



Original operating instructions

IRwin[®] S/SX/SXT/SXG/SXGT

Portable Methane Leak Detector

Catalog No.

580-000, 580-010, 580-015, 580-020, 580-030

From software version

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1 About these instructions

This document applies to the software version stated on the title page.

Product names may occur in the document, which are added for identification purposes only and belong to the respective owner of the rights.

1.1 Target groups

These Operating Instructions are written for trained and experienced gas pipeline survey operators.

1.2 Warnings



⚠ DANGER

Imminent hazard 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

1.3 Patents

- | | |
|--------------|--------------|
| • US10309859 | • US10436708 |
| • US10309943 | • US10866225 |
| • US10352848 | • US11009422 |

+ Patents pending

2 Safety

2.1 Intended use

IRwin Methane Leak Detector is intended for professional use in residential and commercial areas. The operation of the equipment requires sufficient knowledge and experience in gas pipeline inspection. The different IRwin versions are equipped for the measurement of different gases, see "Technical data [▶ 21]", as well as for the applications listed below:

- IRwin S
Universal leak survey and pin-pointing in non-hazardous/not Ex classified areas.
DVGW modes: Above Ground, Bar hole
- IRwin SX (EX certified)
LEL measurement, Universal leak survey and pin-pointing in hazardous Ex classified areas.
DVGW modes: Above Ground, Bar hole, Plant, House, Gas Purity, Ex
- IRwin SXT (EX certified)
LEL measurement, Toxic gas alarm, Universal leak survey and pin-pointing in hazardous Ex classified areas.
DVGW modes: Above Ground, Bar hole, Plant, House, Gas Purity, Ex, Ex Tox
- IRwin SXG (EX certified)
LEL measurement, GC gas source analysis, Universal leak survey and pin-pointing in hazardous Ex classified areas.
DVGW modes: Above Ground, Bar hole, Plant, House, Gas Purity, GC Ethane Analysis
- IRwin SXGT (EX certified)
LEL measurement, GC gas source analysis, Toxic gas alarm, Universal leak survey and pin-pointing in hazardous Ex classified areas.
DVGW modes: Above Ground, Bar hole, Plant, House, Gas Purity, GC Ethane

IRwin SX, IRwin SXG, IRwin SXT, IRwin SXGT and the included original INFICON hand probe (partnumber 580-100), see "Probes [▶ 15]" are intrinsically safe and can be used in areas with potentially explosive atmospheres according to the EX rating and EX application it is certified for (see "EX certification (intrinsic safety) [▶ 23]").

These models are jointly referred to as **IRwin SXnn** in the following.

IRwin S and accessories other than the included, original INFICON hand probe are not EX certified.

Pay attention to the safety instructions "Safe operation [▶ 12]".

- You must assemble, operate and maintain the equipment only in compliance with these operating instructions.

Improper use

- Use only within the allowed ambient conditions. Operating or storing the equipment outside the given range can result in erroneous readings and possible malfunction.
- Use the leak detector exclusively for the detection of the specified gases.
- Do not suck liquids into the leak detector.
- Do not suck dirt or sand into the leak detector.
- Do not use IRwin S in areas with potentially explosive atmospheres.

See also

- 📄 Technical data [▶ 21]
- 📄 EX certification (intrinsic safety) [▶ 23]

2.2 Special conditions for safe use

2.2.1 Intrinsic Safety (Ex protection)

IRwin is certified intrinsically safe to prevent ignition of flammable atmospheres.

IRwin holds an ATEX certificate for EU and corresponding certificates for several other regions.

For details of rating, see EX certification (intrinsic safety) [▶ 23].

The "X" after the respective type certificate number relates to the following special conditions for safe use:

Applied standards are listed in the EU declaration of conformity "Declarations of conformity [▶ 106]".

The only device allowed to be connected to the charging socket on any of the models

- IRwin SX
- IRwin SXT
- IRwin SXG
- IRwin SXGT

is the Ex Certified IRwin Charging adapter (PN 580-604).

The charger or car adapter is subsequently connected to the inlet of the Ex Certified IRwin Charging Adapter.

This means that the charger for IRwin S must, under no circumstances, be connected directly to the charging socket on any of IRwin models SX, SXT, SXG, and SXGT. See also Charging the battery [▶ 37].

IRwin SXnn is certified as intrinsically safe at an ambient temperature of -20 - +50°C. Further temperature restrictions apply to oxygen and toxic gas measurement of IRwin SXT and SXGT. See Certified Gas Measurement.

IRwin SXnn is certified for use in Gas groups IIA, IIB and IIC (excluding Acetylene) and in Zones 0, 1 and 2 "Declarations of conformity [► 106]".

WARNING

IRwin must not be used in applications where there is risk for exposure to acetylene.

- ▶ Avoid also storage in potential acetylene atmospheres.
- ▶ If used in Acetylene atmospheres, Acetylides, prone to ignition by friction impact, can potentially form on the bronze filters in the reference inlet and exhaust.

The external surface of the enclosure is therefore slightly conductive to prevent electrostatic charging and sparks. Labels, ink or paint added for marking purposes must not be larger than 400 mm². Adding larger labels invalidates the Ex certifications due to risk for electrostatic charging and discharging.

Traduction française pour CANADA

Le X après le numéro de certificat ATEX concerne les conditions particulières suivantes pour une utilisation en toute sécurité:

Le seul accessoire autorisé à être connecté à la prise de charge sur l'un des modèles

- IRwin SX
- IRwin SXT
- IRwin SXG
- IRwin SXGT

est l'adaptateur de recharge Ex certifié IRwin (PN 580-604).

Le chargeur ou l'adaptateur de voiture est ensuite connecté à l'entrée de l'adaptateur de recharge.

Le chargeur pour IRwin S ne doit en aucun cas être connecté directement à la prise de charge de l'un des modèles IRwin SX, SXT, SXG ou SXGT.

AVERTISSEMENT

IRwin ne doit pas être utilisé dans des applications où il existe un risque d'exposition à l'acétylène

- ▶ Eviter également le stockage dans des atmosphères potentielles d'acétylène.
- ▶ S'ils sont utilisés dans des atmosphères d'acétylène, les acétylures, susceptibles de s'enflammer par impact de friction, peuvent potentiellement se former sur les filtres en bronze dans l'entrée et l'échappement de référence.

La surface externe du boîtier est dissipative pour éviter les charges électrostatiques et les étincelles. Les étiquettes, encres ou peintures ajoutées à des fins de marquage ne doivent pas dépasser 400 mm². L'ajout d'étiquettes plus grandes invalide les certifications Ex en raison du risque de charge et de décharge électrostatique.

2.2.2 Certified Gas Measurement

Certified %LEL Measurement

The Ex and ExTox modes of IRwin SX, SXT, SXG and SXGT models are certified by TÜV Rheinland to IEC 60079-29-1 for measuring flammability level (LEL) of Methane, Propane or Butane (as selected in settings).



WARNING

The LEL values displayed in the Universal and Universal+ modes are calculated from the gas level measured in the non-certified Universal mode.

This value is not compliant with or certified to IEC 60079-29-1 and must not be used for safety clearance.

Certified Oxygen Concentration Measurement

The ExTox mode of IRwin SXT and IRwin SXGT is certified by TÜV Rheinland to EN 50104 for measuring Oxygen (O₂).



WARNING

The O₂ concentration displayed in the Universal+ mode is a displacement calculation based on the measured natural gas concentration.

This value is not compliant with or certified to EN50104 and must not be used for safety clearance.

Certified Toxic Gas Concentration Measurement

The ExTox mode in IRwin SXT and IRwin SXGT is furthermore certified by TÜV Rheinland to EN 45544 for measuring Carbon Dioxide (CO₂), Carbon Monoxide (CO) and Hydrogen Sulfide (H₂S).

The certification is valid in an ambient temperature of -15 to +40°C and subject to periodic calibration checks (called function test in this manual) and if required calibration adjustments (called Calibration in this manual), see "Setting the Function Test Interval [▶ 51]" and "Calibration (adjustment) [▶ 81]".

IRwin S, IRwin SX and IRwin SXG are operable within -20 to +50°C. The certification is valid in an ambient temperature of -15 to +40°C. The accuracy may not be according to specification outside this range.

IRwin SXT and IRwin SXGT are operable within -20 to +40°C. The certification is valid in an ambient temperature of -15 to +40°C.

2.3 Owner/supervisor responsibilities

The following notes are for organizations or any person responsible for the safe and effective use of this equipment.

Safety conscious operation

- Check that the leak detector is properly calibrated and not damaged before using it.
- Make sure you operate the leak detector in accordance with this manual.
- Adhere to the following regulations:
 - Intended use
 - General applicable safety and accident prevention regulations
 - International, national and local standards and guidelines
 - Additional equipment-related provisions and regulations
- Use only original parts or parts approved by the manufacturer.
- Keep this instruction manual available on site.
- It is recommended that EN/IEC 60079-29-2 is observed to guarantee proper use and continued proper function of IRwin when used in Ex or ExTox modes.

It is also recommended that IRwin is submitted for yearly service at an approved service site.

Contact your supplier for contact details.

EN/IEC 60079-29-2: (Explosive atmospheres – Gas detectors – Selection, installation, use and maintenance of detectors for flammable gases and oxygen)

Staff qualifications

- Only properly trained staff should be permitted to work with and on the equipment. The training must cover the actual equipment model used.
- Make sure that users have read and understood the operating instructions and all other applicable documents.

Non-authorized repairs forbidden

The manufacturer (INFICON) denies all responsibility for the compliance of this product with any of the type certificates for this product if any repairs or service involving opening the instrument enclosure (yellow box) has been performed by individuals or organizations not qualified therefore in writing by INFICON AB, Sweden. The manufacturer (INFICON) denies all responsibility for the compliance of this product with any of the type certificates for this product if the equipment is used in any way not conforming to the instructions in this User Manual. Replacement of externally accessible parts such as probes and filters is allowed with the exception of the Hand Probe and the hose between Hand Probe and IRwin detector. These two parts are certified anti-static and must not be replaced with non-original parts.

2.4 Duties of the operator

- Read, observe, and follow the information in this manual and in the work instructions provided by the owner. This concerns in particular the safety instructions and warnings.
- Always observe the complete operating instructions for all work.
- If you have any questions about operation or maintenance that are not answered in this manual, please contact Customer Service.

2.5 Safe operation

Hazards due to chemical substances and explosive gases

- Do not expose the leak detector to excess heat or a naked flame.
- Aggressive substances such as solvents and other chemicals can damage the equipment.
- Adhere to the restrictions of use.
- Do not suck liquids into the leak detector. Proper maintenance of all filters reduces this risk.

Operation mode and Ex

The safety related modes Ex and Ex Tox has certified safety features. The detector monitors its functionality and proper function is indicated by an acoustic alive signal beeping every 20 s and by the LED being green. This requires that the accuracy of leak detector is verified by function test (and calibrating when required) according to the instructions and intervals stated in this manual.

If the signal LED is red, this indicates an alarm or an error.

Green LED and short beep every 20 s: Function OK.

Red LED: Gas alarm or instrument error.

Yellow LED: Special state Special state indicates functioning system but alarms are typically not active. This special state may occur for example during calibration or when changing a setting in the leak detector.

IRwin Methane Leak Detector was built according to the state-of-the-art and the recognized safety regulations. Nevertheless, improper use may result in risk to life and limb on the part of the user or third parties, or damage to the leak detector or other property may occur.

3 Description

3.1 Function

IRwin is a portable methane leak detector for survey, leak pinpointing, maintenance and commissioning checks of any utility gas or landfill installation or pipeline. It measures following gases depending on the leak detector version:

- Methane
- Carbon dioxide
- Ethane
- Propane
- Butane
- Oxygen
- Hydrogen sulfide
- Carbon monoxide

Below are some of the more common probes available for the leak detector. New accessories are added continuously to fit different applications and markets. See INFICON IRwin accessories on INFICON home page.

- Carpet probe is used for surveying paved or smooth surfaces. Pull or push the carpet along the surface.
- Use bell probe for measuring gas at specific points. Press the bell firmly down to pull gas through the surface.
- Hand probe is used for checking features on or in buildings. Hand probe also constitutes the handle for carpet probe and bell probe.
- Bar Hole probe is used to sample air from drilled holes. Push into hole and tighten screw to expand rubber before connecting sample line.
- Optional Hand Probe Flexible Extension can be connected to the hand probe or rod for easier access.
- Swan Neck Probe is used on uneven surfaces and in bushes etc.
- Flexi Bell is used for simple survey including meters and piping. The bell adapts to pipe geometry.

INFICON single-cell wide range technology (patent pending)

IRwin methane leak detector uses the unique INFICON single-cell wide range technology for detecting all concentrations from 1 ppm to 100 Vol% methane. This technology is very sensitive to the ethane content of natural gas. Therefore, large deviations can occur at higher methane concentrations if the ethane concentration is not compensated for. The instrument has built-in routines for ethane compensation. The actual ethane concentration can be determined using the IR Ethane Analysis function. This can be used to automatically set the compensation concentration. If

preferred you can instead set the ethane content manually. The safety certified modes Ex and Ex Tox are not affected by this phenomenon. See "IR Ethane Analysis and compensation [▶ 77]".



IRwin SXG and SXGT models also have GC Ethane Analysis capability for distinguishing between Natural gas (NG), liquid petroleum gas (LPG) and swamp gas by determining the presence of methane, ethane and propane in the sampled gas.

The GC Ethane Analysis function is not affecting the ethane compensation.

3.2 Design of the leak detector



Fig. 1: Design of the Leak Detector

1	Reference inlet	4	Gas outlet
2	Display	5	Charging socket
3	Gas inlet		

3.3 Probes

WARNING

Risk of explosion due to not approved probe parts.

The original INFICON Hand probe (part number 580-100) is the only part of the probe system that is certified for use in potentially explosive areas. Other parts of the probe system are not allowed in classified hazardous areas (Zone 0, 1, 2, Div 1 or 2).

- ▶ Pay proper attention to safety when using other accessories for locating and pinpointing gas leaks in none classified areas.

Carpet probe

When you are looking for gas leaks on paved surfaces, use the INFICON Carpet probe. Pull or push the INFICON Carpet probe along the surface.



Fig. 2: Carpet probe

Bell probe

When searching for or measuring gas leaks at particular spots, use the INFICON Bell probe. This can be used to pull gas through most pavings. It is also suitable for emergency testing if surface is wet.



Fig. 3: Bell probe

Hand probe

You can use the INFICON Hand probe to search for gas in building installations. The hand probe also constitutes the handle for the INFICON Carpet probe and for the INFICON Bell probe.



Fig. 4: Hand probe

Insertion Probe

The INFICON Insertion Probe is designed mainly for sampling narrow positions like behind panels indoors or through door gaps for entry clearance.

The probe comes in two versions:

- Short with OD 4 mm flexible tip
- Long with OD 8 mm semi rigid tip

Replacements tips are offered separately.



Fig. 5: Insertion Probe

Hand probe

The INFICON Flexible extension is practical when locating leaks in hard to reach installations. Use the INFICON Extension Connector to attach it to the long rod to reach even further.



Fig. 6: Hand Probe Flexible Extension

Swan Neck

The INFICON Swan Neck is used on uneven surfaces where the carpet probe is unpractical. Can also be practical in bushes and other “confined” areas.



Fig. 7: Swan Neck

Flexi Bell

The INFICON Flexi Bell is practical for surveys including frequent entries into gardens and check of meters and piping. The softer bell adapts to pipe geometry.



Fig. 8: Flexi Bell

3.4 Display

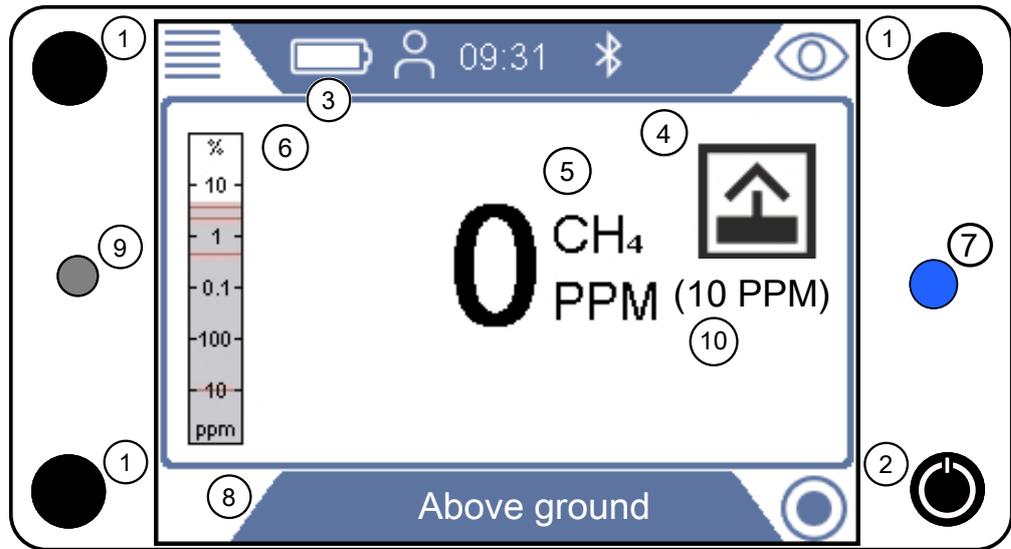


Fig. 9: Display IRwin

1	Navigation buttons	2	Navigation and on / off button
3	Battery status indicator	4	Mode icon
5	Measured value, target gas and unit	6	Measurement range (in % or PPM CH ₄ depending on the operation mode)
7	Status indicator LED	8	Operation mode and menu bar
9	Buzzer	10	PPM threshold in Universal, Above Ground and Plants modes.

Navigation buttons

	Menu	Upper left
	Settings	Upper left after pressing "Menu"
	Operation	Upper right
	Information	Lower left after pressing "Menu"
	Diagnosis	At lower right after pressing "Menu"

Table 1: Navigation buttons

To select a menu, press the navigation button to go to desired tab or field.

Press check mark button , select or open a highlighted option.

Function buttons		OK/Select/Confirm
		Navigation buttons (in this case go right)
		Cancel process
		Start process
		Start data logging
		Stop data logging
		Mute the alarm

Table 2: Function buttons

Symbols of the status bar		Bluetooth® activated
		Symbol ON = GPS connected and tracking Symbol flashing = GPS not connected
		Battery status indicator
	<p>The color of the battery status indicator shows the remaining runtime before shutdown:</p> <p>White: > 1 h remaining</p> <p>Orange: < 1 h remaining</p> <p>Red flashing: < 10 min remaining</p>	
Progress bars for calibration processes etc.		
	White bar: Process has not yet started	
	Light green bar: Process running	
	Dark green bar: Process completed	
	Red bar: Process failed	

Table 3: Status indicators

- Mode icons**
-  Operation mode - Above Ground
 -  Operation mode - Bar hole
 -  Operation mode - Plants
 -  Operation mode - House
 -  Operation mode - Gas Purity
 -  Operation mode - Ex
 -  Operation mode - Ex Tox
 -  Operating mode - IR Ethane Analysis
 - Operating modes - Universal and Universal+

Permission levels	Symbol	Permission level	Default password
		Basic	none
		Intermediate	1111
		Advanced (Supervisor)	1422

Table 4: Permission levels

Status LED

Green	<ul style="list-style-type: none"> Leak detector is charging normal (power off) Normal operation in the modes Ex and Ex Tox.
Cyan	Leak detector is charging fast.
Blue	Normal operation (in all operation modes except Ex and Ex Tox)
Red	<ul style="list-style-type: none"> Alarm Error message
Yellow	The leak detector is in a state in which functions like for example alarms could be disabled. For example, during warm up or calibration.

Table 5: Status LED

3.5 Technical data

Mechanical data

	580-000	580-010	580-015	580-020	580-030
Name	IRwin S	IRwin SX	IRwin SXT	IRwin SXG	IRwin SXGT
Weight	1.4 kg (3 lb.)	1.6 kg (3.5 lb.)	1.6 kg (3.5 lb.)	1.6 kg (3.5 lb.)	1.6 kg (3.5 lb.)
Dimensions (lxwxh)	197 x 256 x 62 mm (6.6 x 9.7 x 2.3 in.)	197 x 256 x 62 mm (6.6 x 9.7 x 2.3 in.)	197 x 256 x 62 mm (6.6 x 9.7 x 2.3 in.)	197 x 256 x 62 mm (6.6 x 9.7 x 2.3 in.)	197 x 256 x 62 mm (6.6 x 9.7 x 2.3 in.)

Table 6: Mechanical data

Electrical data

	580-000	580-010	580-015	580-020	580-030
Name	IRwin S	IRwin SX	IRwin SXT	IRwin SXG	IRwin SXGT
Power input	4 A	4 A	4 A	4 A	4 A
Log memory	64 Mb				
IP class	IP54*	IP54*	IP54*	IP54*	IP54*
Electronic interfaces	Bluetooth 3.0 Class 1				
Battery operating time	8 h as verified during certification, typical value 9 h	8 h as verified during certification, typical value 9 h	8 h as verified during certification, typical value 9 h	8 h as verified during certification, typical value 9 h	8 h as verified during certification, typical value 9 h
Battery charging time	4 h from empty to full charge (3 h for fast charging). 4 hours operation by 1 hour fast loading	4 h from empty to full charge (3 h for fast charging). 4 hours operation by 1 hour fast loading	4 h from empty to full charge (3 h for fast charging). 4 hours operation by 1 hour fast loading	4 h from empty to full charge (3 h for fast charging). 4 hours operation by 1 hour fast loading	4 h from empty to full charge (3 h for fast charging). 4 hours operation by 1 hour fast loading
Battery	Lithium-Ion, 10.0 Ah / 7.2 V / 73 Wh	Lithium-Ion 10.0 Ah / 7.2 V / 73 Wh	Lithium-Ion 10.0 Ah / 7.2 V / 73 Wh	Lithium-Ion 10.0 Ah / 7.2 V / 73 Wh	Lithium-Ion 10.0 Ah / 7.2 V / 73 Wh

Table 7: Electrical data

*)The instrument may malfunction during and after exposure to dust and water as allowed by the IP54 rating. The exposure can result in blockage of flow paths. If this happens, the detector will alarm for blocked flow and filter may need replacement.

Once the fault is fixed there is no need for new calibration but a low concentration function test is recommended.

Physical data

	580-000	580-010	580-015	580-020	580-030
Name	IRwin S	IRwin SX	IRwin SXT	IRwin SXG	IRwin SXGT
Noise level	< 70 dB (A)	< 70 dB (A)	< 70 dB (A)	< 70 dB (A)	< 70 dB (A)
Detectable gases	Methane, ethane, propane, butane, carbon dioxide	Methane, carbon dioxide, ethane, propane, butane	Methane, carbon dioxide, ethane, propane, butane, oxygen, hydrogen sulfide, carbon monoxide	Methane, carbon dioxide, ethane, propane, butane	Methane, carbon dioxide, ethane, propane, butane, oxygen, hydrogen sulfide, carbon monoxide
Gas flow through sniffer line	Typically 60 l/h	Typically 60 l/h	Typically 60 l/h	Typically 60 l/h	Typically 60 l/h

Table 8: Physical data

Ambient conditions

	580-000	580-010	580-015	580-020	580-030
Name	IRwin S	IRwin SX	IRwin SXT	IRwin SXG	IRwin SXGT
Max. altitude above sea level	2000 m	2000 m	2000 m	2000 m	2000 m
Permissible ambient temperature (during operation)	-20° - +50°C (-4 - 122°F)	-20 - 50°C (-4 - 122°F)	-15 - 40°C (-5 - 104°F)	-20 - 50°C (-4 - 122°F)	-15 - 40°C (-5 - 104°F)
Storage temperature	-25 - +70°C (-13 - 158°F)	-25 - 70°C (-13 - 158°F)			
Pressure range	80 kPa - 120 kPa	80 kPa - 120 kPa	80 kPa - 120 kPa	80 kPa - 120 kPa	80 kPa - 120 kPa
Max. relative humidity	95% (non-condensing)	95% (non-condensing)	95% (non-condensing)	95% (non-condensing)	95% (non-condensing)

Table 9: Ambient conditions

3.5.1 EX certification (intrinsic safety)

Type certificates

IRwin models SX, SXT, SXG and SXGT are certified intrinsically safe according to the following certificates:

EU: Baseefa16ATEX0034X

International: IECExSP16.0001X

UK: BAS21UKEX0575X

USA/CAN: CSA 70095939

China: NEPSI GYJ22.1861X

IRwin S (PN 580-000) is not certified intrinsically safe!

The products:

- IRwin SX 580-010,
- IRwin SXT 580-015,
- IRwin SXG580-020,
- IRwin SXGT580-030,

are Ex certified with rating according to the following table. IRwin S 580-000 is not Ex certified.

EX rating

EX rating	Ex ia IIC T3, T _{amb} : -20°C - +50°C,  II 1G (EPL Ga) USA: Intrinsically safe, Class I, Division 1, Groups B, C and D.
EX ranges of applications	<ul style="list-style-type: none"> • Zones: 0, 1 and 2 • Gas groups: IIA, IIB and IIC • Temperature classes: T1, T2 and T3 • USA: Zone 0, Class I, Division 1, Groups B, C and D.

Table 10: EX rating

Applied standards are listed in the EU declaration of conformity "Declarations of conformity [▶ 106]".

3.5.2 Sensors

Basic sensor data

Gas (measurement range)	Sensor	Warm up time
CH ₄ , C ₃ H ₈ , C ₄ H ₁₀	Infrared (IR)	< 30 s
CO ₂	Infrared (IR)	< 30 s
O ₂ , CO, H ₂ S	Electrochemical	< 120 s O ₂ sensor: 1 - 12 hours if stored with flat battery.

Sensor performance data

The calibration gases defined below are the typical gases and gas mixes used to calibrate the different modes. For optimum performance adjust these settings to the actual concentrations of the gases used. See "Calibration (adjustment) [[▶ 81](#)]".

Universal mode

This mode is available if Universal Mode option is selected, See Operating modes Universal and Universal+ [▶ 56].

Measurement principle	Infrared (IR)
Measurement range	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : 1 ppm - 100 Vol% The following is also displayed when total NG is above 2.7 Vol%: C ₂ H ₆ content in NG: 0.5 - 8 Vol% CO ₂ : 0.1 - 20 Vol%
Resolution	CH ₄ : 1 ppm (0 - 100 ppm), 10 ppm (110 - 990 ppm), 0.1 Vol% (0.1 - 10 Vol%), 1 Vol% (>10 Vol%) CO ₂ : 0.1 Vol% (0.1 - 10 Vol%), 1 Vol% (>10 Vol%) C ₂ H ₆ : 0.1 Vol% (Auto test) 0.5 Vol% (manual selection)
Measurement error	CH ₄ : +5/-2 ppm (<20 ppm), ±10 % (20 - 50 ppm), ±5 % (50 ppm - 2.2 Vol%), ±20 % (2.2 - 2.7 Vol%), ±3 Vol% (>2.7 Vol%) CO ₂ : ±1% Vol% (<10 Vol%), ±20% (>10 Vol%)
Response time	t ₅₀ <3 s (<2.7 Vol%), <5 s (>2.7 Vol%), t ₉₀ <5 s (<2.7 Vol%), <10 s (>2.7 Vol%)
Recovery time	t ₅₀ <3 s (<2.7 Vol%), <5 s (>2.7 Vol%), t ₁₀ <5 s (<2.7 Vol%), <10 s (>2.7 Vol%)
Cross sensitivity	All hydrocarbons C _x H _y CO ₂ and H ₂ O: Negligible
Lifetime	Guaranteed 1 year, expected > 2 years
Calibration gases	Fresh air, CH ₄ in synthetic air: 10 ppm, 100 ppm 50% LEL (2.2% or 2.5% depending on region setting), 100 Vol% CO ₂ , 20 Vol%

Note: IRwin allows other concentrations and reduced number of gases. The measurement error may fall outside specification if choosing other set-up than the recommended.

Universal+ mode

This mode is available if Universal+ option is selected, see "Operating modes Universal and Universal+ [► 56]".

Measurement principle	Infrared (IR)
Measurement range	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : 1 ppm - 100 Vol%* % LEL displayed in three ranges**: < 2 %LEL 2 - 100 %LEL >100 %LEL
Resolution	CH ₄ : 1 ppm (0 - 100 ppm), 10 ppm (110 - 990 ppm), 0.1 Vol% (0.1 - 10 Vol%), 1 Vol% (>10 Vol%) CO ₂ : 0.1 Vol% (0.1 - 10 Vol%), 1 Vol% (>10 Vol%) %LEL: 1 %LEL (2 - 100 %LEL) O ₂ : 0.1 Vol%
Measurement error	CH ₄ : +5/-2 ppm (<20 ppm), ±10 % (20 - 50 ppm), ±5 % (50 ppm - 2.2 Vol%), ±20 % (2.2 - 2.7 Vol%), ±3 Vol% (>2.7 Vol%) %LEL: ±20 % ** O ₂ : ±1 Vol% up to 25 Vol% CH ₄ ***
Response time	t ₅₀ <3 s (<2.7 Vol%), <5 s (>2.7 Vol%), t ₉₀ <5 s (<2.7 Vol%), <10 s (>2.7 Vol%)
Recovery time	t ₅₀ <3 s (<2.7 Vol%), <5 s (>2.7 Vol%), t ₁₀ <5 s (<2.7 Vol%), <10 s (>2.7 Vol%)
Cross sensitivity	Several hydrocarbons C _x H _y CO ₂ and H ₂ O: Negligible
Lifetime	Guaranteed 1 year, expected > 2 years
Calibration gases	Fresh air, CH ₄ in synthetic air: 10 ppm, 100 ppm 50% LEL (2.2% or 2.5% depending on region setting), CH ₄ : 100 Vol% and CO ₂ , 20 Vol%#

* The unit changes with concentration. Unit is ppm up to 990 ppm, then changing to %LEL from 2 %LEL and then Vol% above 100 %LEL.

If UK English is selected in Startup Settings, unit will be GIA (Gas in Air, EM72) from 20 %LEL to 100 % LEL.

** The %LEL values presented in the Universal+ mode are not certified to IEC 60079-29-1 and must not be used for safety clearance, see "Certified Gas Measurement [► 10]".

*** The O₂ concentration displayed in the Universal+ mode is a displacement calculation based on the measured natural gas concentration.

This value is not compliant with or certified to EN50104 and must not be used for safety clearance, see "Certified Gas Measurement [▶ 10]":

Reduced number of gases can be used, see "Concentration of calibration and test gases [▶ 35]" and, see "Setting of calibration gas concentrations [▶ 85]":

Above ground mode:

This mode is not available if Universal mode option is activated.

Measurement principle	Infrared (IR)
Measurement range	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : 1 ppm - 5 Vol%
Resolution	1 ppm (0 - 100 ppm), 10 ppm (110 - 990 ppm), 0,1 Vol% (0,1 - 5 Vol%)
Measurement error	+5/-2 ppm (<20 ppm), ±10% (20 - 50 ppm), ±5% (50 ppm - 2.2 Vol%), ±20% (2.2 - 5 Vol%)
Response time	t ₅₀ <3 s, t ₉₀ <5 s
Recovery time	t ₅₀ <3 s, t ₁₀ <5 s
Cross sensitivity	All hydrocarbons C _x H _y
Lifetime	Guaranteed 1 year, expected > 2 years
Calibration gases	Fresh air, CH ₄ in synthetic air: 10 ppm, 100 ppm, 50% LEL (2.2% or 2.5% depending on region setting)

Bar hole mode:

This mode is not available if Universal mode option is activated.

Measurement principle	Infrared (IR)
Measurement range	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : 0.1 - 100 Vol% C ₂ H ₆ content in CNG: 0.5 - 8 Vol% CO ₂ : 0.1 - 20 Vol%
Resolution	CH ₄ & CO ₂ : 0.1 Vol% (0.1 - 1 Vol%), 1 Vol% (>1 Vol%) C ₂ H ₆ : 0.1 Vol% (Auto test) 0.5 Vol% (manual selection)
Measurement error	CH ₄ : ±3 Vol% CO ₂ : 1 Vol% (<10 Vol%), ±20% of value (>10 Vol%)
Response time	t ₅₀ <5 s, t ₉₀ <10 s
Recovery time	t ₅₀ <5 s, t ₁₀ <10 s
Cross sensitivity	All hydrocarbons C _x H _y CO ₂ : Negligible
Lifetime	Guaranteed 1 year, expected > 2 years
Calibration gases	Fresh air, CH ₄ in synthetic air: 50% LEL (2.2% or 2.5% depending on region setting), 100 Vol%. CO ₂ , 20 Vol%

GC Ethane Analysis mode:

Measurement principle	Gas Chromatography separation with semiconductor detector
Measurement range	1000 ppm gas needed in sample. This refers to total hydrocarbon content (i.e., natural gas, swamp gas or LPG etc.).
Capability	Can identify Natural Gas at 0.5% C ₂ H ₆ level. Automatic interpretation of result as either of: <ul style="list-style-type: none"> • NG with Ethane detected • Methane detected • LPG detected • Gas type not identified (given if result is not clear)
Cycle time*:	Typically 3.5 min total at 25 °C.
Lifetime	Separation column: Guaranteed 3 years, expected > 10 years Semiconductor sensor: Guaranteed 1 year, expected 3 years.

** Times given are valid after 1 h operation in given ambient temperature. Times include purge before and after analysis. Times are longer at lower temperatures.*

House mode:

This mode is not available if Universal mode option is activated.

Measurement principle	Infrared (IR)
Measurement range	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : 1 ppm - 100 Vol%
Resolution	1 ppm (0 - 100 ppm), 10 ppm (110 - 990 ppm), 0.1 Vol% (0.1 - 1 Vol%), 1 Vol% (>5 Vol%)
Measurement error	+5/-2 ppm (<20 ppm), ±10% (20 - 50 ppm), ±5% (50 ppm - 2.2 Vol%), ±20% (2.2 - 5 Vol%)
Response time	t ₅₀ <3 s, t ₉₀ <5 s
Recovery time	t ₅₀ <3 s, t ₁₀ <5 s
Cross sensitivity	All hydrocarbons C _x H _y
Lifetime	Guaranteed 1 year, expected > 2 years
Calibration gases	Fresh air, CH ₄ in synthetic air: 10 ppm, 100 ppm, 50% LEL (2.2% or 2.5% depending on region setting)

Plants mode:

This mode is not available if Universal mode option is activated.

Measurement principle	Infrared (IR)
Measurement range	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : 1 ppm - 5 Vol%
Resolution	1 ppm (0 - 100 ppm), 10 ppm (110 - 990 ppm), 0,1 Vol% (0,1 - 5 Vol%)
Measurement error	+5/-2 ppm (<20 ppm), ±10% (20 - 50 ppm), ±5% (50 ppm - 2.2 Vol%), ±20% (2.2 - 5 Vol%)
Response time	t ₅₀ <3 s, t ₉₀ <5 s
Recovery time	t ₅₀ <3 s, t ₁₀ <5 s
Cross sensitivity	All hydrocarbons CxHy
Lifetime	Guaranteed 1 year, expected > 2 years
Calibration gases	Fresh air, CH ₄ in synthetic air: 10 ppm, 100 ppm, 50% LEL (2.2% or 2.5% depending on region setting)

Gas Purity mode:

This mode is not available if Universal mode option is activated.

Measurement principle	Infrared (IR)
Measurement range	CH ₄ : 0.1 - 100 Vol%
Resolution	0.5 Vol% (0.5 - 1 Vol%), 1 Vol% (>1 Vol%)
Measurement error	±3 Vol%
Response time	t ₅₀ <5 s, t ₉₀ <10 s
Recovery time	t ₅₀ <5 s, t ₁₀ <10 s
Cross sensitivity	All hydrocarbons CxHy
Lifetime	Guaranteed 1 year, expected > 2 years
Calibration gas	Fresh air, CH ₄ in synthetic air: 50% LEL (2.2% or 2.5% depending on region setting), 100 Vol%

Ex mode:

This mode is not available in IRwin S.

Measurement principle	Infrared (IR)
Measurement range	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : 1 - 100% LEL
Resolution	1%LEL
Measurement error	±5%LEL
Response time	CH ₄ : t ₅₀ = 3 s, t ₉₀ = 5 s
Recovery time	t ₅₀ <3 s, t ₁₀ <5 s
Cross sensitivity	All hydrocarbons C _x H _y
Lifetime	Guaranteed 1 year, expected > 2 years
Calibration gas	Fresh air, CH ₄ in synthetic air: 50% LEL (2.2% or 2.5% depending on region setting)

Ex Tox mode:

This mode is only available in IRwin SXT and SXGT.

Measurement principle	Infrared (IR)
Measurement range	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : 1 - 100% LEL CO ₂ : 0.1 - 5 Vol% O ₂ : 0.1 - 25 Vol% CO: 1 - 500 ppm H ₂ S: 0.1 - 400 ppm
Resolution	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : 1% LEL CO ₂ : 0.05 Vol% O ₂ : 0.1 Vol% CO: 1 ppm H ₂ S: 0.1 ppm
Measurement error	CH ₄ : ±5 % LEL C ₃ H ₈ : ±40% of indicated value C ₄ H ₁₀ : ±50% of indicated value CO ₂ : ±0.1 Vol% O ₂ : ±0.3 Vol% CO: ±3 ppm H ₂ S: ±0.5 ppm
Response time	CH ₄ : t ₅₀ <3 s, t ₉₀ <5 s O ₂ : t ₅₀ <16 s, t ₉₀ <40 s

	CO: $t_{50} < 15 \text{ s}$, $t_{90} < 30 \text{ s}$ CO ₂ : $t_{50} < 12 \text{ s}$, $t_{90} < 36 \text{ s}$ H ₂ S: $t_{50} < 18 \text{ s}$, $t_{90} < 66 \text{ s}$
Recovery time	CH ₄ : $t_{50} < 3 \text{ s}$, $t_{10} < 5 \text{ s}$ CO ₂ : $t_{50} < 12 \text{ s}$, $t_{10} < 36 \text{ s}$ O ₂ : $t_{50} < 16 \text{ s}$, $t_{10} < 39 \text{ s}$ CO: $t_{50} < 15 \text{ s}$, $t_{10} < 30 \text{ s}$ H ₂ S: $t_{50} < 18 \text{ s}$, $t_{10} < 66 \text{ s}$
Sensitivity drift	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : $< \pm 5 \%$ LEL in 1 month CO ₂ : $< \pm 5 \%$ Vol% in 1 month O ₂ : $< \pm 1 \%$ Vol% in 3 months CO: $< \pm 4 \%$ in 12 months H ₂ S: $< \pm 2 \%$ in 12 months
Cross sensitivity	CH ₄ : All hydrocarbons C _x H _y . O ₂ : negligible CO: $< 12 \%$ of applied H ₂ S concentration, $< 8 \%$ of applied H ₂ concentration H ₂ S: $< 1.5 \%$ of applied CO concentration, $< 0.3 \%$ of applied H ₂ concentration CO ₂ : negligible
Lifetime	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀ : Guaranteed 1 year, expected > 2 years CO ₂ : Guaranteed 1 year, expected > 2 years O ₂ : Guaranteed 4 years, expected > 5 years CO: Guaranteed 2 years, expected > 3 years H ₂ S: Guaranteed 2 years, expected > 3 years
Calibration gas	Fresh air, ToxMix (CH ₄ 50% LEL (2.2% or 2.5% depending on region setting), CO ₂ 2 Vol%, CO 40 ppm, H ₂ S 40 ppm, O ₂ 0 Vol% in N ₂)

3.6 Factory settings

Parameter	Factory Setting	Options
Screen timeout (auto standby)	30 s	Off 5, 30 s 1, 2, 5, 10, 20, 30 min 1, 2
Brightness	10	1 -10

Parameter	Factory Setting	Options
Screensaver (IRwin S only)	enabled	enabled or disabled
PPM Adjustment Factor	1.0*	1.0, 1.2, 1.4, 1.6, 1.8, 2.0
Select Gas (Ex)	CH ₄	CH ₄ , C ₃ H ₈ , C ₄ H ₁₀
CH ₄ PPM Alarm	10 PPM*	3, 5, 10, 15, 20, 25, 50, 100, 500, 600, 700, 800, 900, 1000
CH ₄ AL1	10% LEL	3, 5, 10
CH ₄ AL2	50% LEL **	20, 30, 40, 50
CH ₄ AL3	100% LEL **	60, 70, 80, 90, 100
C ₃ H ₈ AL1	10% LEL	3, 5, 10
C ₃ H ₈ AL2	50% LEL	30, 40, 50
C ₃ H ₈ AL3	100% LEL	80, 90, 100
C ₄ H ₁₀ AL1	10% LEL	3, 5, 10
C ₄ H ₁₀ AL2	50% LEL	30, 40, 50
C ₄ H ₁₀ AL3	100% LEL	80, 90, 100
CO ₂ AL1	0.5 Vol%	0.1, 0.2, 0.3, 0.4, 0.5
CO ₂ AL2	1.0 Vol%	0.6, 0.7, 0.8, 0.9, 1.0
CO ₂ AL3	5 Vol%	1.0, 2.0, 3.0, 4.0, 5.0
CO ₂ STEL	1.0 Vol%	0.5, 0.6, 0.7, 0.8, 0.9, 1.0
CO ₂ LTEL	0.5 Vol%	0.1, 0.2, 0.3, 0.4, 0.5
CO AL1	30 ppm	10, 20, 30
CO AL2	60 ppm	40, 50, 60
CO AL3	500 ppm	100, 200, 300, 400, 500
CO STEL	30 ppm	10, 20, 30
CO LTEL	30 ppm	10, 20, 30
H ₂ S AL1	10 ppm	3, 5, 7, 10
H ₂ S AL2	20 ppm	10, 15, 20
H ₂ S AL3	100 ppm	50, 60, 70, 80, 90, 100
H ₂ S STEL	10 ppm	3, 5, 7, 10
H ₂ S LTEL	10 ppm	3, 5, 7, 10
O ₂ AL1	10 Vol%***	3, 5, 10, 12, 15
O ₂ AL2	18 Vol%***	16, 17, 18, 19, 20
O ₂ AL3	23 Vol%	21, 22, 23, 24, 25
Calibration reminder	Off	Off, 1 - 7, 14, 30, 60, 90 days

Parameter	Factory Setting	Options
Function test reminder	Off	Off, 2, 4, 8 h, 1, 3, 5, 7, 14, 30, 60, 90 days
100% CH ₄ LEL conc	4.4 Vol%*	4.4 Vol%, 5.0 Vol%
Deadband Suppression	Disabled	Disabled/ Enabled
Universal Mode	Disabled*	Disabled/ Enabled
AbG Cal Setup	Classic	Generic / Classic
AbG Fnc Test conc	10 ppm*	10 ppm, 500 ppm, 2.5%
Time	UTC +2 h*	-11 - +12 h.
Language	English*	English, Deutsch, Italiano, Nederlands, Polskie, Chinese
Ethane %	0%*	0 - 8% (in increments of 0.5%)
Log to file	enabled	enabled / disabled
Logging Interval (log file period)	3 s	1, 2, 3, 5, 10, 30 s, 1 min
Start Mode	Default (Ex or Above Ground for IRwin S)*	Default, Last Used, Ex, Ex Tox, Universal (if enabled), GC Ethane Analysis
Auto-rotate Screen	Off	On, Off
Reminder for Ethane Compensation Analysis	Off	Off, startup, always
Measuring duration (Auto bar hole)	10 s	10, 15, 20, 25, 30 s
Evacuation duration (Auto bar hole)	3 min	3, 4, 5, 10, 15 min
CO ₂ -limit at evacuation (Auto bar hole)	Off	Off, 1, 2, 3, 4, 5%

Table 11: Factory settings

* This parameter is set by the Startup Settings routine. See "Quick Set-up [► 44]".

** Factory settings in UK English setup are: 10, 20 and 80 % LEL.

*** Factory settings in UK English setup are: 12, 17 and 30 Vol% O₂.

3.7 Concentration of calibration and test gases

Calibration routine	Default gas	Adjustable range	Info
Ex (2.x% CH ₄)	2.2 Vol% CH ₄ *	2.0 - 2.7 Vol% in 0.1 Vol% increments	Select gas close to 50% LEL
Above Ground	10 ppm CH ₄	8 - 15 ppm in 0.1 ppm increments	All three gases required by DVGW.
	100 ppm CH ₄	80 - 1100 ppm in 1 ppm increments	One or two gases can be disabled if "AbG Cal Setup" is set to "Generic".
	2.2 / 2.5 Vol% CH ₄ *	1.0 -2.7 Vol% in 0.1 Vol% increments	
Universal (low range) Universal+ (low range)	10 ppm CH ₄	8 - 15 ppm in 0.1 ppm increments	Add for best accuracy below 20 ppm.
	100 ppm CH ₄	80 - 1100 ppm in 1 ppm increments	Recommended for landfill applications.
	2.2 / 2.5 Vol% CH ₄ *	1.0 -3.0 Vol% in 0.1 Vol% increments	Recommended for general survey.
Bar Hole CH ₄ and Universal (high range) Universal+ (high range)	2.2 Vol% CH ₄	2.0 - 2.7 Vol % in 0.1 Vol% increments	Select gas close to 50% LEL
	100 Vol% CH ₄	80 - 100 Vol% in 1 Vol% increments	
Bar Hole CO ₂ and Universal CO ₂	20.0 Vol% CO ₂	10.0 - 20.0 Vol% in 0.1 Vol% increments	
Ex Tox (Tox) Mixture of:	2.2 Vol% CH ₄ *	1.4 - 2.7 Vol% in 0.1 Vol% increments	Select gas close to 50% LEL
	2.0 Vol% CO ₂	0.5 - 3.0 Vol% in 0.1 Vol% increments	
	0 Vol% O ₂	0.0 - 18.0 Vol% in 0.1 Vol% increments	
	40 ppm H ₂ S	4 - 50 ppm in 1 ppm increments	
	40 ppm CO	20 - 160 ppm in 1 ppm increments	
	Balance: N ₂	Not applicable	
GC Function test mix: Option 1	1 Vol% CH ₄	Not applicable	Adjusts peak timing.
	50 ppm C ₂ H ₆	Not applicable	
	1000 ppm C ₃ H ₈	Not applicable	
GC Function test mix: Option 2	1 Vol% CH ₄	Not applicable	Adjusts peak timing.
	50 ppm C ₂ H ₆	Not applicable	

Calibration routine	Default gas	Adjustable range	Info
GC Function test mix: Option 3	1 Vol% CH ₄	Not applicable	Adjusts peak timing.
	200 ppm C ₂ H ₆	Not applicable	
GC Function test mix: Option 4	1 Vol% CH ₄	Not applicable	Adjusts peak timing. Only option in US English setting.
	200 ppm C ₂ H ₆	Not applicable	
	1000 ppm C ₃ H ₈	Not applicable	

Table 12: Concentration of calibration and test gases

Balance gas is Synthetic Air if nothing else stated (Ex Tox balance is N₂).

Water content in all gases should be below 10 ppm.

* This parameter is set by the Startup Settings routine. See Initial setup.

4 Getting started

4.1 Charging the battery

WARNING

Explosion hazard

The equipment for charging IRwin is not ATEX certified/ex-protected.

- ▶ Never charge IRwin (all models) in potentially explosive atmospheres.
-

WARNING

Using the wrong charger could damage the explosion protection of IRwin SXnn models.

The only equipment allowed to be connected to the Charging socket of any of IRwin SXnn models is the Ex Certified IRwin Charging Adapter.

- ▶ Connect this adapter to the leak detector first and then connect the charger or car cable to the adapter.
-

NOTICE

Fast charging reduces the lifetime of the battery.

The ambient temperature during the charging process should be between 10 and 30°C.

- ▶ Do not use fast charging regularly.
-

Accessories for charging for IRwin S up to serial number 929000704

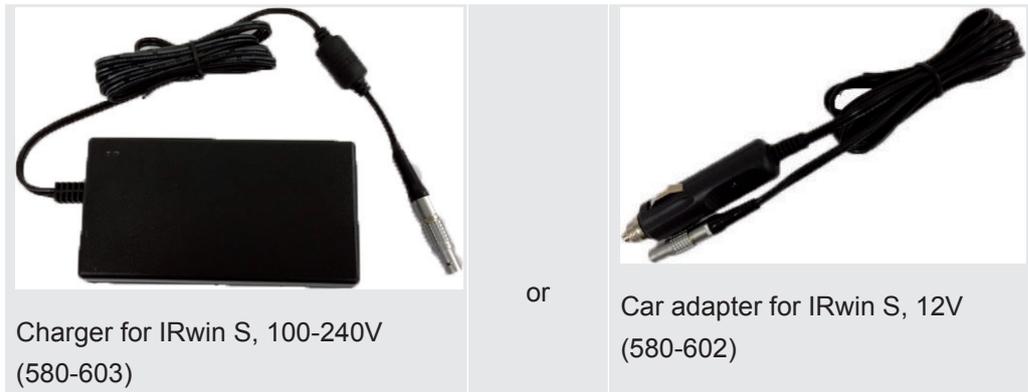


Table 13: Accessories for charging for IRwin S up to serial number 929000704

Charge IRwin S

- 1 Switch off IRwin S.
 - 2 Connect the "Charger for IRwin S, 100-240V (580-603)" or "Car adapter for IRwin S, 12V (580-602)" to the charging inlet of IRwin S. Align the red marks of the charging socket and charging plug with each other.
- ⇒ The status LED is green when the battery charges normal.

Fast charging IRwin S

- 1 For charging the leak detector faster switch on the IRwin S.
 - 2 Connect the "Charger for IRwin S, 100-240V (580-603)" or "Car adapter for IRwin S, 12V (580-602)" to the charging inlet of IRwin S.
 - 3 Select fast charge when the pop-up is shown on the display.
- ⇒ The signal LED is turquoise when the battery is charging at a fast rate.

Accessories for charging for IRwin SXnn and IRwin S from serial number 929000705

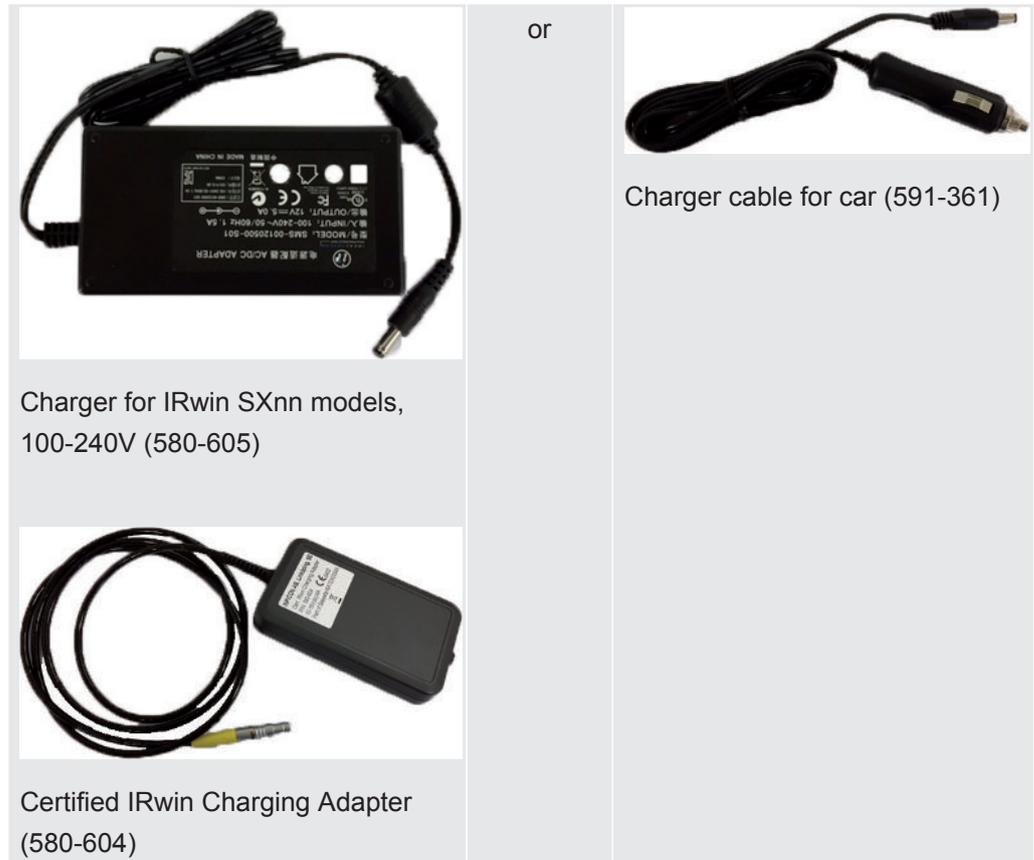


Table 14: Accessories for charging for IRwin SXnn and IRwin S from serial number 929000705

Charging IRwin SXnn and IRwin S from serial number 929000705

- 1 Switch off IRwin SXnn.
 - 2 Connect the "Certified IRwin Charging Adapter (580-604)" to the charging inlet of IRwin SXnn. Align the red markings of the charging socket and charging plug to each other.
 - 3 Connect the "Charger for IRwin SXnn models, 100-240V (580-605)" or "Charger cable for car (591-361)" to the "Certified IRwin Charging Adapter (580-604)".
- ⇒ The status LED is green when battery is charging normally. The status LED goes out when charging is completed.

Fast charging IRwin SXnn

- ▶ When the signal LED is green and indicating normal charge, press the upper right button.
- ⇒ The detector is now charging fast and the status LED turns cyan.

	Normal	Fast charge
100%	4 h from empty to full charge produces 9.5 h operation time	3 h from empty to full charge produces 9 h operation time
Short charge	1 h charging gives >3.25 h of operation	1 h charging gives 4 h of operation

4.2 Assembling the probe system

WARNING

Risk of explosion due to not approved probe parts.

The original INFICON Hand probe (part number 580-100) is the only part of the probe system that is certified for use in potentially explosive areas. Other parts of the probe system are not allowed in classified hazardous areas (Zone 0, 1, 2, Div 1 or 2).

- ▶ Pay proper attention to safety when using other accessories for locating and pinpointing gas leaks in none classified areas.



The assembly of the probe system influences the response time stated in the technical data.

The probe system is designed to cover the most commons tasks and includes for example the hand probe, the probe rod, the bar hole probe, the carpet probe and the bell probe. Each probe part is equipped with quick couplings and can be assembled according to the following graphics. The connection to the leak detector is made with the hand probe in all configurations.

The proper functioning of the system can only be assured with compatible probe systems of the manufacturer.

- 1 Attach the probe rod to the carpet or the bell probe.

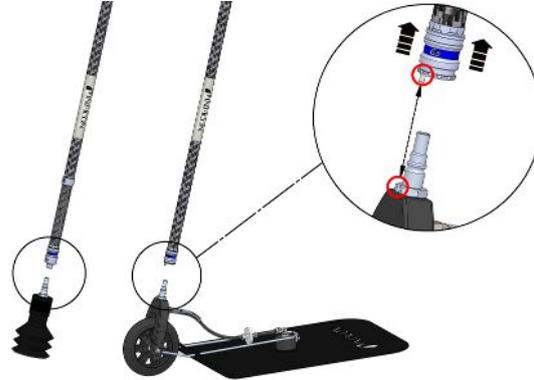


Fig. 10: Assembling the probe system 1

- 2 Attach the hand probe to the probe rod.

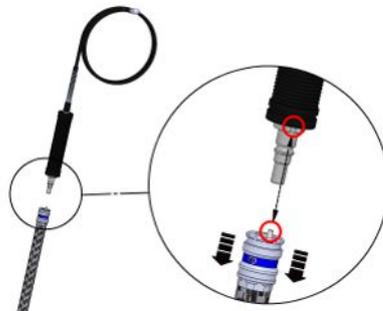


Fig. 11: Assembling the probe system 2

- 3 Connect the probe tube of hand probe to the gas inlet of the leak detector, see "Design of the leak detector [▶ 14]".

Install the probe rod extension

To improve the ergonomics of the carpet probe, you can install the "probe rod extension".

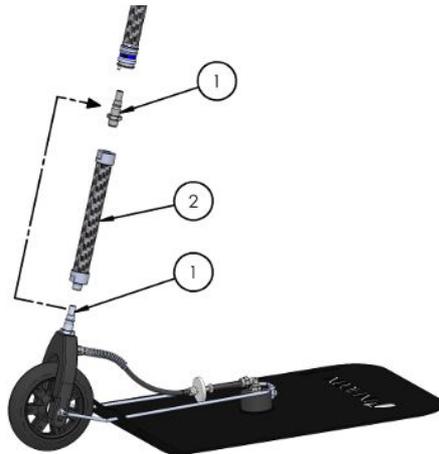


Fig. 12: Assembling the probe system 3

- 1 Remove the male quick fitting (1) from the carpet using as 17 mm wrench.
- 2 Remove the tape covering the female thread of the extension rod (2).
- 3 Place the O-ring, found under the tape, flat on the bottom surface of the female threaded hole.
- 4 Screw the removed male quick fitting (1) in place in the extension rod (2). Make sure the O-ring stays in place by holding the extension rod (2) vertical. If desired you can use nut locking fluid to secure the fitting (1).
- 5 Remove the O-ring and clean the threaded hole on the black fork on the carpet (where you removed the connector).
- 6 Place the O-ring flat on the bottom surface of the threaded hole.
- 7 Screw the extension rod in place in the carpet fork. Make sure the O-ring stays in place by holding the fork vertical.
IMPORTANT: Be careful when tightening. The fork is plastic and the threads are easily destroyed. If desired you can use nut locking fluid to secure the extension rod (2).
- 8 Connect the longer rod to the carpet.

5 Operation

WARNING

Danger to life and limb

Due to incorrect and irregular inspections.

- ▶ Check all parts of the entire measuring system regularly for damages.

5.1 Switch ON

WARNING

Explosion hazard

IRwin S and any kind of equipment for charging (for all models), are not ex-protected.

- ▶ Do not use IRwin S or any kind of charger for S and SXnn versions in explosive atmospheres.



The start-up sequence can differ slightly between the individual models.

- 1** Press the on / off button on the lower right of the display ("Design of the leak detector").
 - ⇒ During start-up, the leak detector passes through a warm-up phase of 2 minutes maximum and performs a self-test of software and parameter memories, battery, display, pumps, valve(s), buzzer, sensors and status LED.
- 2** To confirm the function of the buzzer, press the button next to check mark (upper right).
- 3** The status LED lights up in various colors as indicated on the screen. Confirm each color by pressing the check mark (upper right).
- 4** Confirm the results of the self test.
 - ⇒ The measurement screen appears.
- 5** If you want to check the condition of the leak detector even further, perform a calibration test ("Calibration (adjustment) [▶ 81]") or a function test ("Performing function tests [▶ 87]") before starting to work.

5.2 Quick Set-up

The first time you switch on the detector it will ask you to select language.

The language you choose will also adopt the functionality to suit the typical applications in your region. All parameters set in this way can be modified in the various settings menus. You can clear the entire Quick Set-up by pressing the two left buttons while the INFICON screen is displayed directly after power on. The Startup Settings screen will then appear again. Current language region setting is displayed in the About screen.

If skipping you will be asked for quick setup next time you turn on the detector.

Quick Set-up Matrix

Setting	Language / region				
	English (US)	English (UK)	Deutsch Nederlands Polski	Chinese	Italiano / Français
100% LEL	5.0 Vol%	5.0 Vol%	4.4 Vol%	5.0 Vol%	5.0 Vol%
Timezone (adjustable)	UTC -5 h	UTC +1 h	UTC +2 h	UTC +8 h	UTC +2 h
Universal / DVGW	Universal	Universal+	DVGW	Universal	Universal
CH4 content in ToxMix	2.5 Vol%	2.5 Vol%	2.2 Vol%	2.5 Vol%	2.5 Vol%
Low range Calibration	Generic, One point 2.5 Vol%	Generic, One point 2.5 Vol%	Classic, 10 ppm, 100 ppm, 2.2 Vol%	Generic, One point 2.5 Vol%	Generic, One point 2.5 Vol%
High range Calibration	2.5 Vol% 100 Vol%	2.5 Vol% 100 Vol%	2.2 Vol% 100 Vol%	2.5 Vol% 100 Vol%	2.5 Vol% 100 Vol%
Low range Function test	2.5 Vol%	2.5 Vol%	10 ppm	2.5 Vol%	10 ppm
High range Function test	100 Vol%	100 Vol%	100 Vol%	100 Vol%	100 Vol%
Time format	12-hour	12-hour	24-hour	24-hour	24-hour
Date format	MM/DD/YY	DDMMYYYY	DDMMYYYY	YYYYMMDD	DDMMYYYY
Start Mode	Universal	Universal+	Last used	Universal	Universal
PPM Adjustment Factor	1.2	1.2	1.4	1.2	1.4
Threshold PPM	10 ppm	100 ppm	10 ppm	50 ppm	10 ppm
Ethane concentration	3 Vol%	4 Vol%	2 Vol% DE 4 Vol% NL 1 Vol% PL	3 Vol%	2 Vol%

Table 15: Quick Set-up Matrix

5.2.1 Disabling audio alarms in non-Ex modes

The audio alarms in all modes except Ex and ExTox can be disabled. This can be handy if you work on a site where emission is the normal condition. Advanced user login required.

- 1  >  > General > Adv 3 (Tab)
- 2 Select Threshold Disable Non-Ex and press button next to .
- 3 Leave the view via .

5.2.2 Select available operating modes

Selecting Universal or Universal+ mode gives you one mode for the full range of gas concentrations from 1 ppm to 100 volume %.

The available operating modes are selected by the Quick setup if performed. The settings can be changed as follows.

- 1  >  > General > Adv 2 (Tab)
- 2 Select Universal, Universal+ or DVGW from the Available modes drop down menu and press check mark .
- 3 Leave the view via .

5.2.3 Adjust the local time

The time zone and time format is automatically set by the Quick setup if performed.

If the time of the leak detector and the local time do not match you can change the time zone.

- 1  >  > General > Time/Date (Tab).
- 2 Adjust the local time zone.
⇒ For the settings, see "Factory settings [▶ 32]".
- 3 Leave the view via .

5.2.4 Setting the language

The language selected by the Quick setup if performed. The setting can be changed as follows.

- 1  >  > General > Misc (Tab) > Language
- 2 Select a language.
- 3 Leave the view via .

5.2.5 Activating Audio Locating Signal

IRwin can do set to give an audio signal to facilitate locating leaks. This particularly handy when using the Hand Probe to locate leaks on exposed pipes or equipment. The pitch / frequency of the signal increase as the gas concentration increases. The audio signal has an autorange function meaning it will drop and start to rise again when passing 100 ppm, 1000 ppm, 1% and 2.7%.

Activating Audio Locating Mode has three options: OFF, ON (active in Universal, Plants and GC Analysis modes) and GC (active in GC Analysis mode only).

- 1  >  > General > Adv 3 (Tab).
- 2 Select Activate Audio Locating Signal and select desired option.
- 3 Leave the view via .

5.2.6 Bluetooth Pairing Code required

- 1  >  > General > Adv 3 (Tab).
- 2 Select Bluetooth Pairing Code Required and press for enabling and for disabling.
- 3 Leave the view via .

5.2.7 Change permission level

The leak detector has three permission levels “Basic“, “Intermediate“ and “Advanced“. The leak detector starts with the permission level "Basic". The permission levels “Intermediate“ and “Advanced“ are protected by a password. The passwords for Intermediate and Advanced permission levels can be changed as described below. You can see which permission level is active in the status line of the display ("Display [▶ 18]").

Symbol	Permission level	Default password
	Basic	none
	Intermediate	1111
	Advanced (Supervisor)	1422

Table 16: Permission levels

Change permission level

- 1  >  > Password > Login (Tab).
- 2 Use the navigation buttons to enter the password for the desired permission level.
- 3 Leave the view via .

Change Passwords

- 1  >  > Password > Login (Tab). enter Advanced password
- 2 Navigate to Adv (Tab) and press check mark
- 3 Navigate to Set for the Password to be changed and press check mark.

4 Enter the new password and press check mark.

5 Leave the view via .

Reset Password

Follow steps 1 and 2 in instruction for setting password and select reset.

The current passwords are displayed at the bottom of the screen if you are logged in on level Advanced.

Block on failed FT

When logged in as Advanced you can set IRwin to lock if a function test fails. If this function is activated, the measurement modes will be blocked if a function test fails. This block will be released if a new function test passes successfully.

The block can be temporarily ignored by logging in as Intermediate or Advanced user.

Follow steps 1 and 2 in instruction for setting password and tick the box to activate Block on failed FT.

Log out from a higher permission level

If you want to restore the permission for "Basic", you must log off.

1  >  > Password > Logout (Tab).

2 Press the check mark button two times to log out.

5.2.8 PPM Adjustment Factor

The PPM Adjustment Factor can be used to slightly overestimate low natural gas concentrations. This can be handy if bump test requirements require an indication of at least 10 ppm instead of the specified tolerance of +5/-2 ppm.

The selected value (1.0 to 2.0) will be multiplied with the calibrated reading.

Setting this factor to e.g., 1.4 will make IRwin display a 10 ppm reading as $1.4 \times 10 = 14$ ppm.

This adjustment affects values up to 10 ppm and turns into a minor offset above 10 ppm.

▶  >  > General > Adv 1 (Tab).

5.2.9 Select Gas (Ex)

If desired you can set IRwin to measure Propane (C_3H_8) or Butane (C_4H_{10}) instead of methane (CH_4).

IRwin will use your methane calibration and built-in correction data for the selected gas.

▶  >  > General > Adv 1 (Tab).

5.2.10 100% CH₄ LEL conc

The LEL concentration is automatically set by the Quick setup if performed.

If not matching your requirement you can change the LEL level according to local standards. Choose between 4.4% and 5.0%.

▶  >  > General > Adv 2 (Tab)

5.2.11 Set limits and alarm levels

WARNING

Explosion hazard

Irwin S is not certified for use in explosive atmospheres and is also not suitable for estimating fire potential (LEL level).

Alarm indications:

Gas alarms are usually separated into three levels of severity:

Priority	Alarm	Display and status LED	Acoustic signal
Low	AL1	Red, flashing (2 Hz)	2 Hz
Medium	AL2	Red, flashing (3 Hz)	3 Hz
High	AL3	Red, steady on	Steady on

Table 17: Set limits and alarm levels

The detector will beep and the status LED and the display will be red if the measured gas concentration exceeds a set alarm level (below threshold for O₂ alarms AL1 and AL2).

Faster flashing or beeping will indicate more severe conditions. See table above.

The oxygen alarm differs from the other in that the main risk (asphyxiation) is associated with low oxygen. The alarms AL1 and AL2 for oxygen warns when the oxygen concentration goes below the respective alarm level. AL3 for oxygen is activated when oxygen concentration exceeds AL3.

The % unit in the settings menu means % of LEL for Ex and Ex Tox operation modes and volume % for all other modes. In the operating modes "Universal", "Above Ground", "Plants" and "House" you can also set a PPM level alarm to help when surveying for leaks.

The acoustic signal and the status LED are the primary alarm signals of the operating modes "Ex" and "Ex Tox".

- All alarms are latching and must be confirmed manually even if the alarm conditions that lead to the alarm are no longer existing. Alarms are confirmed by pressing the upper right key, next to the check mark.
The alarm will come on again if the alarm condition is still valid.
- You can temporarily mute the alarm by pressing the lower left key (M). The muting will turn off automatically after 15 minutes.
You can unmute the alarm manually by pressing the lower left key again.
- Muting will also turn off if a higher alarm is triggered.

Setting alarm thresholds

- ✓  Login as Intermediate or Advanced
- 1  >  > Thresholds
- 2 Select desired tab:
 - ⇒ CxHy (gas survey and LEL alarms)
 - ⇒ Safety (toxic and oxygen alarms)
 - ⇒ xTEL (toxic exposure limits)
- 3 Set the desired thresholds.
- 4 Leave the view via .



When you press the lower left key you mute the acoustic alarm . You can unmute the alarm manually by pressing the same button again. The alarm will be unmuted automatically after 15 minutes.

5.2.12 Select Available Modes

IRwin can be configured in three main modes: DVGW, Universal and Universal+. DVGW mode is adapted to German, Dutch and Polish work procedures with specific test modes for different applications.

Universal and Universal+ modes combines most of the different modes of the DVGW mode into one single, full range, auto-ranging mode.

GC Ethane Analysis, Ex and ExTox modes are, however still separate. Universal+ mode is similar to Universal mode but the main measuring display is adapted to the UK EM72 work procedure.

The selection of one of these modes is automatically set by the Quick setup first time you start IRwin, see "Quick Set-up [▶ 44]".

To manually select between the available modes:

- ▶  >  > General > Adv 2 (Tab)

5.2.13 Universal Cal Setup / AbG Cal Setup

Calibration setup for Universal and Above Ground modes is used to customize the calibration routing for low concentration methane measurements. The Classic setting uses the calibration routine specified by German and Dutch work procedures whereas the Generic option makes it possible to use only one or two gas concentrations instead of three.

Note that reducing the number of gas concentrations may result in lower accuracy not fulfilling the entire specification.

- ▶  >  > General > Adv 2 (Tab)

Selection of gas concentrations to use is made by changing the Setting of calibration gas concentration. See "Calibration (adjustment) [▶ 81]" and "Setting of calibration gas concentrations [▶ 85]".

5.2.14 Universal Fnc Test conc / AbG Fnc Test conc

The above ground function test concentration is selected by the Quick setup if performed. The settings can be changed as follows.

The gas concentration used for Universal and Above Ground Function Test can be set to suit your application. You can choose between 10 ppm, 500 ppm and 2.2 or 2.5 Vol% (representing 50% LEL as set).

▶  >  > General > Adv 2 (Tab)

5.2.15 Set the brightness of the display

- 1  >  > General > Display (Tab) > Brightness
- 2 Select a value for the brightness.
- 3 Leave the view via .

5.2.16 Screensaver timeout

You can activate a screen saver that will turn the screen off if there is no alarm or key action within an adjustable time.

- 1  >  > General > Display (Tab)
- 2 Select the desired timeout or select "Off" to disable the screensaver.
- 3 Leave the view via .

Switch on screen

- ▶ To switch the screen back on, press any button. It will switch on automatically if a gas alarm is triggered.

5.2.17 Auto-Rotate Screen

When you set the auto-rotate screen the display will flip automatically as soon as you turn the leak detector upside down.

- 1  >  > General > Display (Tab) > Auto-rotate screen
 - ⇒ The symbols (top right) and (bottom right) appear.
- 2 Select auto-rotate screen press button next to crossed box .
 - ⇒ To switch off the auto-rotate screen, press button next to empty box .

5.2.18 Configure data logging

You can record and store your survey with following data in the leak detector.

- Date

- Time
- GPS coordinates

Measurement data of the activated mode:

- CH₄ and CO₂ measurements
- % LEL
- CO, O₂ and H₂S measurements (IRwin SXT and IRwin SXGT)

The measurement data recording must be configured before the initial use:

✓   Login as Intermediate or Advanced

- 1  >  > Data output > Log to File (Tab)
- 2 Select "Enable log to file" and press the button next to .
- 3 Select "Log interval" and select a time interval. A blue button is shown in the lower right corner when data logging is enabled. Press the on / off button to start and stop logging to file.



The shorter you set the recording interval the more disk space is required. The percentage of disk space used is shown by the bar below, "Used disk space" on the Log to File tab.

5.2.19 Enable dead band suppression (IRwin SXnn only)

For the toxic sensors in the application mode "Ex Tox mode" a dead band suppression can be activated. If you activate the dead band suppression, the leak detector will suppress small signal fluctuations around the zero point of the measurement signal.

- 1  >  > General > Misc (Tab) > dead band Suppression.
⇒ The symbols (top right) and (bottom right) appear.
- 2 Press the button next to .

5.2.20 Setting the Function Test Interval

Setting time interval for Function Test Reminder

Consider relevant standards and regulations.

✓   Login as Intermediate or Advanced

- 1  >  > Function Test > Interval (Tab)
- 2 Select the function test and the time interval.
⇒ IRwin S: You can set a time interval.
⇒ IRwin SXnn: You can set the time interval individually for the modes "Above Ground" / "Universal (low range)", "Bar Hole" / "Universal (high range)", "Ex", "Tox Mix" and "GC".
- 3 Leave the view via .

5.2.21 Transfer data to computer



System requirements: Windows 10 or later with Bluetooth interface.

5.2.21.1 IRwin Check-in

IRwin Check-in

IRwin Check-in connects IRwin to your smartphone or tablet via Bluetooth® and has the following main functions:

- Transfer log and report files from IRwin to storage a location of your choice like a cloud server.
- Acting as IRwin user interface allowing you to carry IRwin out of sight.
- Buzzer signal can be transferred to your Bluetooth® earpiece.

IRwin Check-in work on IRwin units delivered from Q4 2023 and is vailable for Android from Google Play and for iOS from App Store.

5.2.21.2 IRwin Viewer

IRwin Viewer is a Windows application handling data from IRwin. Main functions are:

- Download log files directly from IRwin.
- Delete files on IRwin.
- Upload log and report files previously sent from IRwin to your server etc.
- Open IRwin files for inspection.
- Generate reports from IRwin files such as:
 - Survey reports with map showing position and magnitude of recorded signals.
Can be commented.
 - GC analysis reports
 - Function Test reports
- Live stream IRwin values to computer.

IRwin Viewer is available for download on IRwin product page on inficon.com.

5.2.21.3 Paring IRwin with computer via Bluetooth

- ✓ Start IRwin and let it pass the self-test.
- ✓ Check that the Bluetooth symbol appears in the status field on IRwin display.
- ▶ Bluetooth activated
 - 1 Type "Bluetooth" in serch field on your Windows computer and select Bluetooth & other devices settings".
 - 2 Check that Bluetooth is On close to top of the settings window.
 - 3 Click the plus sign to Add Bluetooth or other devices.
 - 4 Select Bluetooth in the pop-up window.
 - 5 Look for the serial number of your IRwin detector.
 - 6 When appearing clock on the serial number.
 - 7 Check that the pin code displayed on IRwin matches that displayed on the computer. Confirm on both units.
 - 8 Wait until the computer shows that your IRwin is "Paired".
 - 9 Click Done and close the settings window.

You are now set to use IRwin Wiever to transfer files and strea data from IRwin.

5.3 Operating modes



After 2 minutes of inactivity the menu system exits automatically to the measurement screen.

5.3.1 Select operating mode

After finishing the self test the leak detector goes into the operating mode.

- ▶ Press  repeatedly to scroll through the operating modes.

The detector is ready to use when the measurement value(s) turn(s) black and the status LED illuminates blue (green for Ex and Ex Tox modes).

5.3.2 Operating mode "Above Ground"

This mode is the most sensitive and intended for pipeline survey. This is done by taking samples on the ground surface along the pipe route typically using the carpet probe.

The detector is ready to use when the measurement value(s) turn(s) black and the status LED illuminates blue (green for Ex and Ex Tox modes).

 **WARNING**

Do not use Above Ground, Universal or Universal+ modes for safety check.

The accuracy is not certified for LEL measurement.

- ▶ Observe all safety precautions when alarms are given.
- ▶ Never open or enter a confined space without first testing LEL level in the Ex or ExTox mode.

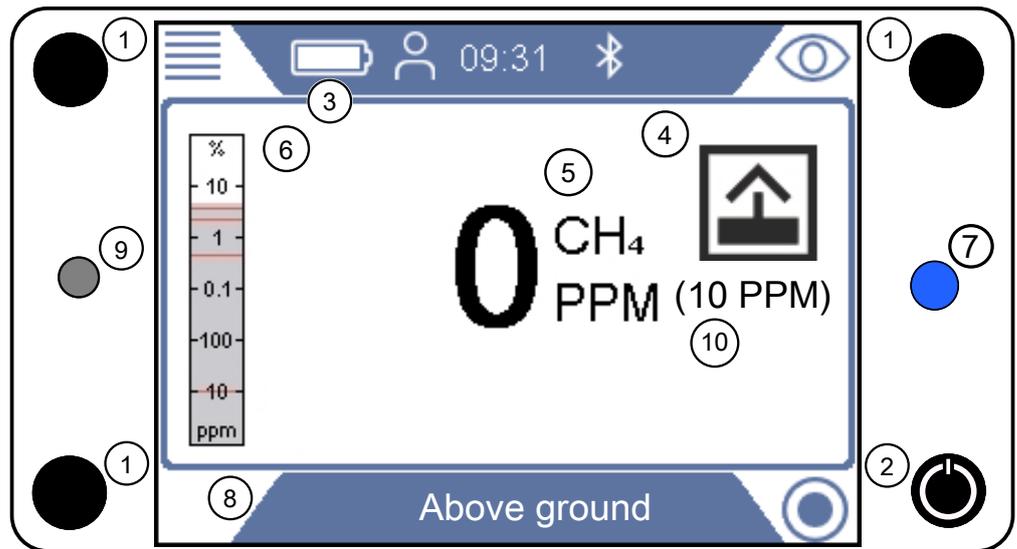


Fig. 13: "Above Ground" display

1	Navigation buttons	2	Navigation and on / off button
3	Battery status indicator	4	Mode icon
5	Measured value, target gas and unit	6	Analog bar indicating range (grey), measurement value (blue) and alarm settings (red lines) in quasi-logarithmic scale
7	Status indicator LED	8	Operation mode and menu bar
9	Buzzer	10	PPM threshold in Above Ground and Confined Space modes.

Measurement range

Measurement range	1 ppm - 5 Vol% methane
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5.3.3 Operating modes Universal and Universal+

These modes combine highest sensitivity for PPM levels of Methane all the way up to 100 Vol% and can be used for all applications except safety checks. The Universal+ mode is further adopted to the UK EM72 operating procedures.

Use Ex or ExTox mode for checking the safety of the work place.

WARNING

The LEL values displayed in the Universal and Universal+ modes are calculated from the gas level measured in the non-certified Universal mode.

This value is not compliant with or certified to IEC 60079-29-1 and must not be used for safety clearance.

WARNING

The O2 concentration displayed in the Universal+ mode is a displacement calculation based on the measured natural gas concentration.

This value is not compliant with or certified to EN50104 and must not be used for safety clearance.

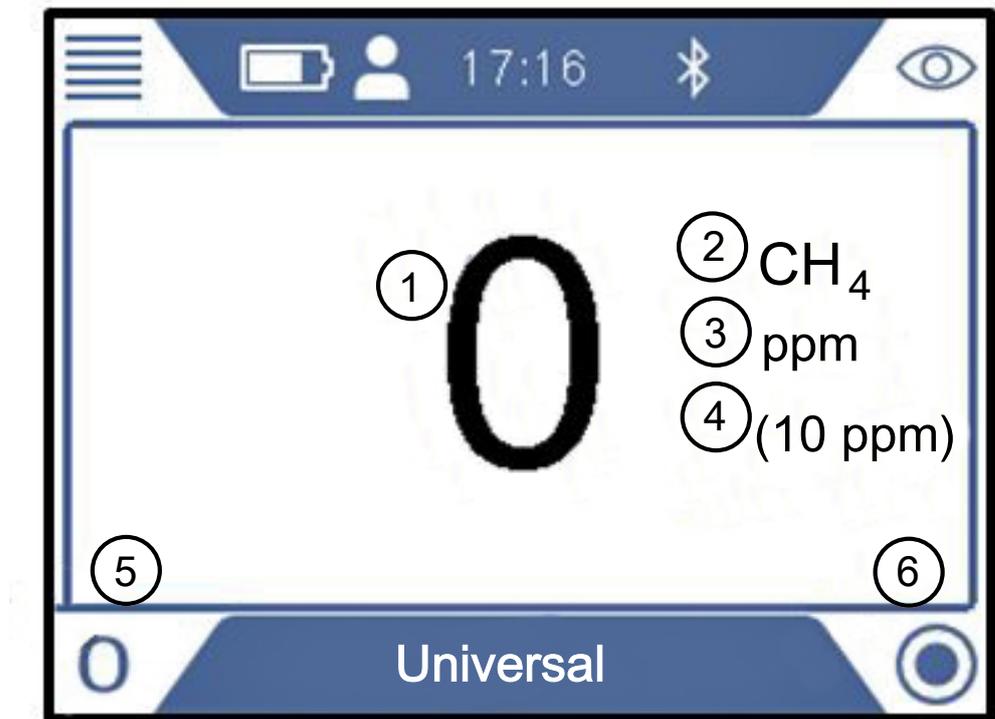


Fig. 14: "Universal" display

1	Measurement value	2	Measured gas
3	Unit of measured value	4	PPM threshold
5	Zeroing button, if needed. Zeroing symbol disappears if gas is detected.	6	Data logging activation.

Measurement range	Measurement range	1 ppm - 100 Vol% methane
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Universal+

The Universal+ mode can be activated as followed

- 1 > > General > Adv 2 (Tab)
- 2
- 3 Select Universal Mode and press check mark
- 4 Scroll to Universal+ and press check mark
- 5 Exit by pressing several times

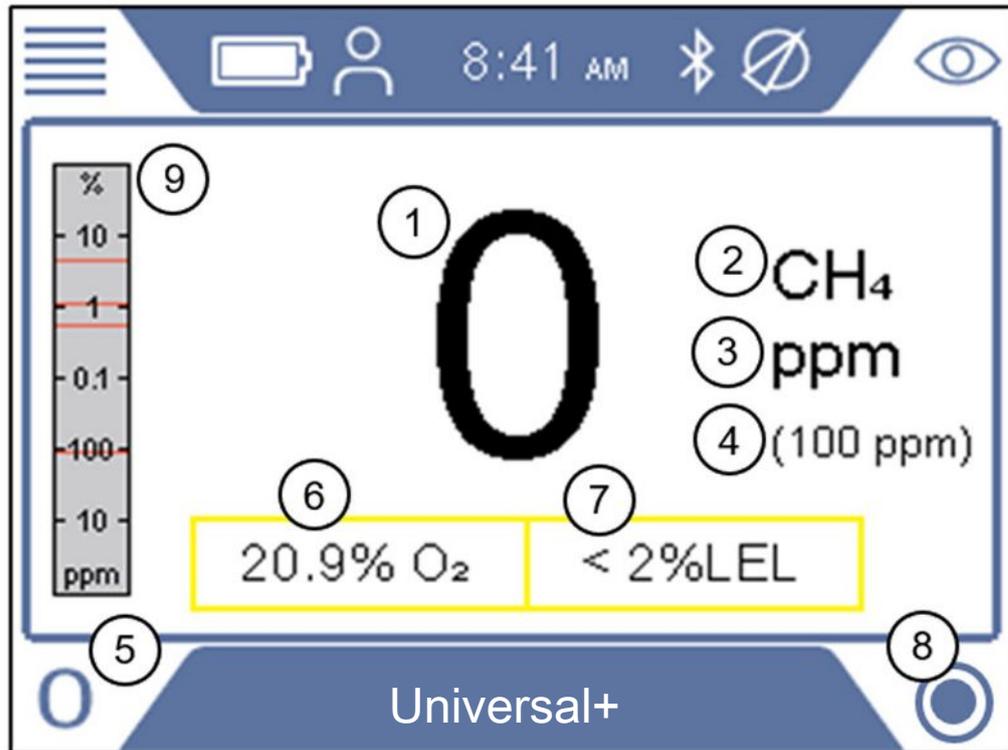


Fig. 15: Universal + Display

1	Measurement value	2	Measured gas
3	Unit of measured value	4	PPM threshold
5	Zeroing button. Zeroing symbol is deactivated if gas is detected	6	Calculated oxygen concentration. Only on SXT and SXGT models. Not for safety clearance!
7	Gas level in %LEL Not for safety clearance!	8	Data logging activation
9	Analog bar indicating gas range (grey), measurement value (blue) and alarm settings (red lines) for CH ₄ (or C ₃ H ₈ or C ₄ H ₁₀ as selected in settings). Alarms settings shown are ppm, C _n y AL1, AL2 and AL3.		

Note: The Oxygen and LEL signals presented in the **Universal+** mode are not certified and must not be used for safety clearance, see “Certified Gas Measurement [▶ 10]”.

5.3.4 Operating mode “Bar Hole”

This mode is intended for pin-pointing leaks by measuring the concentration in the ground. The detector is ready to use when the measurement value is black and status LED is blue. No gas alarms are given in this mode.

⚠ WARNING

No gas alarms are given in the Bar Hole mode.

When pin-pointing leaks you will often encounter very high concentrations, far above the LEL limit.

► Be careful and follow all relevant safety regulations.

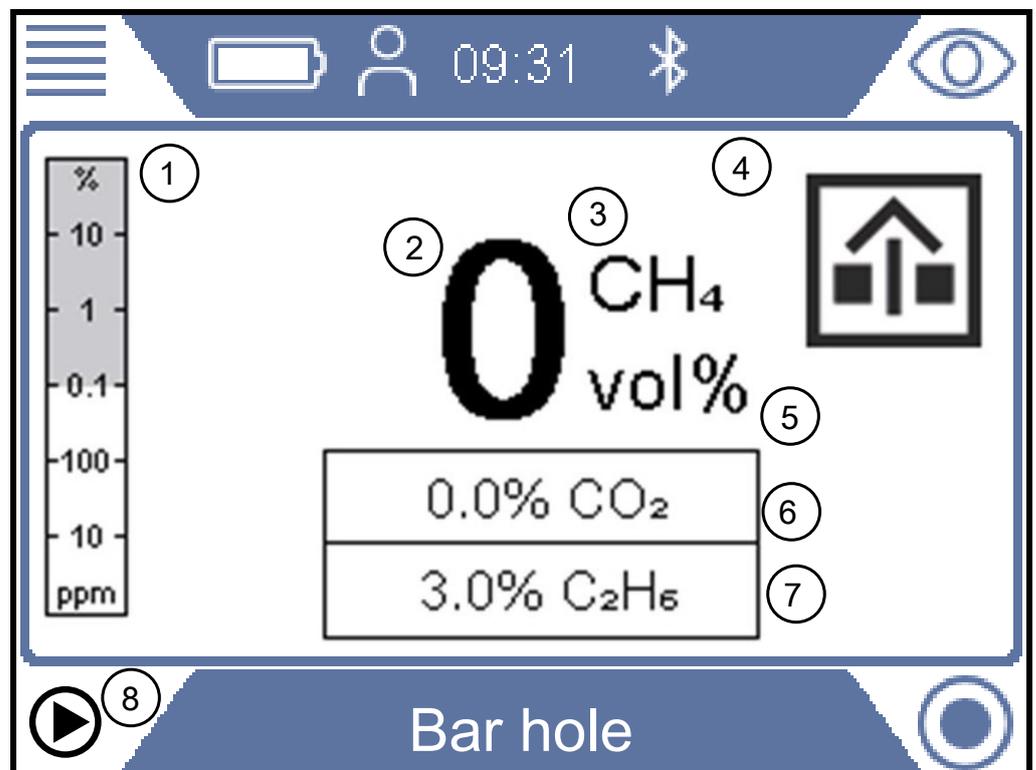


Fig. 16: "Bar hole" display

1	Analog bar showing range (grey) and measurement value (blue) in Vol% (quasi logarithmic scale)	2	Measurement value
3	Measured gas	4	Symbol of active operating mode
5	Unit of the measured value	6	CO ₂ measurement value
7	C ₂ H ₆ compensation value	8	Start Automatic Bar hole test. Zeroing button, if needed. Zeroing symbol disappears if gas is detected.

Measurement range

Measurement range	0.1 Vol% - 100 Vol% CH ₄
	0.1 Vol% - 20 Vol% CO ₂

You can readjust the zero point of the CH₄ Vol% value if needed. Press lower left button if "0" appears in blue.

**NOTICE****Measurement errors due to incorrect ethane compensation**

Incorrect ethane compensation value can result in significant deviations in the estimated methane concentration.

See "Entering ethane concentration manually [▶ 78]" for information on how you set the value for ethane compensation. See also "Setting reminder for IR Ethane Analysis [▶ 78]".

5.3.4.1 Automatic "Bar Hole" testing

The detector has an automated function for ventilating and testing the gas content in bar holes. This function will take three samples in the hole with a pre-determined evacuation time between the samples. Default setting is 10 s measurement and 3 minutes evacuation between samples. You can also set the detector to terminate the sequence when the CO₂ level has dropped below a given threshold even if all three samples are not yet taken (Setting parameters for "Auto Bar Hole").

A low content of CO₂ is a good marker for a well ventilated hole.

The leak detector starts beeping when the test sequence is finished and displays the methane and CO₂ concentrations.

1. Set the leak detector in Bar Hole mode.
2. Press the lower left key  to start Auto Bar Hole test.
3. Place the probe in or on the hole and press the check mark key.
4. Leave the leak detector to complete the Auto bar Hole test.
5. You can read the result of the individual measurements on the display when the sequence is ready. The leak detector will start beeping when the test is ready. Note that three results will be presented even if IRwin did not make all three. The results are cleared when you press the check mark key.

5.3.4.2 Setting parameters for “Auto Bar Hole”

- 1  >  > Auto Bar Hole > Settings (Tab)
- 2 Measuring Duration. This is the time the detector tests the gas in each measurement. Select 10 - 20 s (5 s increments)
- 3 Evacuation Duration. This is the pumping/evacuation time between measurements. Select 3, 4, 5, 10 or 15 min.
- 4 CO₂ Limit on Evacuation. This is the limit indicating a well evacuated test point. Auto Bar Hole sequence will be terminated directly after completing one measurement in which CO₂ level has dropped below the set limit. Select Off to disable function or 1 - 5% to activate function.

5.3.5 Operating mode "GC Ethane Analysis"

This mode is intended for determining if a gas sample is natural gas (NG) or liquefied petroleum gas (LPG), by identifying the methane, ethane and propane content.

Natural gas (NG) typically contain at least 0.5 vol% of ethane in addition to a high concentration of methane.

Liquefied petroleum gas (LPG) typically contain propane or butane or a mixture of the two.

These differences are the basis for identifying gas type from an hydrocarbon analysis.

While significant ethane content (>0.5 Vol%) in a methane rich mixture is a certain indication of natural gas, it is not entirely safe to say that no indication of ethane in a methane rich mixture is a certain indication of swamp gas.

Some natural gas contains no or only traces of ethane.

This can be due to several reasons, for example:

- The gas source is solely or partly liquefied natural gas (LNG) which sometime has very low ethane content.
- The gas source is solely or partly biogas.
- The natural gas source has very low ethane content.

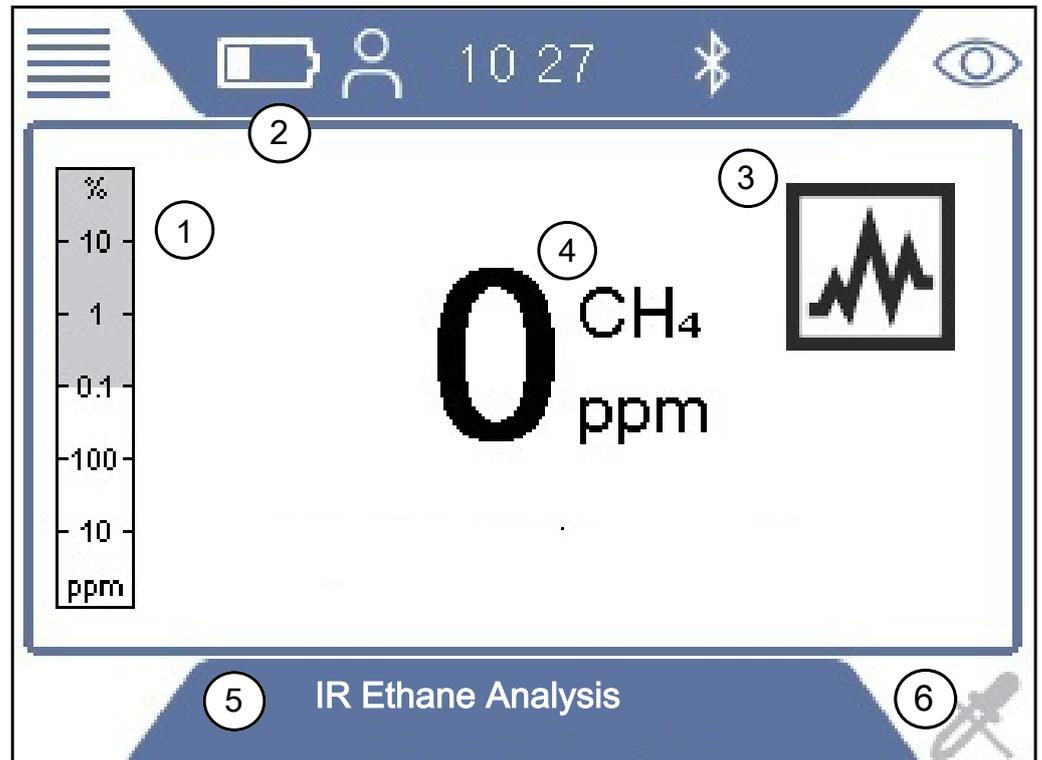


Fig. 17: "GC Ethane Analysis" display

1	Analog bar indicating concentration range (grey) needed to perform GC Ethane Analysis and measurement value (blue) in quasi logarithmic scale	2	Battery status indicator
3	Mode icon	4	Measured value, target gas and unit
5	Operation mode and menu bar	6	Take sample for analysis. Becomes active (blue) and cross disappears when natural gas concentration is high enough.

Measurement range

Detectable range	≥ 0.5 Vol% ethane in gas.
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The following procedure is highly recommended on site to strengthen the evidence that a gas sample is indeed natural gas:

- Check that ambient temperature is within range for GC Ethane Analysis: 0 – 50°C (32-122°F)
- Perform a GC Ethane Analysis Function test to check that the GC Ethane Analysis can detect ethane down to 0.5 Vol% in the gas sample. Gas used see Concentration of calibration and test gases [▶ 35]
- Make a GC Ethane Analysis on a sample of natural gas from the actual gas line at your site.

- Make a GC Ethane Analysis on the gas to be identified and compare the resulting curve to that obtained from the natural gas sample. Three consecutive tests with same result should serve as a clear result.
- If any doubt on this result remains perform a final function test to assure that the unit was working properly during testing.

If the ethane content in the natural gas is below 0.5 Vol% the GC Ethane Analysis cannot be used. The GC must also give a clear indication of ethane to serve as an indicator of natural gas. A clear indication is a ticked ethane box on the screen.

IRwin GC is sensitive enough to detect 0.5 % ethane in methane.

The operator is fully responsible for evaluating the logic and likelihood of the correctness of the result being presented by IRwin, based on the ethane content in the tested gas, the maintenance and functionality of IRwin Methane Leak Detector and other circumstances related to the issue.



Overloading the GC column with high gas concentrations will make analysis slow and possible non-functional

Move instrument away from leak area to fresh air directly after taking sample to avoid this. If you suspect overloading, you can make a prolonged column purge by pressing the lower left button more than 3s.

Purging will continue for 30 minutes or until manually terminated or until instrument shuts down.

- 1** When in IR Ethane Analysis mode, expose to gas.
- 2** Press lower left button when cross disappears and sampler symbol turns blue.
 - ⇒ The detector prompts you to remove probe system and expose to fresh air.
- 3** Confirm that you have removed the probe system and have the instrument in fresh air.
 - ⇒ The sensor system is purged to prepare for GC Ethane Analysis.
 - ⇒ GC analysis starts and the resulting graph is being displayed. Remaining time is displayed.
- 4** If the sampled gas is identified as Natural Gas or Methane Gas you will be given the option of ending the GC analysis before the graph is completed. Propane is not analyzed if ending.
 - ⇒ Result is interpreted and displayed (see A and D below).
 - ⇒ The GC system is purged. Remaining purge time is displayed (see B below).
- 5** Press lower right to zoom graph (see C below).
- 6** Press lower left button to save analysis (see E below).
- 7** You can postpone purging of GC system by leaving the GC result screen before the purge is completed.

⇒ Purging will restart automatically if shutting IRwin down or attempting to make a new GC Ethane Analysis.



Irregular GC Ethane Analysis results can in some cases occur due to the flammable gas sensor being overloaded. This could for example, happen if the detector is in high gas background during analysis or purge. The following steps will normally fix this:

Initiate an extended column and sensor purge by holding the lower left key for >3s before leaving the GC graph.

Perform a GC calibration (requires Advanced user login).

Perform GC function test directly after the GC calibration.

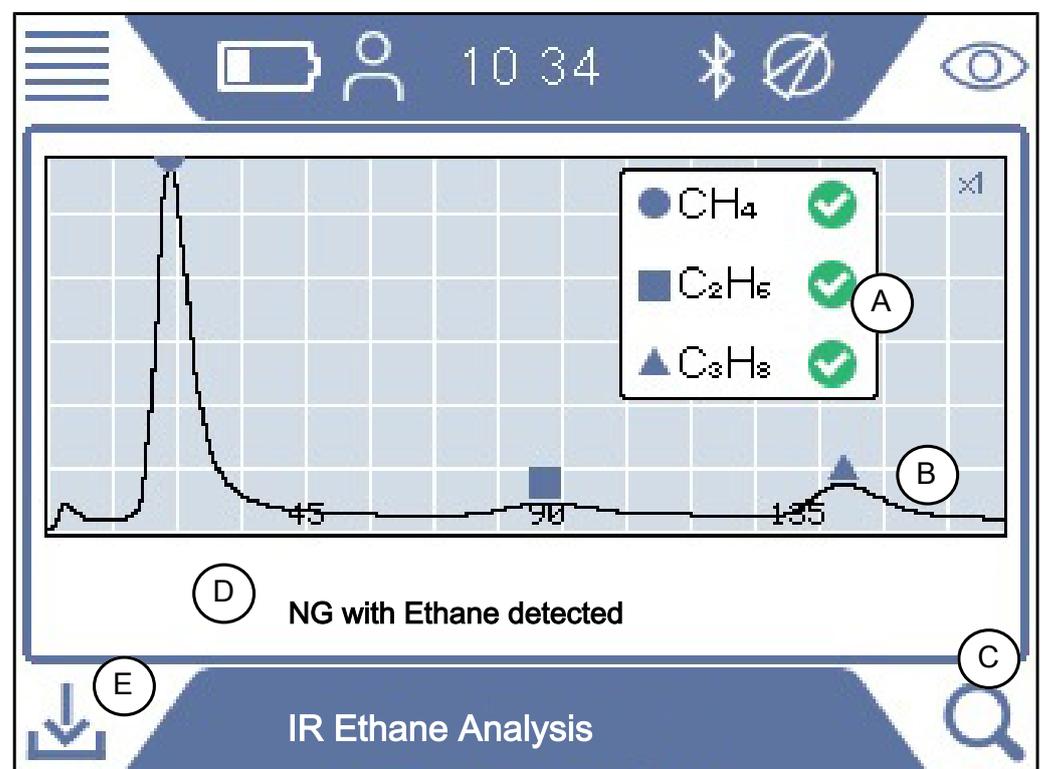


Fig. 18: NG with Ethane detected

The data saved after a IR Ethane Analysis contains data for when and where the sample was taken.

The data can be retrieved by IRwin APP (Windows application) that will create a PDF report for the analysis.

You can save a large number of analysis data files for later report generation.



Avoid transferring files while a GC analysis is running as this can severely affect the result.

5.3.6 Operating mode "Plants"

 WARNING

The accuracy of the methane measurement in the operating modes "Plants" and "House" is not certified for the LEL measurement.

Observe all safety precautions when alarms are given. Never open or enter a room without first checking the LEL level in Ex or Ex Tox operation mode.

The operating mode House is not intended for pre-entry safety checks. The fire potential can only be determined in one of the Ex or Ex Tox operating modes.



NOTICE

The reference inlet of the leak detector must be in fresh air.

Only probe inlet should be in the confined space.

This mode is used for checking the gas concentration in confined spaces such as man holes, duct openings, etc. The leak detector is ready to use when measurement value is black and the status LED is blue.

This mode is not available if Universal mode is activated.

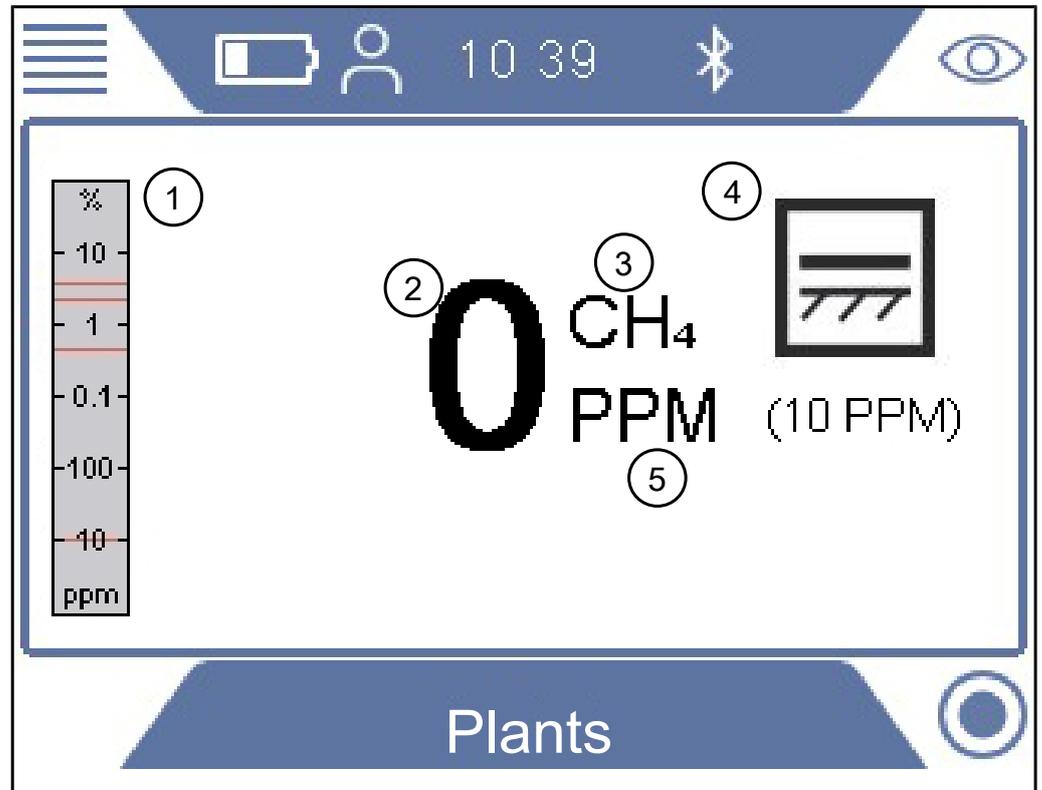


Fig. 19: "Plants" display

1	Analog bar indicating range (grey), measurement value (blue) and alarm settings (red lines) in VOL% (quasi-logarithmic scale)	2	Measurement value
3	Measured gas	4	Symbol of active operating mode
5	Unit of the measured value		

Measurement range

Measurement range	1 ppm - 5 Vol% methane
-------------------	------------------------

5.3.7 Operating mode "House"

⚠ WARNING

Gas alarms are not safe in this mode!

The background concentration around the detector is zeroed out. Signal will only be displayed if probe detects higher gas than the reference inlet.

The accuracy of the methane measurement in the operating modes "Confined Space" and "House" is not certified for the LEL measurement.

► Observe all safety precautions when alarms are given.

This operating mode is used to check installations and pinpoint leaks in buildings. The detector is ready to use when the measurement value is black and status LED is blue.

This mode is not available if Universal mode is activated.

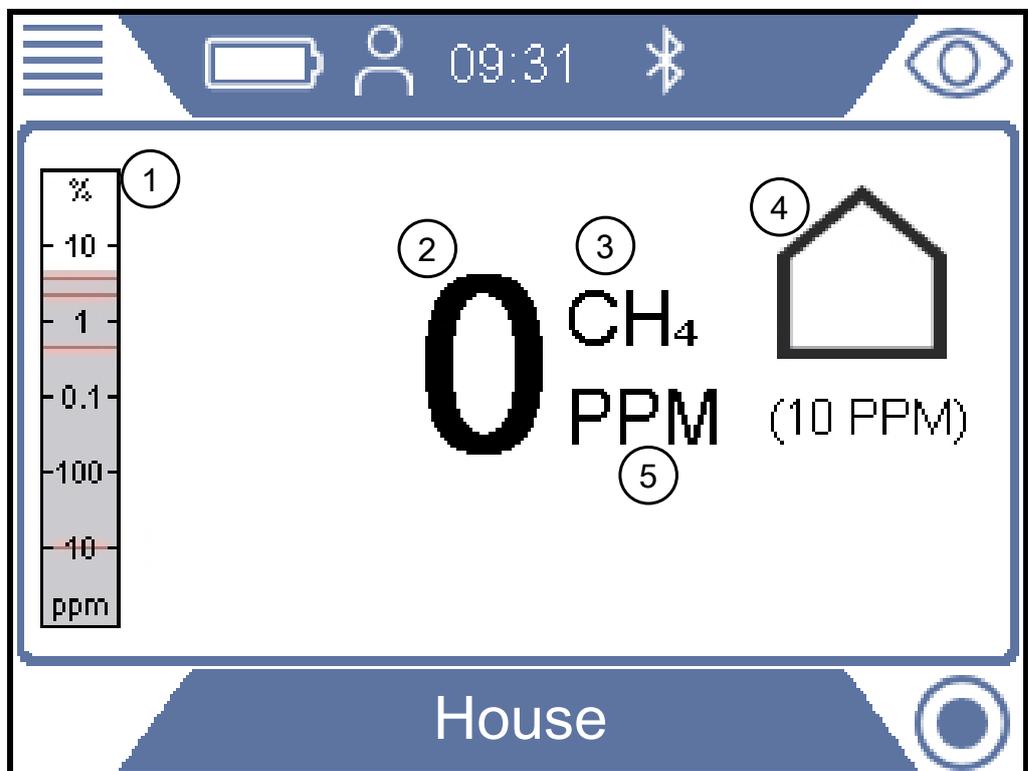


Fig. 20: "House" display

1	Analog bar indicating range (grey), measurement value (blue) and alarm settings (red lines) in VOL% (quasi-logarithmic scale)	2	Measurement value
3	Measured gas	4	Symbol of active operating mode
5	Unit of the measured value		

Measurement range

Measurement range	1 ppm - 100 Vol% methane
-------------------	--------------------------

5.3.8 Operating mode "Gas Purity"

This mode is intended for checking that the gas has reached a certain point in the network when a previously purged section is refilled.

This mode is not available if Universal mode is activated.

⚠ WARNING

No gas alarms are given in this operation mode!

This operating mode is intended for the measurement of higher gas concentrations. In this mode you usually see up to 100 Vol% methane.

► Follow all relevant safety precautions and regulations.

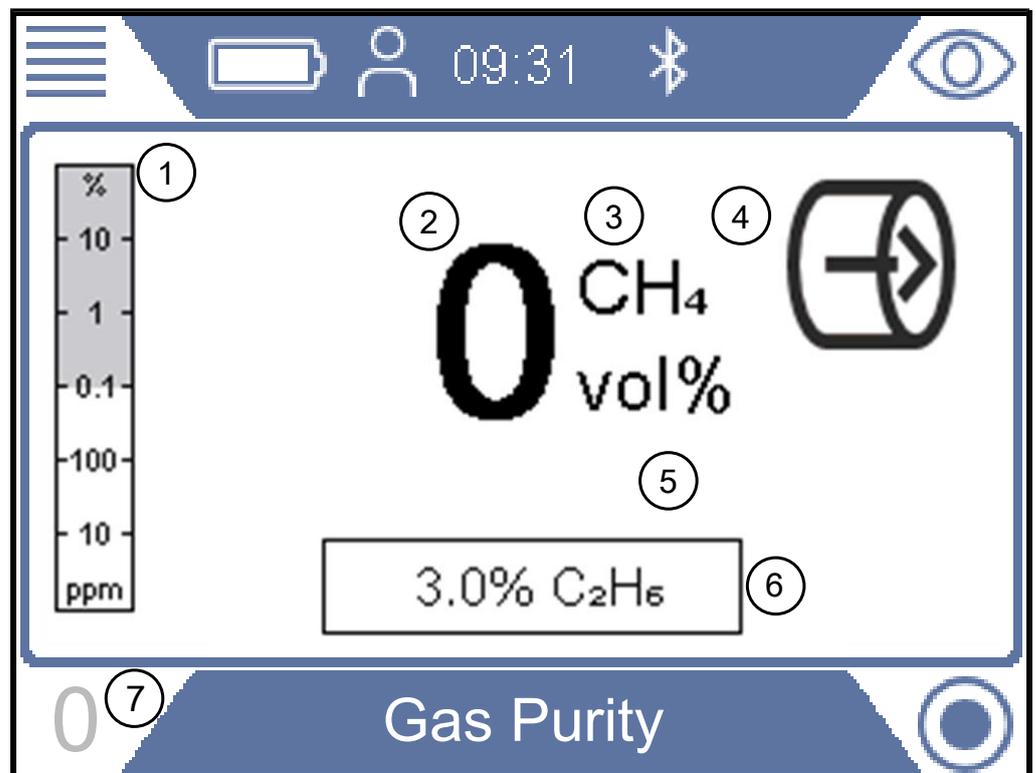


Fig. 21: "Gas Purity" display

1	Analog bar indicating range (grey) and measurement value (blue) in Vol% (quasi logarithmic scale)	2	Measurement value
3	Measured gas	4	Symbol of active operating mode
5	Unit of the measured value	6	C ₂ H ₆ compensation value
7	Zeroing button, if needed. Zeroing symbol disappears if gas is detected.		

Measurement range

Measurement range

0.1 - 100 Vol% methane

You can readjust the zero point of the CH₄ Vol% value if needed. Press lower left button if "0" appears in blue.

5.3.9 Operating mode "Ex"

This operating mode is used to check or monitor the fire or explosion risk in the working environment. The concentration of the gas is given in % LEL. A signal of 100% LEL or higher (> % LEL) means there is a risk of fire.

This mode is not available if Universal mode is activated.

⚠ WARNING

Explosion risk

The concentration can be much higher at another point close by.

- ▶ Be aware that the displayed concentration represents the concentration at the gas inlet point of the probe.

The leak detector is ready to use when the measurement value is black and the status LED is green and the acoustic alive signal beeps every 20 seconds. See warning text.

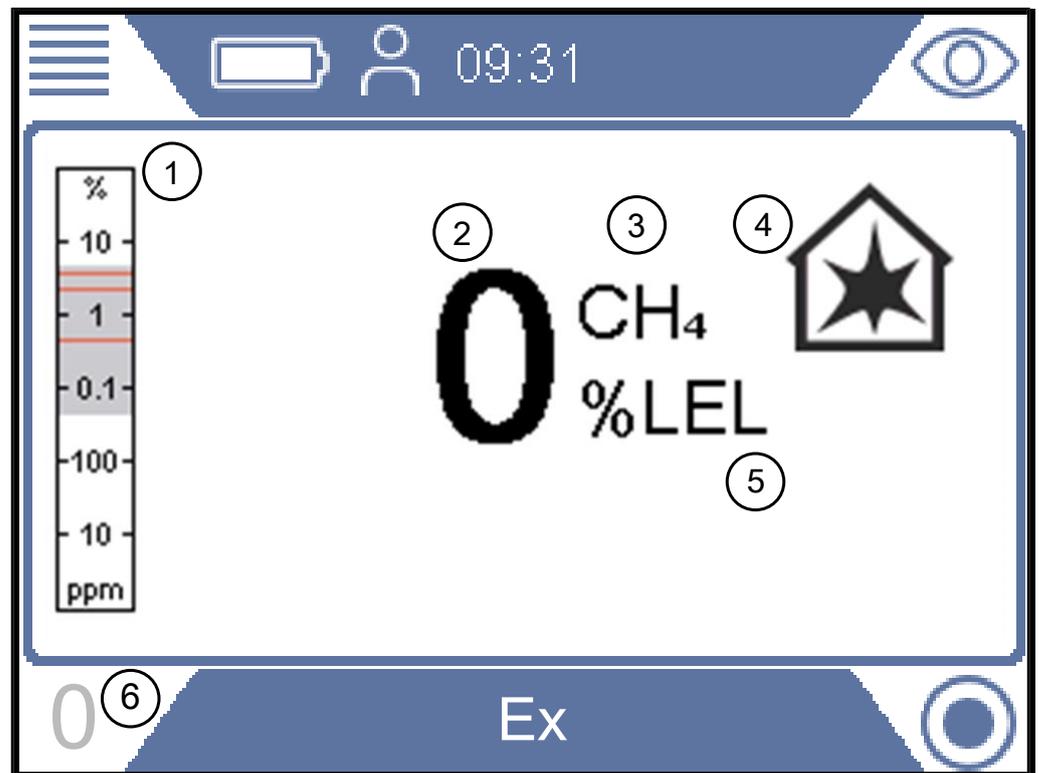


Fig. 22: "Ex" display

1	Analog bar indicating range (grey), measurement value (blue) and alarm settings (red lines) in Vol% (quasi-logarithmic scale)	2	Measurement value
3	Measured gas	4	Symbol of active operating mode
5	Unit of the measured value	6	Zeroing button, if needed. Zeroing symbol disappears if gas is detected.

±Measurement range

Measurement range

1 - 100 %LEL methane

You can readjust the zero point of the %LEL value if needed. Press lower left button if "0" appears in blue.

If required, change the primary target gas from methane (CH₄) to propane (C₃H₈) or butane (C₄H₁₀). The leak detector will then recalculate the signals to propane or butane values using a certified correlation curve.

Use this feature if you need to work on LPG installations.

For changing gas type see "Change gas type for %LEL measurement [▶ 76]".

 **WARNING**
Explosion risk may exist when "alive" signal not present.

When operating in any of the two safety related modes Ex and Ex Tox respectively, the leak detector will confirm its proper function with a short acoustic "alive" signal every 20 s and by the status LED being green.

- ▶ Leave hazardous areas immediately if the alive signal does not sound every 20 s.
- ▶ Do not use the leak detector until it operates normally again.

**Status LED**

Keep an eye on the status LED when working in either of the safety certified modes Ex or Ex Tox. The LED is green when the leak detector works properly and no gas alarm is activated.

Listen also for the acoustic "alive signal" that beeps every 20 s to indicate normal operation if there are no gas alarms.

The status LED changes to red when a gas alarm is triggered or an error exists. Status LED is yellow in special states such as when in setting menus or calibration etc. Blue status LED means normal operation in all other modes.

Ex

The acoustic signal and the status LED are the primary alarm signals. All gas alarms have a latching function. After a gas alarm is triggered, a check mark key appears in the upper right corner of the display.

You can mute the acoustic alarm by pressing the check mark key. The alarm will come on again if a new alarm is triggered.



After the leak detector has been exposed to high methane concentrations, it often displays increased measurement values in the ppm range for a few minutes. This is a normal behavior of the leak detector due to gas residues inside the leak detector.

5.3.10 Operating mode "Ex Tox"

This operation mode is used to monitor and warn for explosive and toxic gas concentrations as well as oxygen deficiency in the working area.

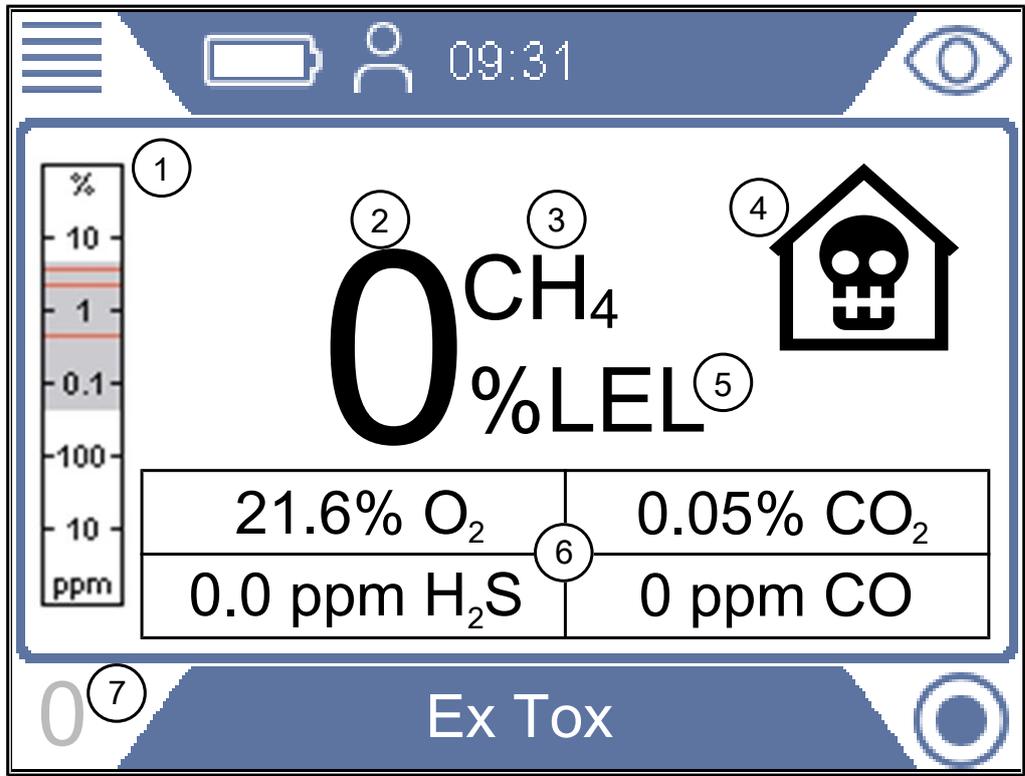


Fig. 23: "Ex Tox" display

1	Analog bar indicating range (grey), measurement value (blue) and alarm settings (red lines) of flammable gas in Vol% (quasi-logarithmic scale)	2	Measurement value
3	Measured gas	4	Symbol of active mode
5	Unit of the measured value	6	Measurement values of toxic gases and oxygen in ppm and Vol% respectively
7	Zeroing button, if needed. Zeroing symbol disappears if gas is detected.		

The leak detector shows the gas concentrations of CH₄, CO₂, CO, H₂S and O₂.

Measurement range	Gas	Measurement range
	CH ₄ , C ₃ H ₈ or C ₄ H ₁₀	1 - 100% LEL
	CO ₂	0.1 - 5 Vol%
	CO	1 - 500 ppm
	H ₂ S	1 - 400 ppm
	O ₂	0.1 - 25 Vol%

Table 18: Measurement range

You can readjust the zero point of the %LEL value if needed. Press lower left button if "0" appears in blue.

If desired you can change the primary target gas from methane (CH₄) to propane (C₃H₈) or butane (C₄H₁₀). The leak detector will then recalculate the signals to propane or butane values using certified correlation curves.

Use this feature if you need to work on propane or butane installations.

For changing gas type see "Change gas type for %LEL measurement [▶ 76]".

WARNING

Explosion risk may exist when "alive" signal not present.

When operating in any of the two safety related modes Ex and Ex Tox respectively, the leak detector will confirm its proper function with a short acoustic "alive" signal every 20 s and by the status LED being green.

- ▶ Leave hazardous areas immediately if the alive signal does not sound every 20 s.
- ▶ Do not use the leak detector until it operates normally again.



Status LED

Keep an eye on the status LED when working in either of the safety certified modes Ex or Ex Tox. The LED is green when the leak detector works properly and no gas alarm is activated.

Listen also for the acoustic "alive signal" that beeps every 20 s to indicate normal operation if there are no gas alarms.

The status LED changes to red when a gas alarm is triggered or an error exists. Status LED is yellow in special states such as when in setting menus or calibration etc. Blue status LED means normal operation in all other modes.

Ex Tox

The acoustic signal and the status LED are the primary alarm signals. All gas alarms have a latching function. After a gas alarm is triggered, a check mark key appears in the upper right corner of the display.

You can mute the acoustic alarm by pressing the check mark key. The alarm will come on again if a new alarm is triggered.



After the leak detector has been exposed to high methane concentrations, it often displays increased measurement values in the ppm range for a few minutes. This is a normal behavior of the leak detector due to gas residues inside the leak detector.



NOTICE

Measuring of high gas concentrations of H₂S or CO reduces sensor life time.

Frequent measuring of high gas concentrations will reduce the life time of the sensors for the detection of toxic gases.

Set Time Weighted Average (TWA)

The leak detector has a TWA-Function (Time Weighted Average Function) with which alarms can be given according to LTEL (Long Term Exposure Limit) or STEL (Short Term Exposure Limit). The LTEL value and the STEL value correspond to the maximum dose of a substance to which a person should be exposed over a defined period.

- STEL is the weighted average value over 15 minutes (for the respective toxic gas).
- LTEL is the weighted average value over 8 hours (for the respective toxic gas).

To set the Alarm Level for LTEL and STEL, see "Set limits and alarm levels [▶ 48]".



NOTICE

The TWA calculations are reset when you switch from Ex Tox to another operating mode.

For changing gas type see "Change gas type for %LEL measurement [▶ 76]".

5.3.10.1 Change gas type for %LEL measurement

✓ Login as Intermediate or Advanced

▶ > > General > Misc (Tab) > Select gas

⇒ Choose between methane (CH₄), propane (C₃H₈) or butane (C₄H₁₀).

This option is only valid for the LEL measurement (operating modes Ex and Ex Tox).

5.3.11 IR Ethane Analysis and compensation



Incorrect Ethane compensation value can result in significant deviation in the estimated methane concentration, in the operating modes "Above Ground", "Bar Hole", "House" and "Gas Purity".

Why an IR Ethane Analysis?

This function is mainly used to distinguish between natural gas and swamp gas from underground biological decay. Natural gas contains varying concentrations of ethane while swamp gas does not.

Such analysis is traditionally made with a gas chromatograph. With IRwin the same analysis with similar sensitivity is performed much faster. Instead of the typical 5 to 10 minutes a gas chromatograph requires for an analysis IRwin only needs a few seconds.

The second purpose of the IR Ethane Analysis is to establish the ethane concentration for compensation at high methane levels.

The IR Ethane Analysis can be made from below 1 to 8 Vol% ethane in the natural gas. The resolution is 0.1% and the accuracy better than 1 Vol%.

INFICON single-cell wide range technology (patent-pending)

IRwin methane leak detector employs the unique INFICON single-cell wide range technology to detect all concentrations from 1 ppm to 100 Vol% methane. This technology is very sensitive to the ethane content in the natural gas. Therefore, large deviations can occur at higher gas concentrations if the ethane concentration is not compensated for.

The leak detector has a built-in routine for ethane compensation. The ethane content can be entered manually, if known. A more practical way is to use the IR Ethane Analysis function to measure the ethane content and automatically set the compensation concentration. The safety certified modes Ex and Ex Tox are not affected by this phenomenon.



IRwin SXG and SXGT models also have GC Ethane Analysis capability for distinguishing between Natural gas (NG), liquid petroleum gas (LPG) and swamp gas by determining the presence of methane, ethane and propane in the sampled gas.

The GC Ethane Analysis function is not affecting the ethane compensation.

5.3.11.1 Entering ethane concentration manually

If you know the current ethane concentration in your natural gas you can enter this value manually. We recommend, however, that you use the built-in IR Ethane Analysis to determine the ethane concentration as this typically varies from day to day and from location to location.

✓  Login as Intermediate or Advanced

1  >  > IR Ethane Analysis > Settings (Tab)

2 Select "Ethane (%) for Compensation".

3 Set the desired ethane concentration.

⇒ The value shown is the current setting. The last value (indicated by an "A") is the result of the last IR Ethane Analysis.

4 Leave the view via .

5.3.11.2 Setting reminder for IR Ethane Analysis

You can set the detector to remind you to make an IR Ethane Analysis. If set, the detector will ask if you want to perform a new IR Ethane Analysis or keep the current value.

1  >  > IR Ethane Analysis > Settings (Tab)

2 Select "Reminder for Ethane Compensation Analysis".

3 Select between the following settings:

Off	No reminder
Start-up	Reminder first time you enter "Bar Hole" mode after start-up of detector (10 s delay)
Always	Reminder every time you enter "Bar Hole" mode (10 s delay).

Table 19: Setting reminder for IR Ethane Analysis

5.3.11.3 Performing IR Ethane Analysis after automatic reminder

You need a methane concentration in the range of 5 to 15 Vol% to perform the IR Ethane Analysis. The compensation is only needed for high gas concentrations and is therefore only needed when you have found a significant leak.

You should connect the Bell probe before performing the IR Ethane Analysis.

- 1** Change to operating mode "Bar hole".
 - ⇒ If reminder is activated a window will appear showing the current ethane concentration setting. The leak detector asks if you want to keep the current value or a make a new analysis.
- 2** Select "New" and press the bell firmly down onto the place where you found the gas.
 - ⇒ A number between 0 and 100 appears on the display.
- 3** If the value is smaller than 20, push the probe harder onto the surface or look for a place with higher methane concentration. If the value is higher than 80 you should move the bell away from the leak to find a spot with lower concentration.
 - ⇒ Try to make the signal stabilize at a value between 20 and 80. When succeeding, the detector will need another 2-3 seconds to calculate the ethane concentration. The result is displayed as % C₂H₆.
 - ⇒ Press check mark to continue. IRwin will ask if you want to "Save Ethane Concentration for Compensation".
 - ⇒ Select "No" if analysis was made for confirming natural gas or "Yes" to use for compensation. If selecting "Yes" the value is saved as ethane concentration and shown in the C₂H₆ field.
See Operating mode "Bar Hole" [▶ 59].
 - ⇒ An ethane concentration value of 1 % or higher is a safe indication of natural gas. A value between 0.4 and 1 % is a probable indication of natural gas.



If the measured ethane values are between 0 and 2% it is recommended that you repeat the measurement at least 3 times on the same position to check the result is consistent.

5.3.11.4 Starting IR Ethane Analysis manually

- 1  >  > IR Ethane Analysis > Start (Tab)
- 2 Press button next to check mark to start.
- 3 Press the bell firmly down onto the place where you found the gas.
 - ⇒ A number between 0 and 100 appears on the display.
- 4 If the value is smaller than 20, push the probe harder onto the surface or look for a place with higher methane concentration. If the value is higher than 80 you should move the bell away from the leak to find a spot with lower concentration.
 - ⇒ Try to make the signal stabilize at a value between 20 and 80. When succeeding, the detector will need another 2-3 seconds to calculate the ethane concentration. The result is displayed as % C₂H₆.
 - ⇒ Press check mark to continue. IRwin will ask if you want to "Save Ethane Concentration for Compensation".
 - ⇒ Select "No" if analysis was made for confirming natural gas or "Yes" to use for compensation. If selecting "Yes" the value is saved as ethane concentration and shown in the C₂H₆ field.
See Operating mode "Bar Hole" [▶ 59].
 - ⇒ An ethane concentration value of 1 Vol% or higher is a safe indication of natural gas. A value between 0.4 and 1 Vol% is a probable indication of natural gas.



If the measured ethane values are between 0 and 2% it is recommended that you repeat the measurement at least 3 times on the same position to check the result is consistent.

5.3.11.5 Viewing IR Ethane Analysis info

Display the date of the last IR Ethane Analysis as follows.

- ▶  >  > IR Ethane Analysis > Info (Tab)
 - ⇒ The date and the time of the last C₂H₆ Analysis will be shown.
 - ⇒ IRwin SXG and SXGT will also show the time of the last IR Ethane Analysis.

5.3.12 Calibration (adjustment)



Calibration is interpreted differently in different countries and applications. Throughout this document we therefore use the following definitions:

Function Test: Exposing to given gas(es) checking if accuracy of a certain measurement is within specified accuracy and to judge whether calibration adjustment is needed.

Calibration: Exposing to given gas(es) and, if required, automatically adjusting the detector to display the given concentration within specified accuracy.

The built-in calibration routines guide you through the adjustment of the leak detector sensitivity to the various test gases. You can set calibration intervals for the different adjustments and will then get a reminder when calibration is due ("Adjust calibration reminder").

The description below covers all possible modes. Only part of them are activated depending on the actual setting of the detector.



Allow IRwin to warm up for 1 hour before calibrating for best accuracy.

The calibration intervals recommended for the operating modes Ex and Ex Tox are based on the TÜV certificates for these operating modes. For the other modes these time intervals are chosen to give you the best performance. In any case you should use the results of the various function tests to judge whether a calibration is needed. If you want to perform more than one calibration procedure at a given time you should run them in the following sequence for best performance.

1. Above Ground if DVGW mode is enabled
2. Universal (low range) if Universal or Universal+ mode is enabled
3. Ex CH₄ (IRwin SX, SXT, SXG and SXGT only)
4. Tox (IRwin SXT and SXGT only)
5. Bar Hole CH₄ or Universal (high range) if Universal or Universal+ mode is enabled
6. Bar Hole CO₂ or Universal (20% CO₂) if Universal or Universal+ mode is enabled

Recommended calibration check intervals

- Above Ground CH₄ - weekly

With this calibration you calibrate the higher range (Vol%) of the modes House and Bar Hole at the same time.

- Universal (low range) - weekly
For calibration adjustment of Universal (low range) you need one, two or three gases as specified in section “Concentration of calibration and test gases”, see Concentration of calibration and test gases [▶ 35].
- Tox - weekly
For calibration in Ex Tox mode you need Tox mix.
The CO₂ calibration of other modes is not affected. CH₄ of the operation mode Ex is also calibrated during the Ex Tox calibration. However, for best performance, it is recommended to perform the Ex calibration after the Ex Tox calibration.
- Ex CH₄ - weekly
For calibration in Ex mode you need the following gas concentrations:
2.2% CH₄.
- Bar Hole CO₂ / Universal (20.0% CO₂) - monthly
For calibration of the CO₂ measurement of Bar Hole you need the following gas concentrations: 20% CO₂.



This calibration does not influence the toxic CO₂ calibration (ppm) in the Ex Tox calibration routine.

- Bar Hole CH₄ / Universal (high range) - monthly
For calibration of the CH₄ measurement of Bar Hole you need the following gas concentrations:
2.2% CH₄, 100% CH₄.
Beside the calibrations of the application mode “Bar Hole” the application modes “Gas Purity” and “Confined Space” will be calibrated in the higher measurement range (Vol%), too.
- GC Ethane Analysis (normally not required)
Calibration of the GC is normally done after service to the GC but can also be done if the GC graphs look abnormal. This can be the case if the GC sensor has been subjected to high gas concentrations.
GC calibration is done using 50 %LEL CH₄ (2.2 or 2.5 Vol% depending on LEL setting) and is only accessible if logged in as advanced user.
For full functionality you must perform a GC Function Test directly after performing a GC calibration.

WARNING

Explosion, asphyxiation, toxic risk

Incorrect calibration leads to incorrect measurement results. Thus you are not properly warned against any possibly dangerous gas concentrations.

- ▶ Calibrate the leak detector only when you have been properly trained.
- ▶ Calibrate the detector in well ventilated rooms or outdoors.

**The methane calibration is possible with gas mixtures in synthetic air only.**

The natural background of CO₂ (typically 400 ppm) in ambient air will offset the calibration.

Fresh air exposure should, however, always be by ambient air.



After the leak detector has been calibrated with 100% methane it shows a few ppm increase in the measured value for a few minutes. This is a normal behavior of the leak detector and due to gas residues inside the leak detector.

**Retrieving
information about the
calibration**

The leak detector saves the date and the time of the last successful calibration.

▶ ☰ > ⚙ > Calibration > Info (Tab)

5.3.12.1 Standard calibration procedures

Prepare calibration For a complete calibration you need the gases listed, see "Concentration of calibration and test gases [▶ 35]".

It is not necessary that you calibrate all modes at the same time.

Mode	Calibration Routine				
	Above Ground Universal (low range)	Ex	Tox	Bar Hole CH ₄ Universal (high range)	Bar Hole CO ₂ Universal (CO ₂)
Above Ground	X				
Universal (low range)	X				
Bar Hole				X	X
Universal (high range)				X	X
Plants	X				
House	X				
Gas Purity				X	
Ex		X	X*		
Tox			X*		

Table 20: Standard calibration procedures

**Ex Tox calibration routine also calibrates Ex mode.*

No need to run Ex calibration routine separately if Ex Tox calibration has been performed.

GC calibration of the timing of the different peaks can be made when logged in as Advanced user. Peak height is not calibrated and should not be used as indication of the concentration.



Calibrate Above Ground / Universal (low range) first for best performance.

We strongly recommend using so called ODFRs (On Demand Flow Regulators) to administrate calibration and test gases to the instrument. These regulators automatically supplies the exact gas flow aspired by the instrument and automatically shuts off when disconnected from the sample input.

It is also possible to use other calibration stations for the calibration. However, the following requirements have to be fulfilled.

- The gas flow delivered by the calibration station must be higher than the flow aspirated by the leak detector. Set the gas flow to at least 80 l/h.
- The gas must be delivered at ambient pressure (i.e., do not push gas into the leak detector). The normal way to accomplish this is to create an open connection between gas container and detector inlet so that the excess calibration gas is vented to the ambient. This exhaust should be placed outside the test room, preferably outdoors.

Calibration

- ✓   Login as Intermediate or Advanced
- ▶  >  > Calibration > Calibration (Tab)
 - ⇒ Select the calibration to perform and click the check mark button.
 - ⇒ The leak detector leads you through the process by indicating which gas to deliver to the detector in each step. Make sure that no residual gases are present in the ambient during Fresh Air step. Most common problems occur if you used 2.2 Vol% or 100 Vol% methane shortly before the trying to calibrate with 10 ppm or 100 ppm methane.
 - ⇒ A successful calibration is confirmed by a green check mark.
 - ⇒ A failed calibration is indicated by a red cross.



You can continue to use the leak detector even if calibration failed. The previous calibration parameters are restored.

5.3.12.2 Setting of calibration gas concentrations



Accuracy can be affected by calibration gas tolerance.

For optimum performance adjust the concentrations of the calibration gases set in the leak detector to the actual composition of your calibration gases.

For optimum performance of your leak detector you should use the proposed calibration gases. The exact concentrations of the gas delivered often deviates slightly from these values due to tolerance factors etc. The exact value is typically stated on the analysis certificate of the respective gas. You should therefore adjust the concentrations of the calibration gases set in the detector to match the actual composition of your calibration gases, see "Concentration of calibration and test gases [▶ 35]".

- ✓   Login as Intermediate or Advanced
- 1  >  > Calibration > Settings (Tab)
- 2 Select calibration routine first and then select the gas to adjust (if several).
- 3 Confirm your selection with .
- ⇒ A window appears with controls for adjusting the gas selected.

- 4 Set the exact gas concentration value via drop-down menus. The leak detector shows the gas to adjust in the window and the currently stored concentration appears just below the setting line. You cannot set the concentration outside the range.
- 5 Select "Set" to confirm new value or "Reset" to restore the default value.



If changing a calibration gas concentration you must check if the same gas is used in several calibration routines.

If so, you must adjust the concentration of that gas in all relevant routines.

5.3.12.3 Adjust calibration reminder

You can set an Interval for a calibration reminder for each of the calibration types. The Interval is set to Off as default, meaning no reminder.



Unless required by the relevant regulations there is no need to calibrate (includes adjustment) if function test for that specific mode passes.

Activate calibration reminder

✓  Login as Intermediate or Advanced

1  >  > Calibration > Interval (Tab)

2 Select the operation mode for which you want to set a calibration reminder and set the desired period of time.

3 Leave the view via .

The leak detector saves the set period of time automatically.

5.4 Performing function tests



Correct readings only if settings are correct.

If the leak detector does not work correctly, it may not show every leak.

- ▶ Test the leak detector regularly as recommended.



Function tests are available for all tasks of the detector.

Some of these tests are typically called "bump tests".

Use the Function tests to test the status and accuracy of the leak detector. The leak detector will guide you through the test procedures and tell you when operator actions are needed.

Passing the function test means that specific detector function performs as specified. No adjustment (in this context called Calibration) is needed for that specific function.

Repeated failure of a function test is an indication that the detector needs calibration for that particular function. See "Calibration (adjustment) [▶ 81]".

Once you have set the function test intervals, the leak detector will remind you to perform the respective Function test, see "Setting the Function Test Interval [▶ 51]".

Recommended Function test intervals (based on IRwin model)

- Before starting work / bump testing

For leak surveys we recommend performing a 10 ppm bump test before starting survey. This is required by German DVGW and local regulations in several other countries. If your survey limit is higher or you are using IRwin for another purpose it is possible to use either 500 ppm or 2.5 Vol% instead. Select desired gas by adjusting the function test gas. See, "Universal Fnc Test conc / AbG Fnc Test conc [▶ 50]".

- Ex: 2.2 - 2.5 Vol% CH₄ depending of country
- Ex Tox: Daily (2.2% CH₄, CO₂, CO, O₂, H₂S)

We strongly recommend using so called ODFRs (On Demand Flow Regulators) to administrate calibration and test gases to the instrument. These regulators automatically supplies the exact gas flow aspired by the instrument and automatically shuts off when disconnected from the sample input.

It is also possible to use other calibration stations for the calibration. However, the following requirements have to be fulfilled.

- The gas flow delivered by the calibration station must be higher than the flow aspired by the leak detector. Set the gas flow to at least 80 l/h.
- The gas must be delivered at ambient pressure (i.e., do not push gas into the leak detector). The normal way to accomplish this is to create an open connection between gas container and detector inlet so that the excess calibration gas is vented to the ambient. This exhaust should be placed outside the test room, preferably outdoors.

✓ To perform the Function test, you need fresh air and either 10 ppm CH₄ or 50% LEL CH₄ in synthetic air. For IRwin SXT and SXGT you will also need the ToxMix gas mixture.

1 Check the leak detector for visible damage.

2  >  > Function Test > Test (Tab)

3 Select the desired function test from the list.

4 Start the selected Function test by pressing .

⇒ The leak detector guides you through the process.

You can display the date of the last function test.

▶  >  > Function Test > Info (Tab)

This time is the basis for the next function test reminder. Refer to "Setting the Function Test Interval [▶ 51]".



Function tests are optimized for factory default concentrations. Using other concentrations, even if within the adjustable calibration or function test concentration range, can make the automatic function test interpretation invalid.

If you fail function test and you are using non-standard gases we recommend that you test the instrument by simply exposing the respective mode for the test gas and observe the reading. This way you can still verify the function but the last passed function test will not be logged if automatic interpretation failed.

5.5 Measuring

- ✓ Connect the leak detector to the desired probe. See "Function [▶ 13]".
 - 1 Switch on the leak detector by pressing the I/O key.
 - 2 Complete the self test.
 - 3 Make sure that the desired basic settings are correct. See "Quick Set-up [▶ 44]".
 - 4 Make sure that the settings for the desired operating mode are correct. See "Operating modes [▶ 53]".
 - 5 Switch to the desired operating mode.
 - 6 Consider all relevant regulations for the operation in question.
 - 7 Record the measured values if desired. See "Logging data to file [▶ 90]".
 - 8 Start measuring.

5.6 Perform self test

When you turn on the leak detector it will automatically perform a self test for the main components such as software and parameter memories, battery, gas sensors, valve(s), pumps, buzzer and status LED.

If not all test are passed successfully it may be that some operating modes cannot work properly. That is indicated by the status LED being yellow. The test can, for example, fail because you accidentally blocked an inlet during the test.

If the problem has been solved it is possible to re-start the self test sequence and get the detector into normal operation mode without having to re-start the complete system.

▶  >  > Function Test > Test (Tab)

To understand more about the causes of test failure and the leak detector staying in a special state see "Warnings and error messages [▶ 90]".

5.7 Viewing Status menu

You are able to read the current status of the self diagnostic functions of the system in a menu.

When troubleshooting or contacting the service, use this information.

▶  >  > Status

5.8 Logging data to file

IRwin can log data in all operating modes. This is especially practical to save data from leak surveys in Above Ground mode.

Starting/stopping the data logging.

- ✓ You have configured the data logging, see "Configure data logging [▶ 50]".
- ✓ You have set the leak detector in operating mode Above Ground.
 - 1 To start or stop the logging press  or  in the measurement screen.
 - 2 Confirm your choice.

Deleting files is only possible with IRwin App software, see "Transfer data to computer [▶ 52]".

5.9 Information

During operation, the display shows information that helps you operate the leak detector. Activated operation mode, warnings and error messages are shown in addition to the measurement values.

The leak detector is equipped with extensive self-diagnostic functions. If the electronics detect an incorrect state, the leak detector displays this as far as possible and interrupts operation when necessary.

5.9.1 Retrieve information and statistics

Call up detector information

- 1  >  > ABOUT.
- 2 Leave the view via .

Call up statistics

- 1  >  > STATISTICS
- 2 Leave the view via .

5.9.2 Warnings and error messages

Warnings

Warnings are given for conditions that can impair the accuracy of measurements. The operation of the leak detector is normally not interrupted but some functions may be barred or indicated as non-compliant by status LED being yellow and values being red instead of black.

If the navigation button "Menu"  is colored red this means that there has been an error that you have not yet checked. If the cause of the error remains there will be a new warning/error alarm and a new entry in the error log. The navigation button turns blue again when you have read the warnings list.

Open the warnings log list:

- ▶  >  > Warnings

Error messages

Errors are events that force the interruption of the operation. Errors are also logged in the warnings log list.



The division between errors and warnings is sometimes not very clear. In both cases it is worth restarting the detector to try to pass the self - test again. Charging the battery also reduces the risk for some errors and warnings.

No.	Message	Possible error sources	Remedy
Warnings			
-	Red LED / Constant beep	HW Watchdog triggered	Perform hard switch off. Restart detector. If problems remains: Contact INFICON service.
W2	Reference Inlet Blocked	Reference inlet blocked	Check that nothing is blocking the inlet.
		Reference inlet filter clogged	Contact INFICON service.
W3	Sample Inlet Blocked	Sample inlet blocked	Check that nothing is blocking the inlet
		Sample inlet filter blocked	Replace cigarette filter in sample inlet.
		Blockage in accessory	Disconnect accessory. If alarm disappears: Check accessory.
		Internal filter blocked	Disconnect accessories. If alarm remains: Contact INFICON service.
W4	Exhaust Blocked	Exhaust blocked	Check that nothing is blocking the exhaust. If alarm remains: Contact INFICON service.
W5	O ₂ sensor error	System error	Restart detector. If problems remains: Contact INFICON service.
W6	O ₂ sensor error	System error	Restart detector. If problems remains: Contact INFICON service.
W7	H ₂ S sensor error	System error	Restart detector. If problems remains: Contact INFICON service.
W8	H ₂ S sensor error	System error	Restart detector. If problems remains: Contact INFICON service.
W9	CO sensor error	System error	Restart detector. If problems remains: Contact INFICON service.
W10	CO sensor error	System error	Restart detector. If problems remains: Contact INFICON service.
W11	CH ₄ sensor error	System error	Restart detector. If problems remains: Contact INFICON service.
W12	CH ₄ sensor error	System error	Restart detector. If problems remains: Contact INFICON service.
W13	CO ₂ sensor error	System error	Restart detector. If problems remains: Contact INFICON service.

No.	Message	Possible error sources	Remedy
W14	CO ₂ sensor error	System error	Restart detector. If problems remains: Contact INFICON service.
W17	H ₂ S STEL level reached, (STEL and limit shown,Confirm)	Short Term Exposure alarm for H ₂ S.	Normal function. If warning reapperas without any gas present: Recalibrate TOX mode. If still reappearing: Contact INFICON service
W18	H ₂ S LTEL level reached, (LTEL and limit shown,Confirm)	Long Term Exposure alarm for H ₂ S.	Normal function. If warning reapperas without any gas present: Recalibrate TOX mode. If still reappearing: Contact INFICON service
W19	CO STEL level reached, (STEL and limit shown,Confirm)	Short Term Exposure alarm for CO	Normal function. If warning reapperas without any gas present: Recalibrate TOX mode. If still reappearing: Contact INFICON service
W20	CO LTEL level reached, (LTEL and limit shown,Confirm)	Long Term Exposure alarm for CO	Normal function. If warning reapperas without any gas present: Recalibrate TOX mode. If still reappearing: Contact INFICON service
W21	CO ₂ STEL level reached, (STEL and limit shown,Confirm)	Short Term Exposure alarm for CO ₂ .	Normal function. If warning reapperas without any gas present: Recalibrate TOX mode. If still reappearing: Contact INFICON service
W22	CO ₂ LTEL level reached, (LTEL and limit shown,Confirm)	Long Term Exposure alarm for CO ₂ .	Normal function. If warning reapperas without any gas present: Recalibrate TOX mode. If still reappearing: Contact INFICON service
Error messages			
E1	Main Pump error	Exhaust blocked	Check that nothing is blocking the exhaust. If alarm remains: Contact INFICON service.
		Reference inlet blocked	Check that nothing is blocking the reference inlet. If alarm remains: Contact INFICON service.
		Pump dirty or broken	Contact INFICON service.
E2	Sample Pump error	Sample pump not running	Restart detector. If problems remains: Contact INFICON service.
E3	IR Lamp error	IR Lamp error	Restart detector. If problems remains: Contact INFICON service.
E4	IR Lamp error	IR lamp supply error	Restart detector. If problems remains: Contact INFICON service.

No.	Message	Possible error sources	Remedy
E5	Battery level too low (count down to power off)	Battery low	Switch off detector and charge battery
E7	SnO ₂ voltage error	System error	Restart detector. If problems remains: Contact INFICON service.
E8	Detector shuts down	System error	Restart detector. If problems remains: Contact INFICON service.
E9	Red LED and constant beep	HW watchdog triggered	Perform hardware reset. Restart detector. If problems remains: Contact INFICON service.
E10	O ₂ Sensor bias lost	O ₂ sensor bias lost due to uncontrolled shut down.	Check in Ex Tox mode that O ₂ value is OK (close to 20.9%). If not, leave the detector on until O ₂ sensor shows 20 - 22% in air. This can take up to 12 hours.
E11	"IR Lamp" has red cross in function test result screen.	IR system error	Restart detector. If problems remains: Contact INFICON service.
E12	"Pump & Valve" test has red cross in function test result screen.	Exhaust blocked	Restart detector. If problems remains: Contact INFICON service.
		Pump dirty or broken	Contact INFICON service.
E13	"Pump & Valve" test has red cross in function test result screen.	Valve clogged	Restart detector. If problems remains: Contact INFICON service.
		System error	Restart detector. If problems remains: Contact INFICON service.
E14	"Pump & Valve" test has red cross in function test result screen.	Exhaust blocked	Check that nothing is blocking the exhaust. If alarm remains: Contact INFICON service.
		Reference inlet blocked	Check that nothing is blocking the reference inlet. If alarm remains: Contact INFICON service.
		Pump dirty or broken	Contact INFICON service.
E15	"Gas Sensors" has red cross in function test result screen.	Sensor error or warm-up drift	Restart detector. If problems remains: Contact INFICON service.
E16	"Gas Sensors" has red cross in function test result screen.	Sensor error or warm-up drift	Restart detector. If problems remains: Contact INFICON service.
E17	"Gas Sensors" has red cross in function test result screen.	Sensor error or warm-up drift	Restart detector. If problems remains: Contact INFICON service.

No.	Message	Possible error sources	Remedy
E18	"Buzzer" has red cross in function test result screen.	Buzzer "hole" blocked or filled with water	Dry and clean buzzer hole. Restart detector. If problems remains: Contact INFICON service.
E19	"LED" has red cross in function test result screen.	LED broken	Contact INFICON service.
E20	RAM test error (Power off)	Memory damaged or test error	Restart detector. If problems remains: Contact INFICON service.
E21	ROM test error (Power off)	Memory damaged or test error	Restart detector. If problems remains: Contact INFICON service.
E22	CRC error (power off)	Memory damaged or test error	Restart detector. If problems remains: Contact INFICON service.
E23	"Gas Sensors" has red cross in function test result screen.	Sensor error or warm-up drift	Restart detector. If problems remains: Contact INFICON service.
E24	No message given	Service info only	No action needed.
E25	Surrounding temperature is outside of rated temperature. Function might be affected	Instrument temperature is too high or too low	Explosion protection cannot be guaranteed. Immediately move detector to cooler place or switch OFF if flammable gases could be present.

Table 21: Warnings and error messages

5.9.3 Viewing the Service Screen

On the service screen you will find details about sensor signals and monitored supply voltages, for example. During contact with the service department this could be useful.

✓  Login as Advanced

▶  >  > Service Screen

5.10 Switching OFF

Switching OFF

1 Press the "On / Off" key for 3 seconds.

⇒ The leak detector asks whether you want to switch off the instrument.

2 Select "Yes" and press the check mark key.

Hard switch off

Some errors can make the leak detector go into watchdog state. The acoustic alarm beeps continuously and the status LED is red. The leak detector may not even be reacting to the menu buttons. If this happens you must turn the leak detector off. Press and hold the "On / Off" key until the detector shuts down (roughly 9 s).

Do not use this option without cause. You risk losing settings and the bias of the oxygen sensor on SXT and SXGT models. This leads to a prolonged warm up at next power on. It can take up to 12 hours to stabilize the oxygen sensor if sensor bias is lost form more than a few minutes. If you need to do a hardware switch off you should restart the leak detector immediately, If the leak detector malfunctions again you will need to contact INFICON service.

- 1** Press the "On / Off" key for 9 seconds.
- 2** Restart the leak detector as soon as possible to restore O₂ sensor bias (IRwin SXT and SXGT).

6 Maintenance

The gas inlet of the instrument, as well as the probe system include various filters. These must be replaced at intervals specified in the maintenance plan. If the leak detector is used in dirty environments, more frequent replacements may be necessary.



The internal sample inlet filter can become clogged.

Running the leak detector with no probe connected can make the internal filters clogged. This can cause need for service.

6.1 Maintenance plan

Maintenance cycle	Additional information	
daily	6.4.2	Change the cigarette filter in the sample inlet
	6.5	Maintenance of the hand probe
weekly	6.5	Maintenance of the hand probe
	6.6	Maintenance of the carpet probe
monthly	6.6	Maintenance of the carpet probe
	6.7	Maintenance of the bell probe
	6.8	Maintenance of the swan neck
	6.9	Maintenance of the bar hole probe

6.2 Spare parts list

Spare part	Order number	Purpose
Filter cartridge 0.22 um	581-705	Carpet
Filter disk OD=8 mm	591-367	Bell
Dust filter, 8612	591-095	Bell, Swan Neck and Flexi Bell
Cigarette Filter 120-pack	581-700	Hand Probe and Sample inlet
Bar Hole Rubber	581-268	Seal for Bar Hole Probe

6.3 General check of probe system

The probe system used must be checked regularly for external damage and leaks.

- 1** Examine all parts of the probe system for external damages.
 - 2** Check that the rubber grip of the Hand Probe is not broken or missing.
The rubber is certified anti-static and must be replaced by original INFICON spare if damaged or missing.
 - 3** Connect the probe system to the instrument.
 - 4** Block the inlet of the probe system.
- ⇒ If the error message "Blocked flow alarm" appears, the probe system is sufficiently leak-proof. When the leak detector does not show an error there is a leak in the system.

6.4 Maintenance of the leak detector

6.4.1 Seasonal shut-down

IRwin SXT is using a small amount of power when shut off. This allows the clock to continue running and the function of oxygen sensor to be maintained for faster warm-up.

When you want to store the leak detector *up* to 3 months charge it fully.

When you want to store the leak detector *more* than 3 months select one of the following possibilities.

- ▶ Connect the charging equipment and leave the charger on.

OR:

- ▶ Charge the battery every 3 months as long as you store the leak detector.

6.4.2 Change the cigarette filter in the sample inlet

- ▶ Change the filter according to the maintenance plan, see "Maintenance plan [▶ 96]".

Be careful when checking the cigarette filter in the inlet, make sure that it is not deformed, otherwise it will loose part of its function. Replace the filter if in doubt.



6.5 Maintenance of the hand probe

Replace the filter in the tip of the probe according to the maintenance plan, see "Maintenance plan".

Be careful when checking the cigarette filter in the inlet, make sure that it is not deformed, otherwise it will lose part of its function. Replace the filter if in doubt.

Check the filter fitted on the hose according to the maintenance plan, see "Maintenance plan [▶ 96]". Replace if dirty or wet inside.



6.6 Maintenance of the carpet probe

- ▶ Change the inline filter according to the maintenance plan, see "Maintenance plan [▶ 96]".



6.7 Maintenance of the bell probe



Fig. 24: Flexi Bell

- ▶ Change the filter according to the maintenance plan, see "Maintenance plan [▶ 96]".

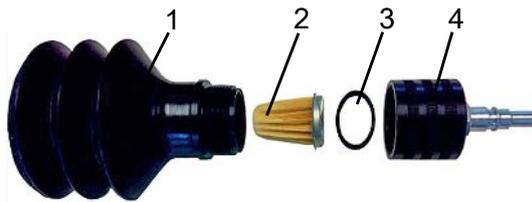


Fig. 25: Bell Probe

1	Bell	3	O-Ring
2	Paper filter	4	Filter housing

- 1 Screw off the top of the filter housing.
- 2 Remove the old paper filter and o-ring.
- 3 Place the o-ring around end cap on top of the new paper filter.
- 4 Place the filter and o-ring in the compartment of the filter housing.
- 5 Screw on the top tightly by hand.
- 6 Replace the bell probe.

6.8 Maintenance of the swan neck



Fig. 26: Swan Neck

Change the filter according to the maintenance plan, see "Maintenance plan [▶ 96]".

6.9 Maintenance of the bar hole probe

Rubber needs to be replaced when worn. Contact INFICON.



Fig. 27: Bar Hole Probe

7 Decommissioning the leak detector

7.1 Sending in the leak detector

 WARNING**Danger due to harmful substances**

Contaminated equipment can endanger the health. The contamination declaration serves to protect all persons who come into contact with the equipment.

► Fill in the declaration of contamination completely.

-
- 1 Please do not hesitate to contact us and send a completed declaration of contamination before sending anything to us.
 - ⇒ You will then receive a return number from us.
 - 2 Use the original packaging when returning.
 - 3 Before sending the instrument attach a copy of the completed contamination declaration. See below or on the homepage of INFICON.

Declaration of Contamination

The service, repair, and/or disposal of vacuum equipment and components will only be carried out if a correctly completed declaration has been submitted. Non-completion will result in delay.
 This declaration may only be completed (in block letters) and signed by authorized and qualified staff.

1 Description of product

Type _____

Article Number _____

Serial Number _____

2 Reason for return

3 Operating fluid(s) used (Must be drained before shipping.)

4 Process related contamination of product:

toxic	no <input type="checkbox"/> 1)	yes <input type="checkbox"/>	
caustic	no <input type="checkbox"/> 1)	yes <input type="checkbox"/>	
biological hazard	no <input type="checkbox"/>	yes <input type="checkbox"/> 2)	
explosive	no <input type="checkbox"/>	yes <input type="checkbox"/> 2)	
radioactive	no <input type="checkbox"/>	yes <input type="checkbox"/> 2)	
other harmful substances	no <input type="checkbox"/> 1)	yes <input type="checkbox"/>	

2) Products thus contaminated will not be accepted without written evidence of decontamination!

The product is free of any substances which are damaging to health

yes

1) or not containing any amount of hazardous residues that exceed the permissible exposure limits

5 Harmful substances, gases and/or by-products

Please list all substances, gases, and by-products which the product may have come into contact with:

Trade/product name	Chemical name (or symbol)	Precautions associated with substance	Action if human contact

6 Legally binding declaration:

I/we hereby declare that the information on this form is complete and accurate and that I/we will assume any further costs that may arise. The contaminated product will be dispatched in accordance with the applicable regulations.

Organization/company _____

Address _____ Post code, place _____

Phone _____ Fax _____

Email _____

Name _____

Date and legally binding signature _____
Company stamp _____

Copies:
 Original for addressee - 1 copy for accompanying documents - 1 copy for file of sender

7.2 Disposing of the equipment

The leak detector can either be disposed of by the owner or be sent to the manufacturer. The leak detector contains 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.



Information for recycling.

Li-ion

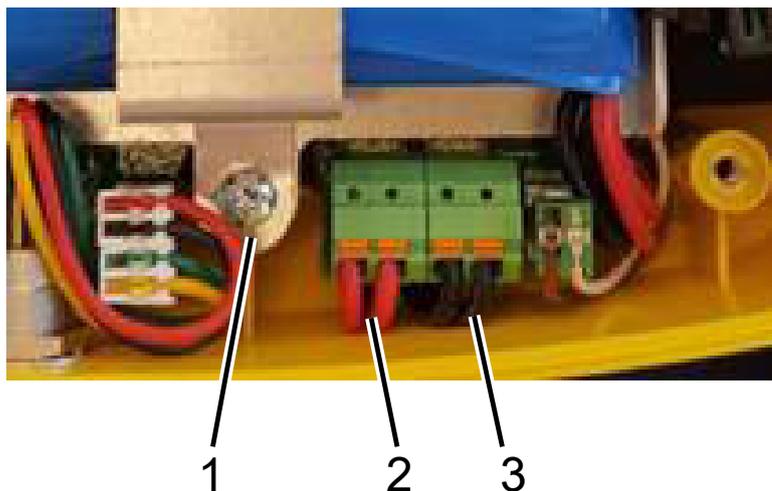


The leak detector cannot be scrapped with the normal domestic waste.

7.3 Safe battery removal



- 1 Use a Torx 10 driver to remove the six screw of the rear cover of the enclosure.
- 2 Pull of the rear cover.



1	Mounting screw
2	Red wires
3	Black wires

- ✓ The battery is connected to the circuit board with two red and two black wires.
- 1 Disconnect one of the four wires and isolate the end with electric tape.
 - 2 Repeat step 1 for all four wires.
 - 3 Use the Torx 10 driver to remove the two screws holding the battery bracket.
 - 4 Lift off bracket and remove battery.
 - 5 Dispose of battery according to local regulations.

8 Declarations of conformity



EU Declaration of Conformity

Manufacturer

INFICON AB
P.O. Box 76
SE-581 02 Linköping
Sweden

Phone: +46 (0)13-355900
e-mail: reach.sweden@inficon.com

Object of the declaration

IRwin® Methane Leak Detector . Models: SX, SXT, SXG, SXGT

The objects of the declaration as described above are in conformity with the relevant Community Directives, namely:

ATEX	Equipment intended for use in potentially Explosive Atmospheres (2014/34/EU)
EMC	Electromagnetic Compatibility (2014/30/EU).
RoHS	Restriction of the use of certain Hazardous Substances in electronic equipment (2011/65/EU).
LVD	Electrical safety - Low Voltage (2014/35/EU) *.
RED	Radio Equipment Directive (2014/53/EU)

* Relevant only for battery charger (CE marked). Separate declaration provided on request

See next page for details of standards applied.

For INFICON AB, August 08, 2023

Fredrik Enquist, Development Manager

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Harmonized European standards which have been applied

Standard	Edition	Comment
EN 60079-0	2018	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements.
EN 60079-11	2012	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i".
EN 80079-34	2018	Application of Quality system for Ex Equipment Manufacturing.
EN 61000-6-2	2005	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for industrial environments.
EN 61000-6-4	2007	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for industrial environments.
EN 50104	2010	Electrical apparatus for the detection and measurement of oxygen – Performance requirements and test methods
EN 50270	2015	Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen
EN 301 489-17	V3.2.4	ElectroMagnetic Compatibility (EMC) standard for radio equipment; Part 17: Specific conditions for Broadband Data Transmission Systems
EN 63000	2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
EN 300 328	V2.2.2	Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques

Other standards which have been applied

EN 50271	2010	Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen - Requirements and tests for apparatus using software and/or digital technologies. Replaced by edition 2018. No "Substantial change regarding ESRs" according to Annex ZY of EN 50271:2018.
EN 45544-1	2015	Workplace atmospheres - Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours - Part 1: General requirements and test methods. (Not applicable for IRwin SX and IRwin SXG)
EN 45544-2	2015	Part 2: Performance requirements for apparatus used for exposure measurement. (Not applicable for IRwin SX and IRwin SXG)
EN 60079-29-1	2007	Explosive atmospheres - Part 29-1: Gas detectors - Performance requirements of detectors for flammable gases. The equipment was verified by TÜV Rheinland to comply with draft version of edition 2016. All 13 major technical changes in edition 2016 are fulfilled.

ATEX Notified bodies:

ATEX quality assurance

ATEX RISE Research Institutes of Sweden
Box 857
50115 Borås, Sweden
Phone: +46 (0) 10 516 50 00
Notified body number: 0402

ATEX Explosion protection

SGS Fimko OY
Takomitie 8, FI-00380 Helsinki
Finland
Phone: +358 (0)9 898 361
Notified body number: 0598

ATEX LFL and Oxygen

TÜV Rheinland Industrie Service GmbH
Laboratory for explosion protection
Moltkeplatz 1, 45138 Essen
Germany
Notified body number: 0035

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UKCA Declaration of Conformity

Manufacturer

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e-mail: reach.sweden@inficon.com

Object of the declaration

IRwin® Methane Leak Detector . Models: SX, SXT, SXG, SXGT

The objects of the declaration as described above are in conformity with the relevant Community Directives, namely:

Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016.
Electromagnetic Compatibility Regulations 2016.
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012.
Electrical Equipment (Safety) Regulations 2016. *
The Radio Equipment Regulations 2017

* Relevant only for battery charger. Separate declaration provided on request

See next page for standards applied.

UK Approved body:

UKEX quality assurance

SGS Baseefa Limited
Rockhead Business Park, Staden Lane
Buxton, Derbyshire. SK17 9RZ, UK
Phone: +44 (0) 1298 766600
Approved body number 1180

UKEX Type examination certificate

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Phone: +44 (0) 1298 766600
Approved body number 1180

Report and Certificate reference numbers

No.	Issue	Subject
BAS21UKEX0575X	-	UK Type Examination Certificate
BASUKQAN7324	-	UK Quality Assurance Notification

For INFICON AB, August 08, 2023

Fredrik Enquist, Development Manager

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EN 45544-2	2015	Part 2: Performance requirements for apparatus used for exposure measurement. (Not applicable for IRwin SX and IRwin SXG)
EN 60079-29-1	2007	Explosive atmospheres - Part 29-1: Gas detectors - Performance requirements of detectors for flammable gases. The equipment was verified by TÜV Rheinland to comply with draft version of edition 2016. All 13 major technical changes in edition 2016 are fulfilled.

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