelines
  - Additional device-related provisions and regulations
- ▶ Use only original parts or parts approved by the manufacturer.
- ▶ Keep this manual available at the operating site.

#### **Personnel qualifications**

- ▶ All work must be performed only by technically qualified specialists who have been trained on the device.
- ▶ Allow personnel in training to work on the device only under the supervision of technically qualified specialists.
- ▶ Make sure that the authorized personnel have read and understood these instructions and all other applicable documents (refer to "Other associated documents"), especially the information on safety, maintenance and repairs, before starting work.
- ▶ Define responsibilities, authorizations and supervision of personnel.

### 2.3 Operator requirements

- ▶ Read, observe and follow the information in these instructions and the working instructions created by the owner, especially the safety instructions and warnings.

## 3 Shipment, Transport, Storage

### Shipment

Item	Quantity
Control unit	1
Touch PIN	1
Operating instructions	1

- ▶ Please check the scope of delivery of the product for completeness after receipt.

### Transport

#### NOTICE

##### Damage due to unsuitable packaging material

Transport in unsuitable packaging material can damage the device.

- ▶ ▶ Transport the device only in the original packaging.
- ▶ ▶ Keep the original packaging.

### Storage

- ▶ Store the device taking into consideration the technical data, refer to Chapter 4.3, page 10.

## 4 Description

### 4.1 Device setup

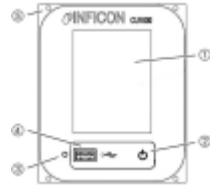


Fig. 1: Front view

1	Touchscreen	4	USB port
2	Status LED	5	Mounting holes
3	Rest button		

#### Status LED

Status LED illuminated	Control unit operates normally
Status LED flashing	Display is set to power saving mode

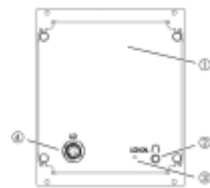


Fig. 2: Rear view

1	Rating plate with control unit	3	Calibration button for calibrating the touch screen (LCD-CAL), can be operated with touch PIN
2	Connection for headphones	4	Connection for the cable to the leak detector (LD)

### 4.2 Function

You can use the control unit to configure the mass spectrometer module LDS3000. It also lets you output the data stored in the MSB box.

### 4.3 Technical data

#### Mechanical data

	CU1000 Display unit
Dimensions (lxwxh)	106,2 mm x 128,4 mm x 49,2 mm

#### Electrical data

	<b>CU1000 Display unit</b>
Memory capacity for measured data	16 MB

## Ambient conditions

	<b>CU1000 Display unit</b>
Max. altitude above sea level	2000 m
Max. relative humidity above 40 °C	50%
Max. relative humidity from 31 °C to 40 °C	80% to 50% (linear abfallend)
Max. relative humidity to 40 °C	80%
Max. storage temperature	-20 °C - 60 °C
Pollution degree	II



## 5 Installation

### 5.1 Connecting the control unit

Establish connection of "LD" of the control unit and "Control Unit" of the MSB box with the data cable.

The data cable on the control unit can also be connected or removed during operation.

- ▶ If needed, connect headphones or speakers to the headphones symbol.



#### **DANGER**

##### **Hearing damage from loud volume setting**

Loud volume setting can damage hearing.

- ▶ Do not set volume of headphones too loud.
-

## 5.2 Installing the control unit

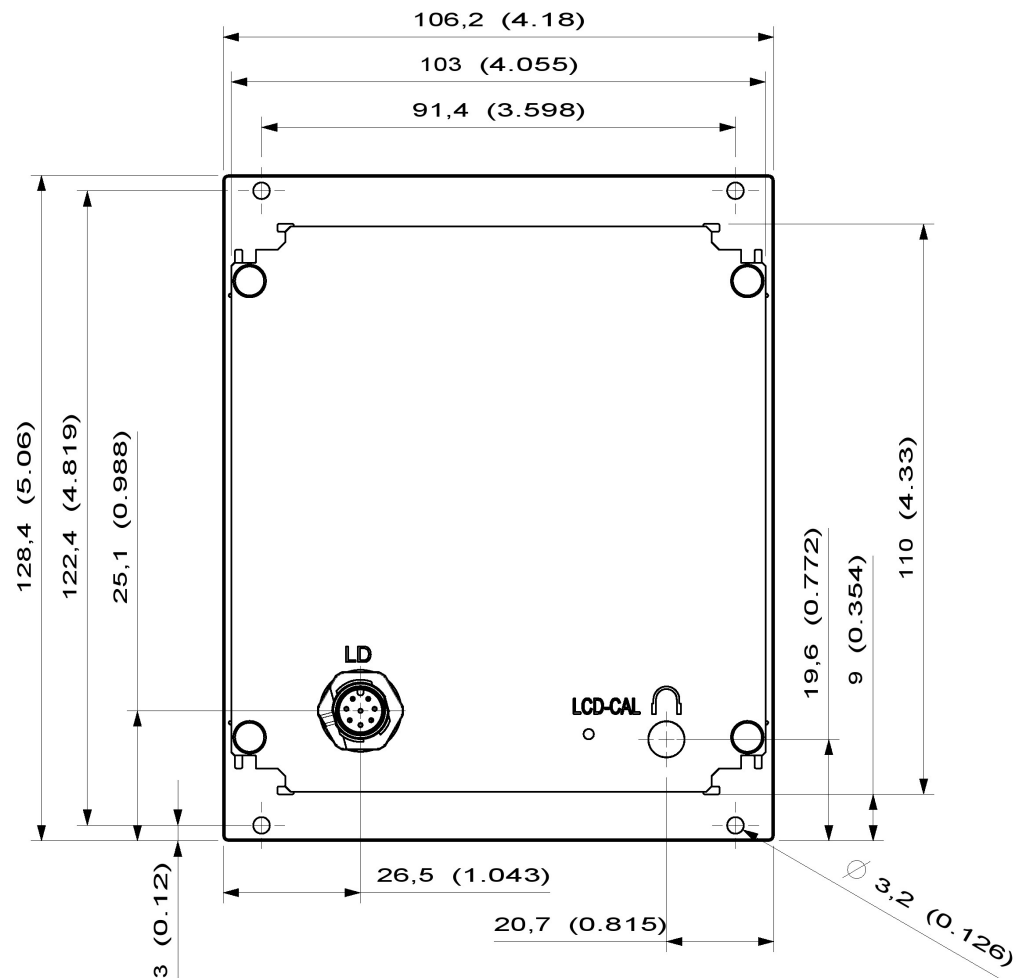


Fig. 3: Dimensions of the control unit in mm (inches in brackets)

- Recess for the control unit integrated in the test system.
- ▶ Push the control unit into the recess and screw it tight.
- ▶ Pull protection film from touch screen.

# 6 Operation CU1000

## NOTICE

**Damage to touch screen from incorrect operation.**

The touch screen can be damaged with a hard or pointed item.

- ▶ Operate touch screen with fingers only.

## 6.1 Touchscreen elements

### 6.1.1 Measurement display elements

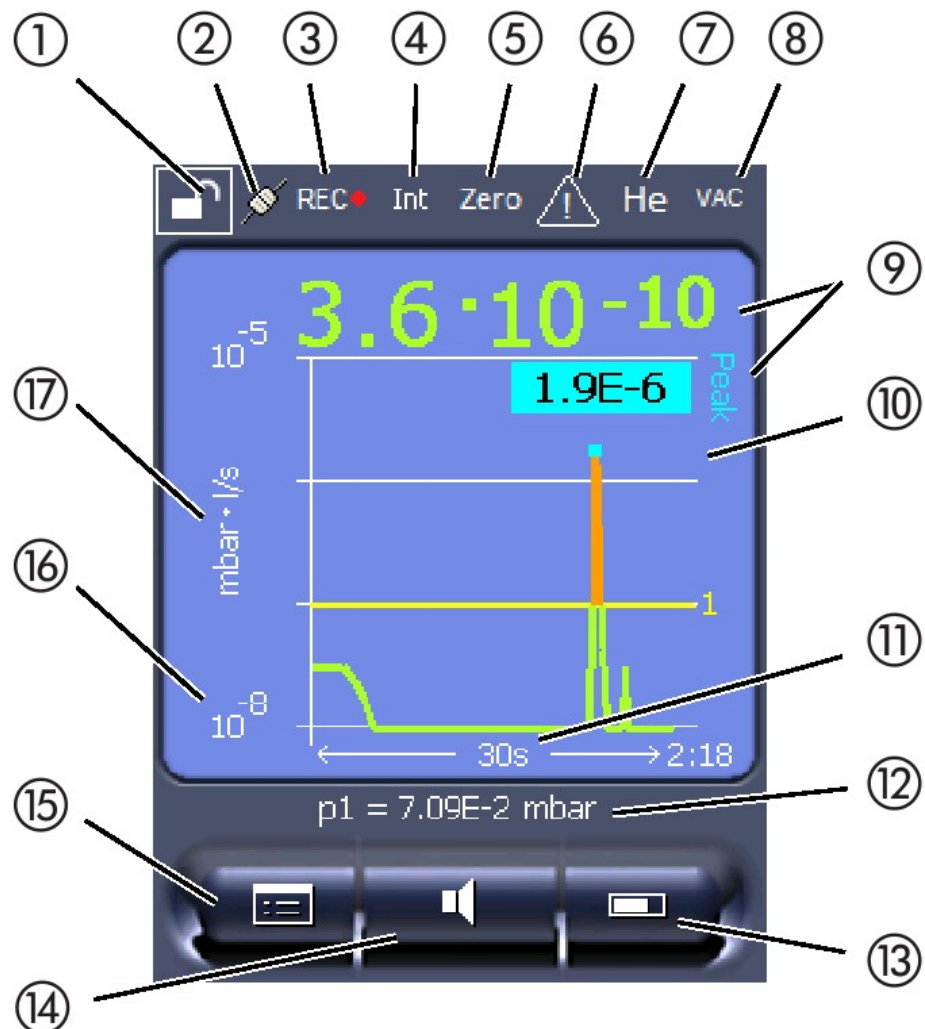


Fig. 4: Measurement display

1	Keyboard lock	10	Graphic representation of the leak rate and the peak hold function
2	Communication status	11	Time axis
3	Data recording	12	Backing pressure
4	Operator	13	Button "Favorite 2"
5	ZERO	14	Button "Favorite 1"
6	Message	15	Menu
7	Tracer gas	16	Value axis
8	Operating mode	17	Value axis
9	Leak rate with peak hold function		

### 1 - Keyboard lock

The control unit is locked or unlocked by pressing and holding the icon for the keyboard lock.

### 2 - Icon for the communication status

- Icon connected: The device communicates with the mass spectrometer module.
- Icon disconnected: The device does not communicate with the mass spectrometer module.

Establish communication:

- 1 Reset control unit.
- 2 Checking the status of the mass spectrometer module.
- 3 Check cable connection.

### 3 - Icon for the data recording

The measurement is recorded.

### 4 - Ser

The registered operator is shown abbreviated.

Display	Meaning
Ope	Operator
Sup	Supervisor
Int	Integrator
Ser	Service

For more information, see Chapter 6.2.2., Page 20.

## 5 - ZERO

Background suppression is active.

## 6 - Caution icon

Active warnings are stored in the unit.

The active warnings can be displayed via the menu "Info > History > Warnings".

## 7 - Tracer gas

Set tracer gas and tracer gas concentration percentage.

Display	Meaning
He	Helium ( $^4\text{He}$ )
H2	Hydrogen
M3	E.g. H-D, $^3\text{He}$ or $\text{H}_3$

## 8 - Operation mode

Configured operation mode

Display	Operating mode
VA	Vacuum
SNIF	Sniff
LOW FLOW	XL sniffer adapter in LOW FLOW
HIGH FLOW	XL sniffer adapter in HIGH FLOW
Standby	XL sniffer adapter in HIGH FLOW on standby

## 9 - Leak rate

Current measurement for the leak rate.

## 10 - Graph

Graphic display of the leak rate  $Q(t)$ .

## 11 - Leak rate

Time axis of the leak rate  $Q(t)$ .

## 12 - Primary vacuum pressure (not with operating mode XL Sniffer Adapter)

Backing pressure  $p_1$ .

### 13 - Button "Favorite 2"

You can assign preferred parameters to this button (see Page 19 ). In Fig. 4 the button "Favorite 2" is assigned the function "Start/Stop" for example.

### 14 - Button "Favorite 1"

You can assign preferred parameters to this button (see Page 19 ). In Fig. 4 the button "Favorite 1" is assigned the function "ZERO" for example.

### 15 - Icon for the menu

All functions and parameters of the control unit can be accessed using the "Menu" key .

A full display of the menu of the menu is included as a file on the USB stick supplied with the LDS3000.

### 16 - Value axis

Value axis of the leak rate  $Q(t)$ .

### 17 - Device of measurement

Device of measurement of the value axis.

## 6.2 Settings and functions

Settings and functions of the control unit are explained in the following. You will find the settings and functions of the mass spectrometer module LDS3000 you can set using the control unit in the operating instructions of the mass spectrometer module.

### 6.2.1 Touch screen settings

The touch screen grays out the parameters if

- the user is not authorized to modify the values,
- the older version of the software run by mass spectrometer module LDS3000 does not support this parameter.

#### Scaling of the $Q(t)$ axis

Linear or logarithmic	
Lin.	
Log.	
Control unit	Display > $Q(t)$ axis > Linear or logarithmic

	Number of decades with logarithmic view	
	1	
	2	
	3	
	4	
	Control unit ü	Display > Q(t) axis > Decades
	Auto scale	
	Off	
	On	
	Control unit	Display > Q(t) axis > Auto scale
<b>Scaling of the time axis</b>	Scaling of the time axis	
	15 s	240 s
	30 s	480 s
	60 s	960 s
	120 s	
	Control unit	Display > Time axis > Time axis scale
<b>Display units</b>	Device of pressure	
	Mbar	Atm
	Pa	Torr
	Control unit	Display > Units (display) > Pressure unit
<b>Measured value display</b>	Type of graphic display	
	Diagram	
	Bar graph	
	Control unit	Display > Measurement view > Measurement view mode
	Numeric representation of the measurements	
	Off	
	On	
	Control unit	Display > Measurement view > Show value

<b>Display brightness</b>	Display brightness	
	20 - 100%	
	Control unit	Display > Brightness > Display brightness
<b>Trigger display on the touch screen</b>	Selection of the trigger (leak rate threshold) displayed on the touch screen.	
	1	
	2	
	3	
	4	
Control unit	Settings > Trigger > Trigger sel.	
<b>Assigning favorite buttons</b>	The favorite buttons offer direct access to individual functions. They can be assigned with access control "Supervisor" or higher by the user.	
	Favorite 1: Middle button (see Fig. 4, Page 15).	
	Favorite 2: Right button	
	Favorite 3: Button on the bottom right of the main menu.	
	CAL	Volume
	ZERO	- - - (= without function)
	Measurement view	Check CAL
	Start/Stop	Flow switching
	View settings	
	Control unit	Settings > Favorites > Favorite 1 (2, 3)
<b>Display of messages on the touch screen</b>	Warnings and error messages can be displayed on the touch screen.	
	Off	
	On	
	Control unit	Settings > Set up > Control unit > Messages > Show warnings



<b>Show calibration note</b>	Suppress or allow the calibration note with the following content:	
	<ul style="list-style-type: none"> <li>• Leak rate of the applied calibration leak</li> <li>• No calibration should take place during the first 20 mins</li> </ul>	
	OFF (suppressed)	
	ON (allowed)	
Control unit	Settings > Set up > Control unit > Messages > Show calibration notes	

<b>Show calibration request</b>	The calibration request can be allowed or suppressed.	
	OFF (suppressed)	
	ON (allowed)	
	Control unit	Settings > Set up > Control unit > Messages > Show calibration request

<b>Setting the audio alarm</b>	Warnings and error messages can be displayed on the touch screen.	
	Off	
	On	
	Control unit	Settings > Set up > Control unit > Messages > Show warnings

Volume of the headphones or active speaker	
--- No sound	
Proportional: The frequency of the audible signal is proportional to the bar graph display or diagram height. The frequency range is 300 Hz to 3300 Hz.	
Setpoint: The pitch is proportional to the leak rate. The signal sounds if the leak rate exceeds the selected trigger value.	
Pinpoint: The sound of the acoustic signal changes its frequency within a specific range of leak rates. Range: A decade below the selected trigger threshold up to one decade above. The sound keeps at a constant low and a constant high frequency below and above this range, respectively.	
Trigger: If the selected trigger threshold is exceeded, a two-pitch signal sounds.	
Control unit	Settings > Set up > Control unit > Audio > Audio alarm mode

**Behavior with warnings or error messages:** If the touch screen shows a warning or an error, then a two-pitch signal sounds simultaneously.

**Automatic switch off of the touch screen**

The touch screen can be switched off automatically after a specific time without any operation to save energy.	
30 s	10 min
1 min	30 min
2 min	1 h ∞ (=never)
5 min	
Control unit	
Settings > Set up > Control unit > Energy > Display off after	

## 6.2.2 Operator types and authorizations

There are four different operator types that are distinguished by different authorizations. The integrator is registered ex works.

Additional operators can be registered. The following table shows options for individual operator types to register new operator types.

### Operator registration

Viewer	Operator	Supervisor	Integrator
-	Operator	Supervisor	Integrator
	Viewer	Operator	Supervisor
		Viewer	Operator
			Viewer

For the types "Integrator", "Supervisor" and "Operator", a four-digit PIN must be assigned during registration (0000 ... 9999). "0000" is assigned to all operators ex works.

If an operator keeps the pin "0000", this operator will always be registered is during the start up of the system (without PIN query).

A key-operated switch can be used in addition to a PIN if an I/O module is connected. The key-operated switch is connected to the I/O module via three digital inputs (see operating instructions of the LDS3000).

The following table shows the authorizations of individual operator types.

Function	Viewer	Operator	Supervisor	Integrator
Changing parameters	-	x	x	x
Changing the display of error information	-	x	x	x
Calling up factory settings	-	-	-	x
Entering maintenance history	-	-	-	x

The menu "Service" is accessible only to INFICON service staff.

### Load parameters

The saved/backed-up parameters of control unit CU1000 and of the mass spectrometer module can be loaded from a USB flash drive.

Menu	Function > Data > Parameters > Load
------	-------------------------------------

### Save parameters

The parameters of control unit CU1000 and of the mass spectrometer module can be saved to a USB flash drive.

Menu	Function > Data > Parameters > Save
------	-------------------------------------

### Display error information

The type of error information can be set differently for each operator type. The Integrator always receives the complete information. Number: Message text: Short description info: Expanded message information

- Only numbers
- Number and text
- Number, text and info

Menu	Function > Data > Parameter > Error info Viewer (Operator, Supervisor)
------	--

### Parameter list display and change

Parameters can be displayed as an alphabetical list with names and current value s. Each list entry is a button which, when pressed, will open the parameter's set-up dialog box.

Menu	List > Parameters list <b>or</b> : Functions > Data > Parameters > List
------	--

### Display list of parameter change authorizations

Parameters can be displayed as an alphabetical list with names and current change authorizations. Each list entry is a button which, when pressed, will change access control. Changes are possible in accordance with the hierarchy of the operator.

Menu	Functions > Data > Parameters > Parameter Access
------	--

## 6.2.2.1 Logging out the operator

The operator activates access level "Viewer" to log out. "Access Ctrl > Viewer"

## 6.2.3 Functions

### 6.2.3.1 Resetting the settings

#### Mass spectrometer module

The settings of the mass spectrometer module can be reset to factory settings.

Menu	Functions > Data > Parameters > Reset > MSB settings
------	--

<b>Access controls</b>	The authorization for changing parameters can be reset to factory setting.	
	Menu	Functions > Data > Parameters > Reset > Param. access control
<b>Control unit</b>	The control unit settings can be reset to factory settings.	
	Menu	Functions > Data > Parameters > Reset > Control unit settings

### 6.2.3.2 Recording data

The data is saved as a TXT file. Each TXT file contains the following information:

- Date created
- Software version
- Serial number
- Start time
- Time stamp (measurement indicates offset in seconds in relation to start time)
- File name
- Time stamp (offset in seconds in relation to start time)
- Leak rate (expressed in selected unit)
- Pressure p1 (expressed in selected unit)
- Device status

<b>Switching on/off</b>	Switching data recording on/off	
	<ul style="list-style-type: none"> <li>• Off</li> <li>• On</li> </ul>	
	Menu	Functions > Data > Recorder > Settings > Data recording
<b>Record interval</b>	Time interval between data recordings	
	<ul style="list-style-type: none"> <li>• 100 ms, 200 ms, 500 ms, 1 s, 2 s, 5 s</li> </ul>	
	Menu	Functions > Data > Recorder > Settings > Record interval
<b>Memory location</b>	The data stored in the control unit can be saved to a USB flash drive. The memory in the control unit is limited to the recording of a 24-hour measurement.	
	<ul style="list-style-type: none"> <li>• USB stick</li> <li>• Control unit</li> </ul>	
	Menu	Functions > Data > Recorder > Settings > Storage location

<b>Copy data</b>	The data stored in the control unit can be saved to a USB stick. The memory in the control unit is limited to the recording of a 24-hour measurement.	
	<ul style="list-style-type: none"> <li>• USB stick</li> <li>• Control unit</li> </ul>	
	Menu	Functions > Data > Recorder > Settings > Storage location
<b>Deleting data</b>	The data stored in the control unit can be saved to a USB flash drive. The memory in the control unit is limited to the recording of a 24-hour measurement.	
	<ul style="list-style-type: none"> <li>• USB stick</li> <li>• Control unit</li> </ul>	
	Menu	Functions > Data > Recorder > Settings > Storage location

### 6.2.3.3 Calling up information

Different information and states of the system can be called up with the info menu.

<b>Measurement</b>	<ul style="list-style-type: none"> <li>• Preamplifier</li> <li>• Environment</li> <li>• TMP</li> </ul>
<b>Temperature</b>	<ul style="list-style-type: none"> <li>• Electronic</li> <li>• TMP</li> </ul>
<b>Energy and operating hours</b>	<ul style="list-style-type: none"> <li>• Energy values: Information on consumption values</li> <li>• Operation hours: Display for operating hours</li> <li>• Supply voltages: Information on internal supply voltages</li> <li>• Power supply: Information on the supply voltages of the components</li> </ul>
<b>History</b>	<ul style="list-style-type: none"> <li>• Error, error history / warning history</li> <li>• Calibration, calibration history</li> <li>• TMP error, TMP history</li> <li>• Warnings, active warnings</li> <li>• Maintenance, maintenance history</li> </ul>
<b>Control unit</b>	<ul style="list-style-type: none"> <li>• Version control unit: Information on the software version</li> <li>• Memory: Information on available memory</li> <li>• Settings: Control unit settings.</li> <li>• Serial port wired: Information on the communication connection</li> <li>• Data exchange: Information on the data exchange between mass spectrometer module and the control unit</li> </ul>

**Mass spectrometer module**

- MSB (1): Information on the software version
- MSB (2): Information on operating parameters
- TMP controller (1): Information on the turbo molecular pump
- TMP controller (2): Information on the turbo molecular pump, continued
- Ion source: Information on the ion source used
- Preamplifier: Information on the preamplifier
- Preamplifier test: Information on the preamplifier test.

**Interfaces**

- I/O module (1): Information on the software version, inputs and outputs
- I/O module (2): Visualized information to the digital inputs

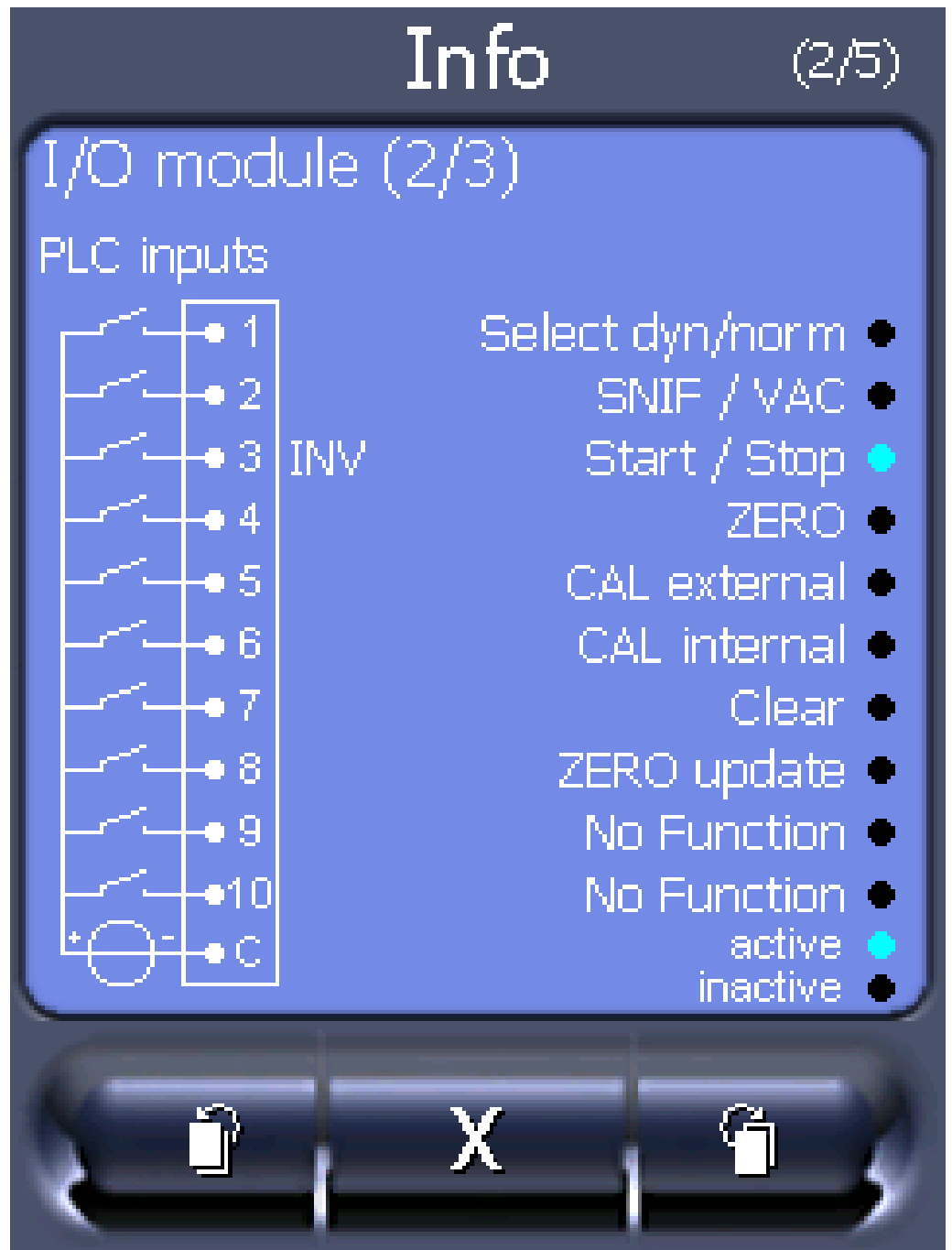


Fig. 5: I/O module (2): Visualized information to the digital inputs

1	Input signal condition	2	Configured function (INV = Function is inverted)
3	Status of the function (active or inactive)		

- I/O module (3): Visualized information to the digital outputs

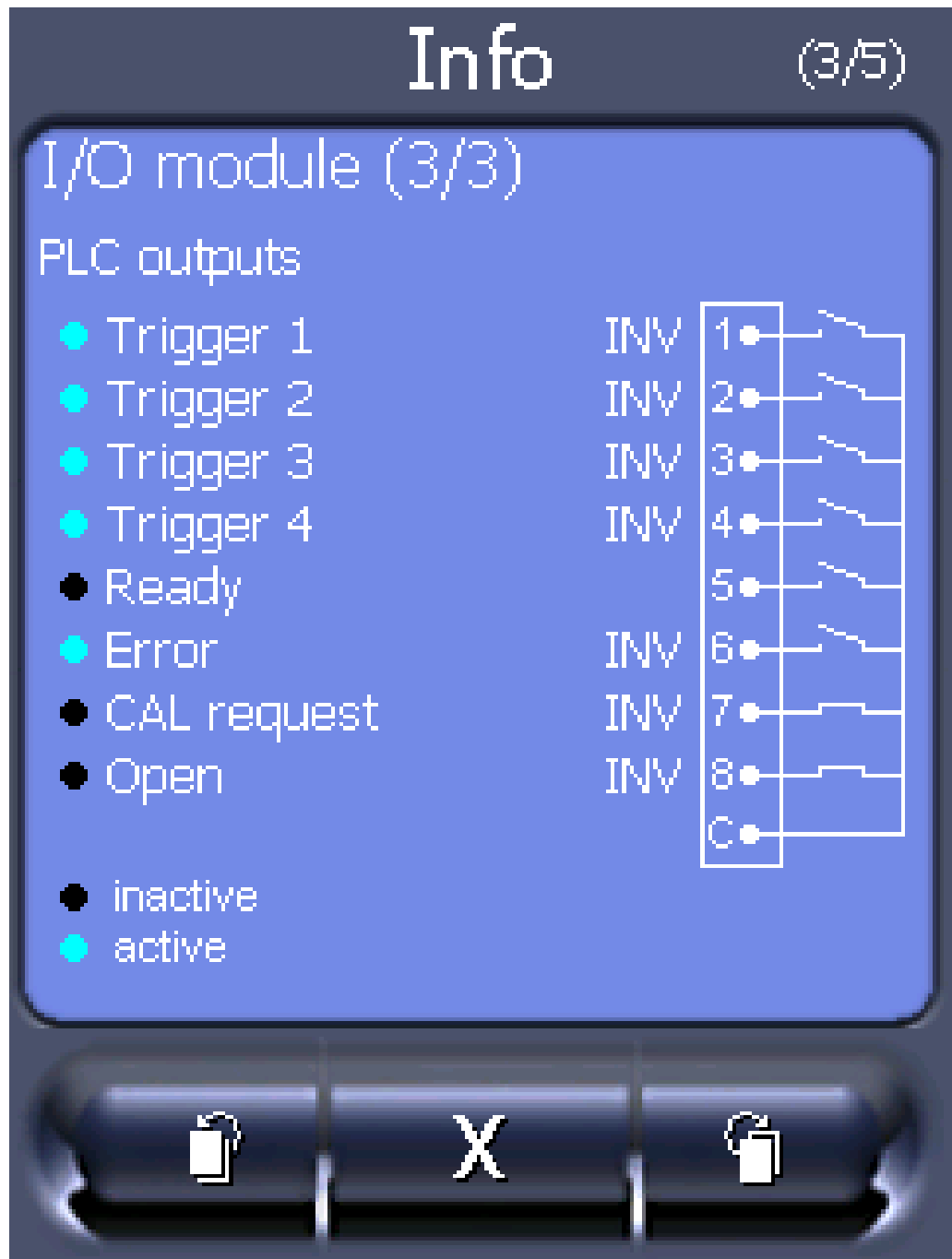


Fig. 6: Visualized information to the digital outputs

1	Configured function (INV = Function is inverted)	2	Output signal condition
3	Status of the function (active or inactive)		

- Bus module (1): Information on the bus module
- Bus module (2): Information on the bus module, continued



## 6.2.4 Updating the software

Software updates from INFICON are installed with the aid of a USB stick. The update function of the device can be found under "Functions > Data > Update".

An update is possible,

- if one or several updates are available on the USB stick, but only one update per type at most (control unit, MSB box, I/O module),
- if these parts are also connected free of disturbances and have an update function.

The corresponding buttons in the update menu such as "Control Unit", "MSB Box", and "I/O Module" are active and can be activated individually.

### NOTICE

#### Aborted connection

Data loss due to an aborted connection

- ▶ Do not switch off the device and do not remove the USB stick while the software is being updated.

- ▶ Switch the device off and back on after a software update has taken place.

### 6.2.4.1 Updating the software of the control unit

The software is included in two files named Handset\_IFC\_Vx.xx.xx.exe and Handset\_IFC\_Vx.xx.xx.key.

- 1 Copy the file into the main directory of a USB stick.
- 2 Connect the USB flash drive to the USB port on the device.
- 3 Select: "Functions > Data > Update > Control unit".
  - ⇒ Do not switch off the device and do not remove the USB stick while the software is being updated.
- 4 Check the version information.
- 5 Select the "Start" button to start the update. Do not switch off the device and do not remove the USB stick while the software is being updated.
- 6 Follow the instructions on the touchscreen and wait until the update is complete.

### 6.2.4.2 Checking and updating the software version of the MSB box

The current software is available from the Inficon support.

The functions of the XL Sniffer adapter set are taken into consideration in system software version 2.11 or higher.

- 1** Copy the file Flash\_LDS3000\_MSB\_Vxx.xx.xxx.bin into the main directory of a USB stick.
- 2** Connect the USB flash drive to the USB port on the device.
- 3** Select: "Functions > Data > Update > MSB".
  - ⇒ The display shows information on the current and the new software version as well as on the boot loader.
- 4** Check the version information.
  - ⇒ Select the "Start" button to start the update.
  - ⇒ Do not switch off the device and do not remove the USB stick whilst the software is being updated! Do not switch off the device and do not remove the USB stick while the software is being updated.
- 5** Follow the instructions on the touchscreen and wait until the update is complete.
- 6** If the system displays warning 104 or 106, confirm with "C".

### 6.2.4.3 Updating the software of the I/O module

The software of the I/O module can be updated from the control unit if the mass spectrometer module has the software version "MS module 1.02" or higher.

- 1** Copy the file Flash\_LDS3000\_IO\_Vxx.xx.xxx.bin into the main directory of a USB stick.
- 2** Connect the USB flash drive to the USB port on the device.
- 3** Select: "Functions > Data > Update > I/O module"
  - ⇒ The display shows information on the current and the new software as well as on the current boot loader.
- 4** Check the version information.
- 5** Select the "Start" button to start the update.
  - ⇒ Do not switch off the device and do not remove the USB stick while the software is being updated.
- 6** Follow the instructions on the touchscreen and wait until the update is complete.
  - ⇒ The following tips are shown after selecting the "Start" button on the touchscreen:
    - Connect and switch on the IO1000.
    - Activate boot mode (switch DIP S2.3 on and off once).
    - When the STATUS LED flashes green, press OK.

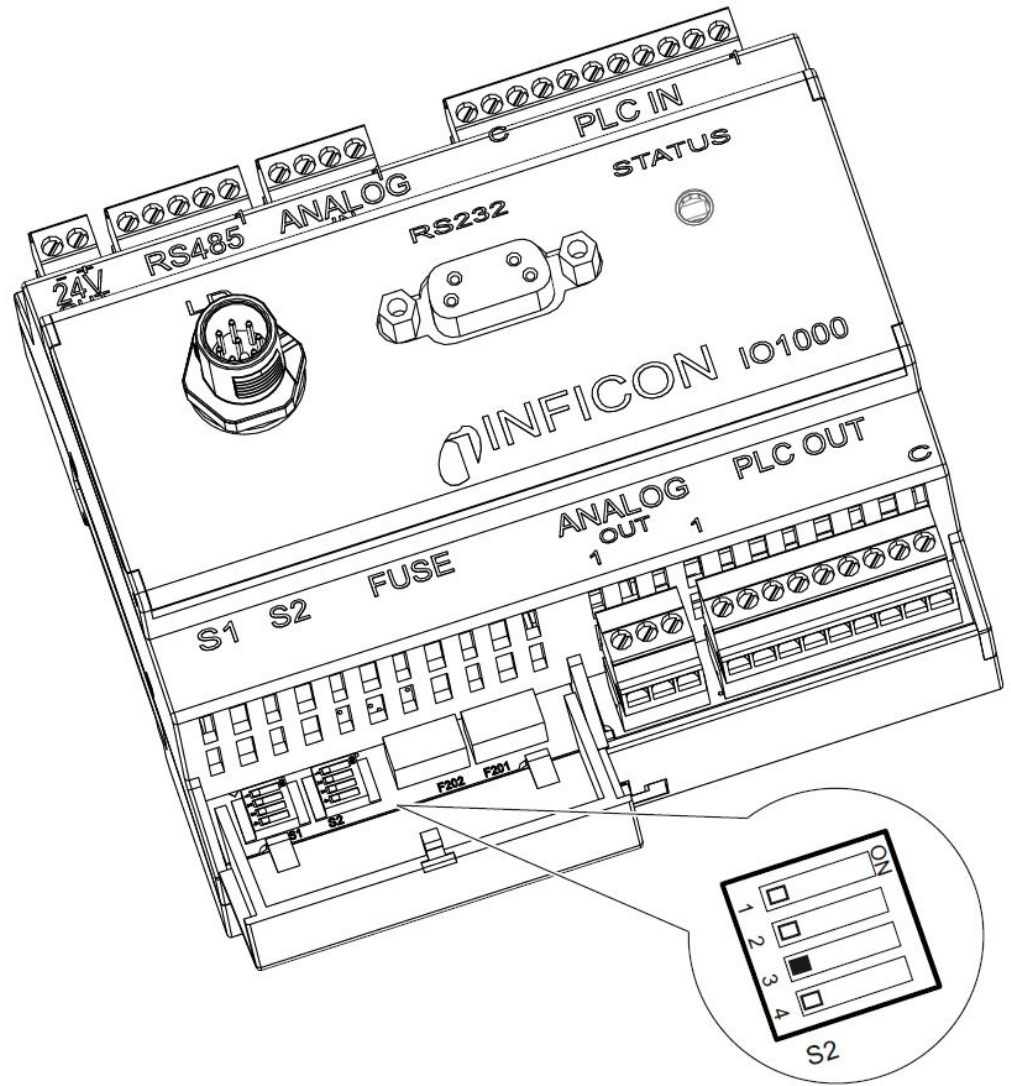


Fig. 7: DIP switch on the I/O module

## 7 Decommissioning the device

### 7.1 Disposing of the device

The device can either be disposed of by the operator or be sent to the manufacturer. The device consists of materials that can be recycled. This option should be exercised to prevent waste and also to protect the environment.

During disposal, observe the environmental and safety regulations of your country.

### 7.2 Sending in the device



#### **WARNING**

##### **Danger due to harmful substances**

Contaminated equipment endanger those who come into contact with .

- ▶ Fill in the declaration of contamination completely.
- ▶ Attach the declaration of contamination on the outside of the packaging.

The declaration of contamination is a legal requirement and serves to protect our employees. We send devices, which are sent without a completed declaration of contamination back to the sender.



