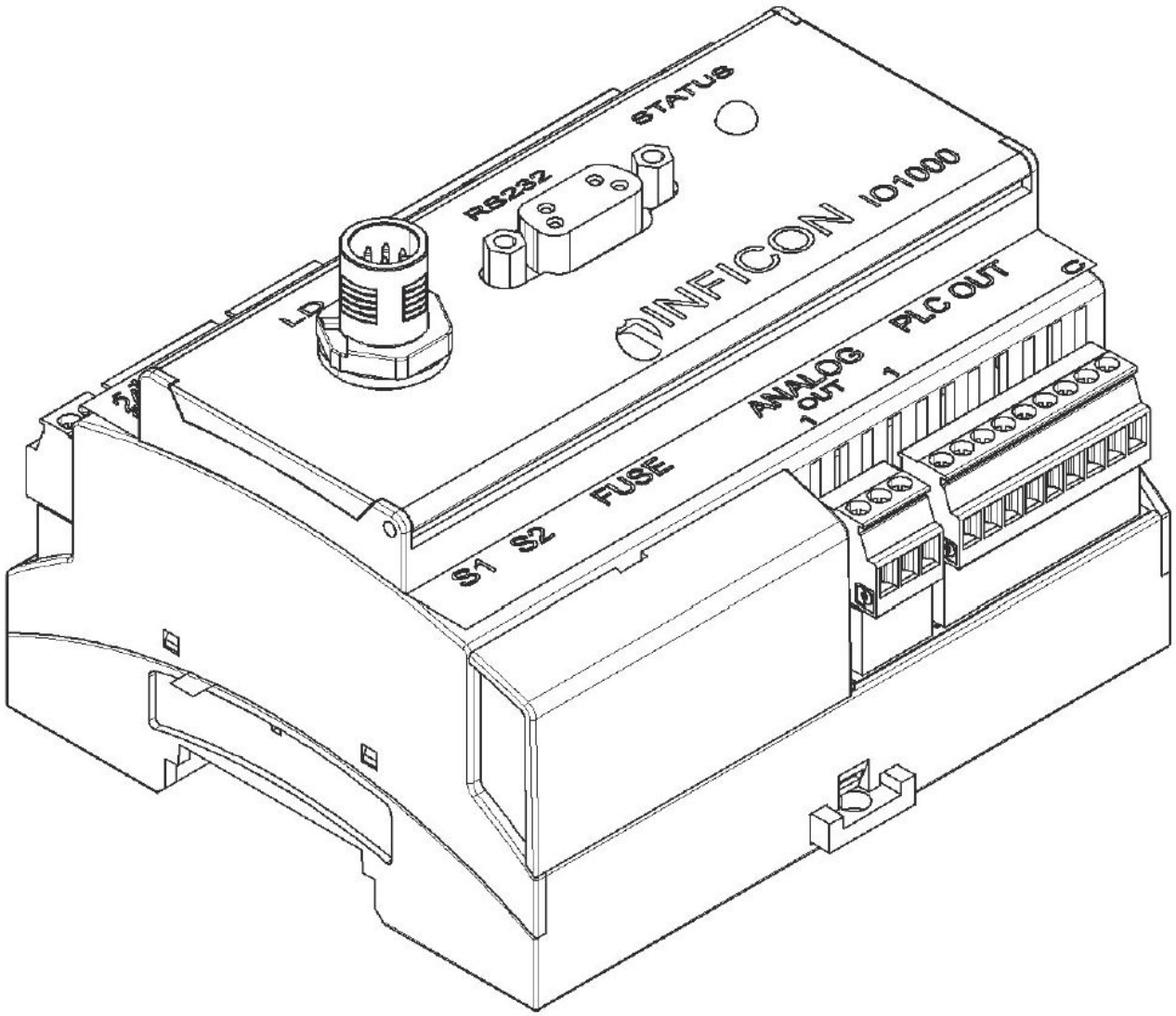

Translation of the operating instructions

IO1000

I/O-Modul

Catalog No.:
560-310

from software version:
I/O-Modul 1.11

jiqc10en1-04 (1604)

INFICON GmbH
Bonner Strasse 498
50968 Cologne, Germany

Table of Contents

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

Operating instructions of the connected leak detector	
LDS3000 Interface Protocols	jira54
HLD6000 Interface Protocols	kirb43

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 I/O module is a device interface between a leak detector and an external controller.

► Install, operate and service the device only in compliance with these instructions.

2.2 Owner requirements

Safety conscious operation

► Operate and install the device only if it is in perfect working order and as intended, in a safety-conscious manner and fully aware of dangers, in compliance with these instructions.

► Fulfill and ensure compliance with the following regulations:

– Intended use

– Generally applicable 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 technical specialists who have been trained on the device.

► Allow personnel in training to work with the device only under the supervision of technical specialists.

► Make sure that the authorized personnel have read and understood these instructions and all other applicable documents (refer to "Other associated documents [▶ 4]"), 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.

► Perform all work based on the complete instructions.

3 Shipment

Shipment

Item	Quantity
I/O module	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 material.

► Keep original packaging material.

4 Description

4.1 Construction of the I/O module

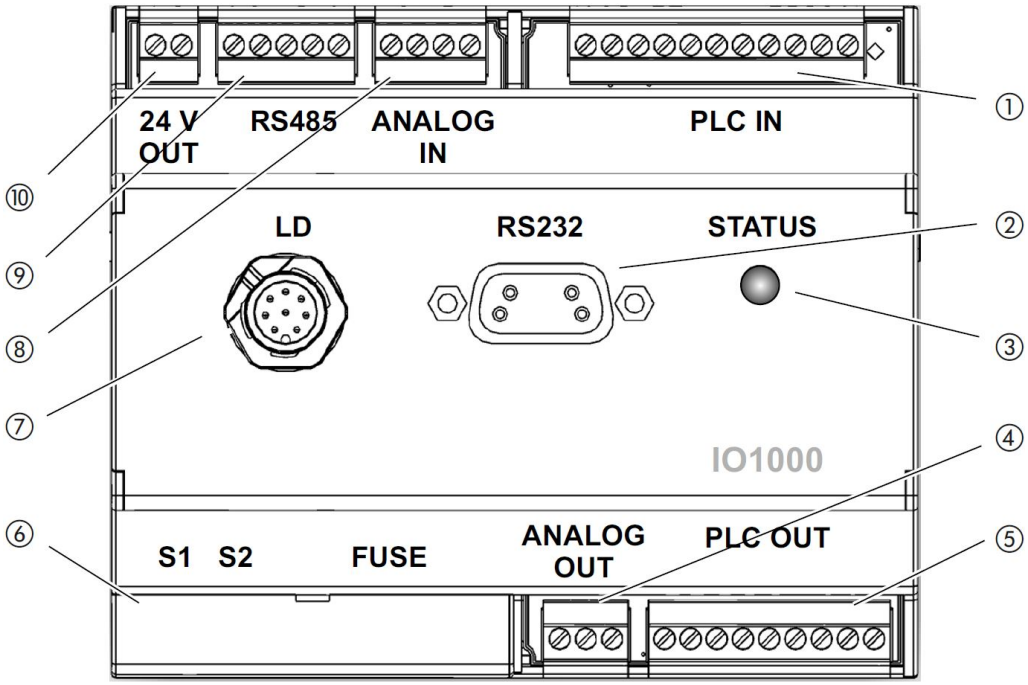

Fig. 1: Front view

1	PLC IN, digital inputs	6	DIP switch cover and fuse
2	RS232	7	LD, connection of leak detector
3	Status LED	8	ANALOG IN, analog inputs
4	ANALOG OUT, analog outputs	9	RS485
5	PLC OUT, digital outputs	10	24 V OUT, 24 volt output

PLC IN, Fig. 1 (1)

Digital inputs

Galvanic isolation (max. 60 V DC, 25 V AC against GND)
maximum permissible input voltage: U = 35 V

Active signal: V = 13 ... 35 V (typical 24 V), I = approx. 7 mA
Inactive signal: U < 7 V (typical 0 V), I = 0 mA

Pin assignment: The input pins PLC-IN 1 to PLC-IN 10 can be configured freely, see the following example:

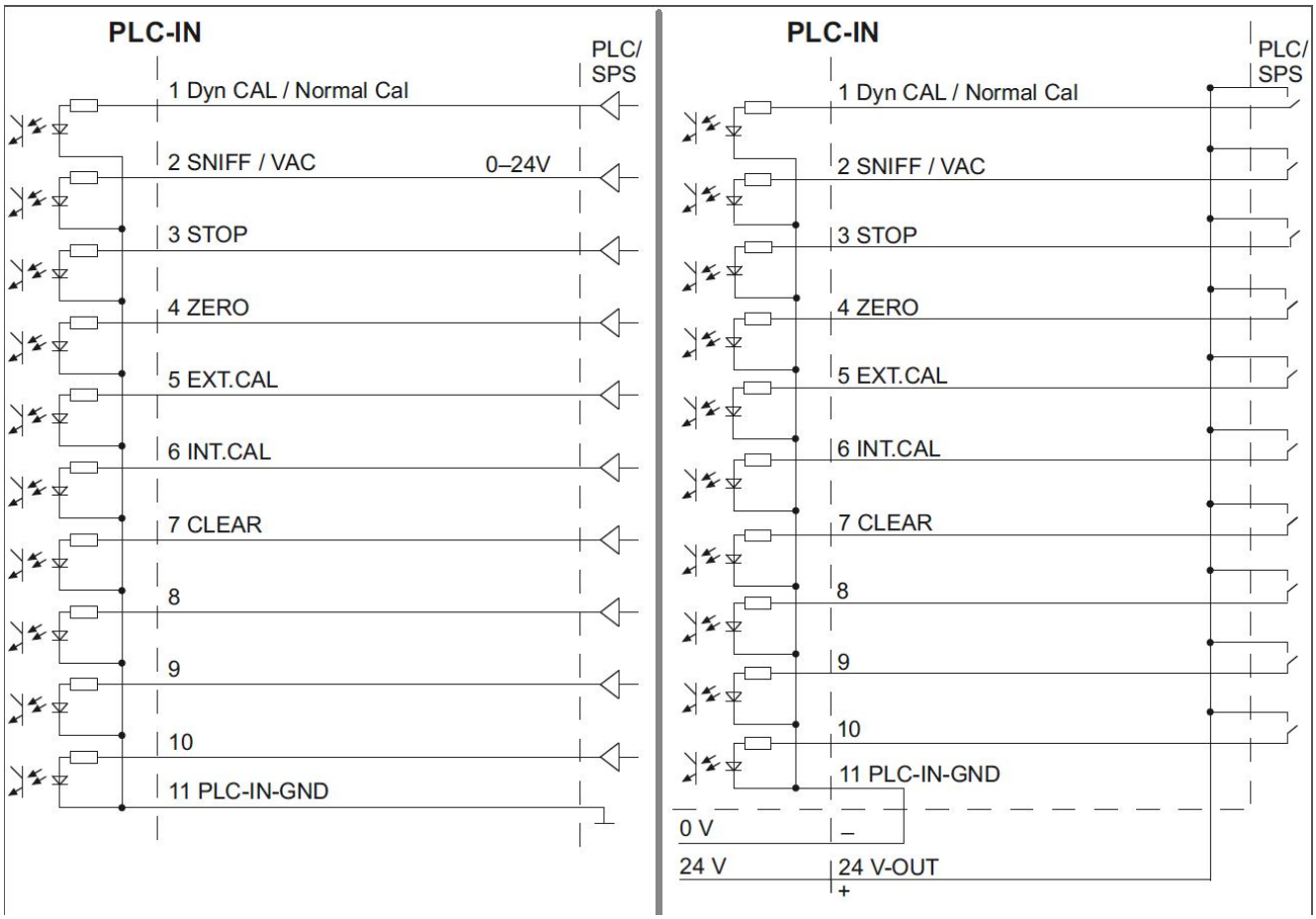

Fig. 2: Sample wiring, digital inputs with PLC. Left: Driver outputs, right: Potential-free contacts

PLC OUT, Fig. 1 (5)

Digital outputs

Galvanic isolation (max. 60 V DC, 25 V AC against GND)
maximum permissible load each output: U = 30 V, I = 0.75 A

Fuses for digital outputs 1 ... 4 and 5 ... 8: 2 x 0.75 A

Pin assignment: The output pins PLC_OUT_1 to PLC_OUT_8 can be configured freely, see the following example:

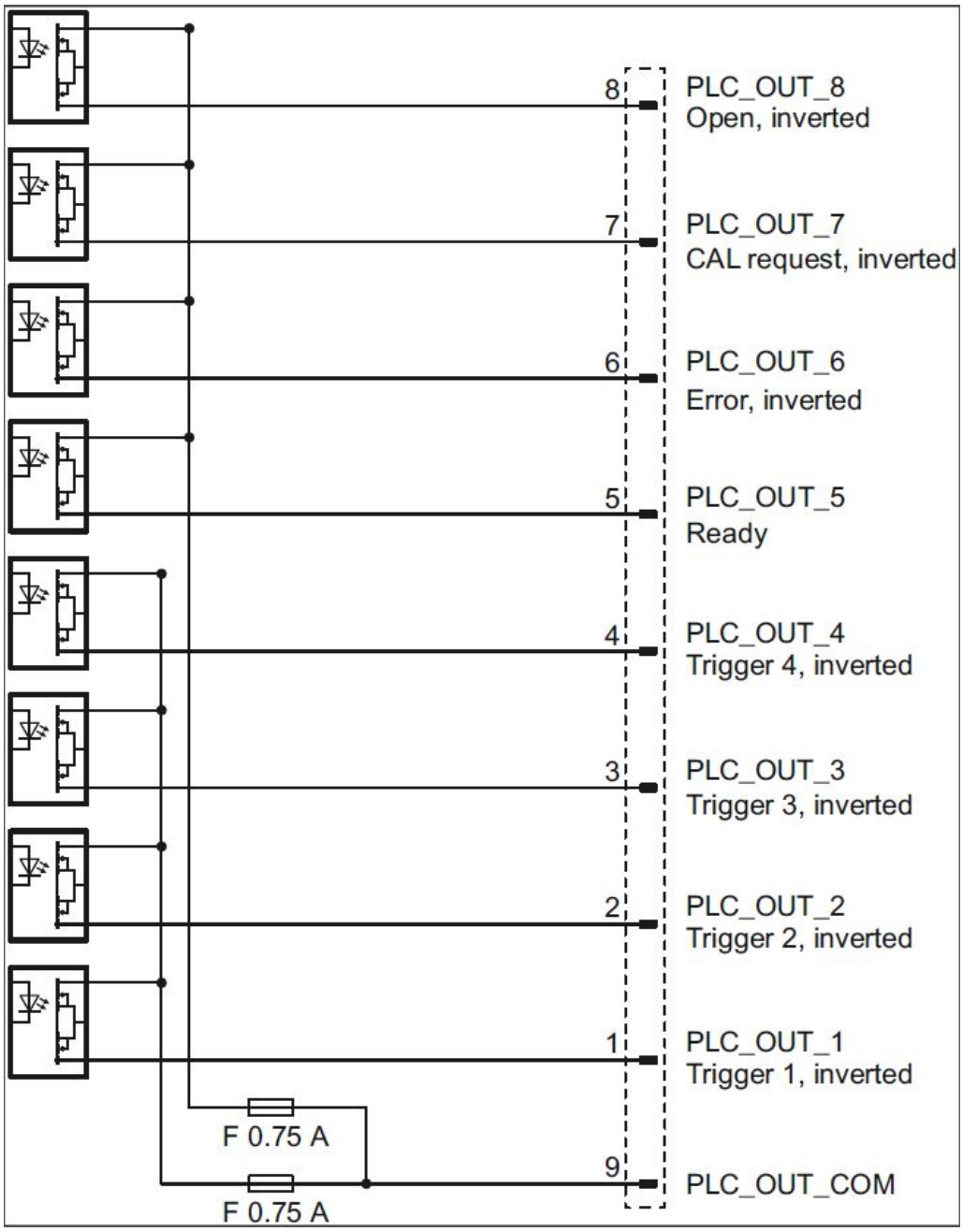

Fig. 3: Sample wiring, digital outputs

ANALOG IN, Fig. 1 (8)

Analog input (input voltage range 0 V to 10.8 V)

Pin assignment:

1	24V supply (output)
2	GND to 24V supply
3	Analog input (0 V to 10.8 V)
4	GND to analog input

ANALOG OUT, Fig. 1 (4)

Analog outputs (for example for logging leak rate and backing pressure)

Galvanic isolation (max. 60 V DC, 25 V AC against GND)

Voltage range	0 - 10 V
Precision	±15 mV offset, additional ±1% from measurement (current output voltage) as linearity error (at 25 °C)
Resolution	typ. 2.5 mV
Load	> 10 kΩ

Pin assignment:

1	Analog output 1: ANALOG-OUT 1
2	Analog output 2: ANALOG-OUT 2
3	GND to analog output

The output pins can be freely configured.

RS232, Fig. 1 (2)

Connection for RS-232

Galvanic isolation (max. 60 V DC, 25 V AC against GND)

Pin assignment:

Pin	Name
2	TxD
3	RxD
5	GND

A normal RS-232 cable must be used for the connection (1:1 connection, RxD and TxD not crossed, no zero-modem cable).

► Deactivate RS-232 hardware handshake in RS-232 control program.

If the hardware handshake cannot be deactivated, the RS-232 can be used as follows:

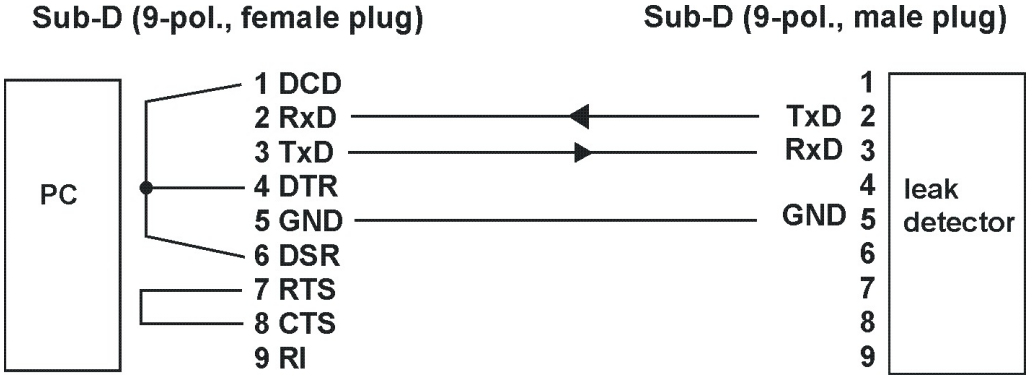

Fig. 4: Connection with RS-232 cable (in case hardware handshake cannot be deactivated)

RS485, Fig. 1 (9)

Connection for RS-485

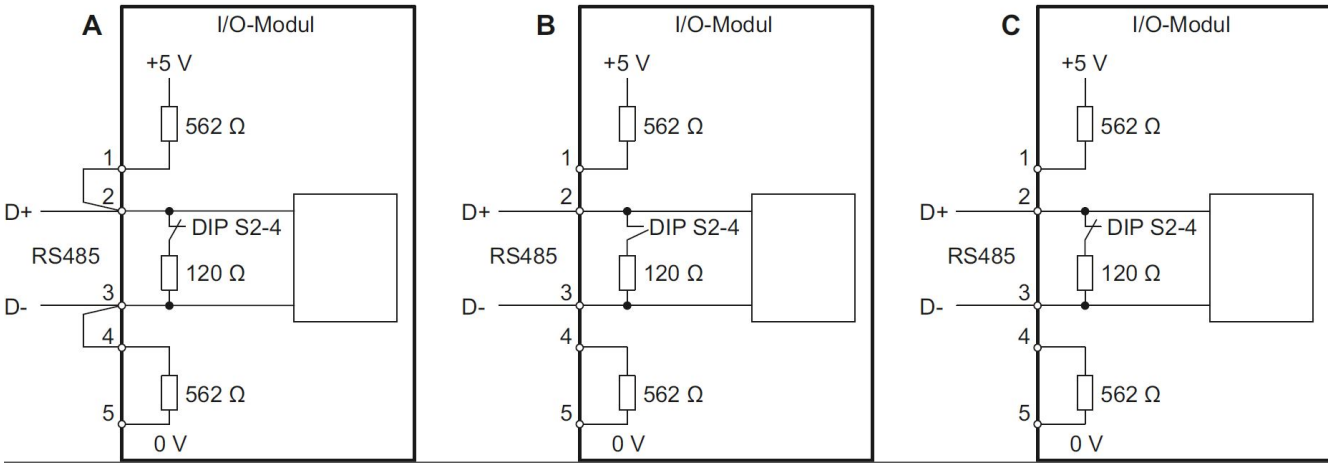

Fig. 5: RS-485 bus terminator

A	Active bus terminator	C	Passive bus terminator
B	Without bus terminator		

Galvanic isolation (max. 60 V DC, 25 V AC against GND)

Pin assignment:

Pin	Name
1	Connect pull-up resistor (562 Ω against +5 V) with D+ if necessary
2	D+
3	D-
4	Connect pull-down resistor (562 Ω against GND) with D- if necessary
5	COM

The bus terminator integrated in the I/O module (120 Ω) between D+ and D can be disabled via DIP switches S2-4. The BUS address is 1. BUS operation with more than two subscribers is not possible.

STATUS LED, Fig. 1 (3)

Color	Status	Meaning
Red	illuminates	Device not functional or defective
Red	flashes	Not ready for operation, communication to leak detector is not available
Cyan	illuminates	Ready for operation; communication to leak detector available
Green	Flashes quickly	Boot loader active, ready for software update
Green	Flashes slowly	Data reception on RS232
Yellow	Flashes slowly	Data reception on RS485
–	off	No operating voltage

FUSE and DIP switch S1, S2,Fig. 1 (6)

Fuses for digital outputs and DIP switches (under the cover)

Fuses for digital outputs 1 ... 4 and 5 ... 8:
2 x 0.75 A (Schurter: 7010.9800.xx)

DIP switch S1	LDS3000	HLD6000	Contact			
			4	3	2	1
Factory setting (default value of the interface protocol by the leak detector or control unit)	•	•	0	0	0	0
ASCII protocol	•	•	0	0	1	0
LD protocol	•	•	0	0	1	1
Binary protocol	•		0	1	0	1
LDS1000 protocol	•		0	1	1	0
Normal protocol		•	0	0	0	1
Simple protocol		•	0	1	0	0

1 = ON, 0 = OFF

DIP switch S2	Contact			
	4	3	2	1
Activate boot mode for software update	X	+	0	0
Disable bus terminator 120 Ω for RS-485	1	X	0	0

1 = ON, 0 = OFF, + = switching from OFF to ON during operation, X = random

Connection LD, Fig. 1 (7)

Connection for data cable to the leak detector

24V OUT, Fig. 1 (10)

24-V-output

Pin assignment:

Pin	Name
+	+ 24 V
-	GND

The I/O module is supplied with voltage by the leak detector and requires no separate power supply. The 24V output is not used for voltage supply to the I/O module.

The 24V output of the I/O module can be used as an active signal for the PLC inputs and outputs.

4.2 Function

The I/O module is a device interface between the leak detector and an external controller. The I/O module is equipped with

- one RS-232 connection
- one RS-485 connection
- one analog input
- ten digital inputs
- two analog outputs
- eight digital outputs

The actual function is determined by the software of the connected leak detector.

4.3 Technical data

Mechanical data

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

	BM1000 PROFIBUS
Dimensions (lxwxh)	107,6 mm x 89,7 mm x 76,6 mm

	IO1000
Dimensions (lxwxh)	107,6 mm x 89,7 mm x 76,6 mm

Electrical data

	CU1000 Display unit
Memory capacity for measured data	16 MB

	BM1000 PROFIBUS
Protection class	IP20

	IO1000
Protection class	IP20

Ambient conditions

	CU1000 Display unit
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

	BM1000 PROFIBUS
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

	IO1000
Max. altitude above sea level	2000 m
Max. relative humidity	0,5
Max. relative humidity above 40 °C	0,5
Max. relative humidity from 31 °C to 40 °C	80% to 50% (linear abfallend)
Max. relative humidity to 40 °C	0,8
Max. storage temperature	-20 °C - 60 °C
Pollution degree	II

5 Installation and removal

5.1 Mount I/O module on DIN-TS35 top hat rail

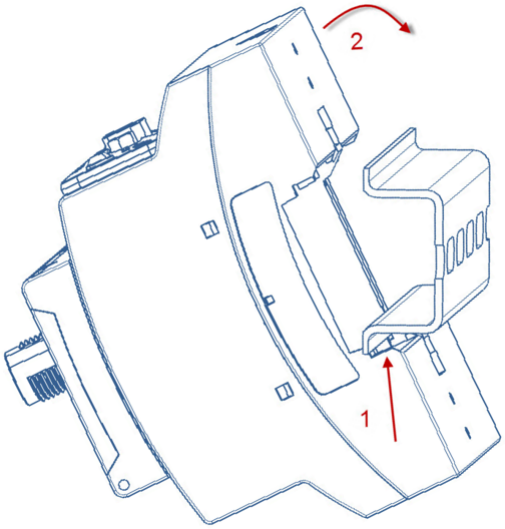

Fig. 6: Mounting of I/O module

1. Hook device on top hat rail at bottom.
2. Press device onto top hat rail at top.

5.1.1 Establish connections

Connecting I/O module with leak detector

The I/O module communicates via data cable with the leak detector and is supplied with voltage by the data cable.

1. Connect I/O module (connection “LD”) via data cable with leak detector (connection “I/O Anybus”).
2. Connect I/O module via desired interfaces with external controller:

– RS232 (RS-232-interface)

– RS485 (RS-485-interface)

– Analog In (analog input)

– Analog Out (analog outputs)

– PLC In (digital inputs)

– PLC Out (digital outputs)

5.2 Remove the I/O module from the DIN-TS35 top hat rail

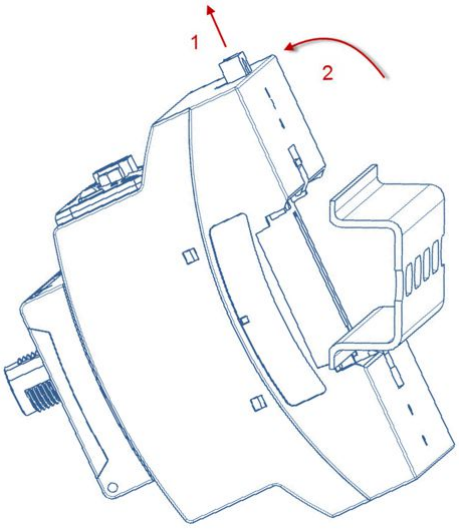

Fig. 7: Removing the I/O module

1. Use the flat-tip screwdriver to pull out the locking device.
2. Pull the device off of the top hat rail.

6 Disposal

The operator can dispose of the device or it can be sent to INFICON.

The device consists of materials that can be recycled. This option should be exercised to prevent waste and also to protect the environment.

► For disposal, always comply with local and regional environmental and safety regulations.