



# enCore Device Series

## Gas Quality Analyzer GasLab Q2



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**Manual**  
**Information for General Use**

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# 1 About this document

## 1.1 Aim / Scope / History

This document provides information to gas industry / process instrumentation professionals about the Honeywell® GasLab Q2, real-time natural gas analyzers from the enCore series of instruments, hereafter referred to as **Q2** for short.

The instruments determine calorific value, Wobbe index and other parameters in natural gas and are designed for operation in many hazardous areas. **GasLab Q2** covers a wide operating temperature range, allowing the analyzer to be placed close to the process to obtain a short response time.

Common applications include gas turbine control and regulation, fiscal energy measurement, and gas mixture analysis. For this purpose, the **Q2** uses the enSuite configuration and analysis software. (Details on the software in section

⇒ [8 Configuration and analysis software enSuite](#) (p. 169)

The manual explains the basic measuring instrument functions and describes installation, commissioning, operation, use and maintenance.

In addition to the general technical knowledge, this document enables safe and efficient handling of the Q2 .

For this purpose, you must have a good command of the documentation language, or use another translation of this document. The safety instructions and warnings on the instrument are in English or French.



**Depending on the field of activity, different basic knowledge is assumed. Notes on this can be found in the relevant sections. Definitions used in this document can be found in the glossary.**

Compliance with all the safety information and instructions set out in this information is a requirement for safe working practice and correct handling of the device and for correct measurement and calculation results.

Furthermore, the directives, standards, local accident prevention regulations and general safety regulations which apply to the field of application of the device, must be obeyed.

If you have any questions, please contact our technical support ⇒ [12.1 Technical support Flow Computers and Gas analyzers](#) (p. 290)

## Document History

Revision	Release Date	Description
a to j	June 21, 2016 to Autumn 2018	for software versions 03-03-B to 03-08 A Test and pre-series devices 1st version (ATEX and FM) for worldwide use; extension of I/O configuration and service calibration Adjustments to the grounding concept and pressure ranges.
K	Nov 19, 2019	New translation and title to use from version. 3-34-A/enSuite 4.5.1 Change to use a concept, the appearance of displays, new document format Extension explanation of explosion protection Additional Software security hints New contents of CE declaration
L	(Nov 19, 2019 )	The german version L is identical with the english Version K to synchronize ther is no English version L next Version is M for both languages and possible other translations
M	Aug 11, 2020	Software / Hardware statuses included in documentation / Update control and data security introduced / Remote control panel no longer accessible via http / Updates for connection to device, parameterization and software configuration
N	Feb 08, 2023	Corrections and extensions / Change of appearance / New chapter layout / Standardization of Honeywell documentation, warnings and notes are aligned with ansi-z535.6 and ISO respectively instead of the GHS symbols (red square)
O	Nov 24, 2023	Corrections / update to enSuite version 4.9.4 / extension to include UKCA approval

## 1.2 Important notes to this document

Only the device and software versions specified on the cover sheet are considered in these instructions. **If supplied with the device, this information also applies to the device.** This document is also available online in PDF format for the duration of its validity and can be downloaded under:

<https://docuthek.kromschroeder.com/documents>.



If you have obtained this documentation in PDF format, e.g. after an update, you can use the SHA-1 checksum information to test the file integrity.

The SHA-1 information can be found in the comment field of the Docuthek or in brackets on the Elster-Instromet page.

The device series and documentation are subject to change during further development, and are usually associated with a software update ⇔ [8.1.4 Update Downgrade and Bugfix-Software](#) (p. 186). The above link then provides the successor version.

Honeywell recommends that all technical documentation is always kept to hand in the system. For a comprehensive overall understanding of the measuring system, it is essential to read the manual before starting work!

Essentially the same symbols are used both on the device and in the documents to ensure clarity.

Text preceded by a subsequent symbol must be observed.

Symbol	Meaning Signification
	<p>This symbol indicates dangers and safety instructions that are very important. Texts marked in this way must be followed under all circumstances. <i>Ce symbole indique des dangers et des consignes de sécurité très importantes. Les textes ainsi marqués doivent être respectés en toutes circonstances.</i></p> <p>DANGER! indicates an immediately dangerous situation. <i>DANGER! indique une situation dangereuse imminente</i></p> <p>WARNING! and CAUTION! indicate a possibly dangerous situation. <i>AVERTISSEMENT! et ATTENTION ! indiquer une situation potentiellement dangereuse</i></p> <p>In case of disregard or if the corresponding precautionary measures are not taken, there is a risk of damage to health, environmental damage, damage to property and injuries or even death. <i>Ne pas le faire ou prendre les mesures de précaution appropriées peut entraîner des dommages pour la santé, des blessures ou même la mort</i></p>
	<p>This symbol warns of action errors when handling the device. <i>Ce symbole avertit d'actions incorrectes lors de la manipulation de l'appareil.</i></p> <p>PROHIBITION! indicates actions that you are not allowed to perform, unless the specified conditions and prerequisites are met, and you are qualified for the corresponding work. <i>INTERDICTION! indique des actions que vous n'êtes pas autorisé à effectuer, à moins que les termes et conditions énoncés ne soient respectés et que vous soyez qualifié pour effectuer le travail.</i></p>

Symbol	Meaning Signification
	<p>This symbol warns against damage and misuse of the device. <i>Ce symbole met en garde contre les dommages et la mauvaise utilisation de l'appareil.</i></p> <p>NOTICE! indicates a potentially hazardous situation which may result in property damage and consequential can lead. <i>AVIS! indique une situation potentiellement dangereuse qui peut entraîner des dommages matériels et entraîner des conséquences.</i></p> <p>Certain conditions must be met or a certain behavior is required to avoid this. <i>Certaines conditions doivent être remplies ou certains comportements sont nécessaires pour éviter cela.</i></p>
	<p>This symbol indicates tips and recommendations. These are notes and information to facilitate work with the device. <i>Ce symbole indique des conseils et des recommandations. Ce sont des notes et des informations pour faciliter le travail avec l'appareil.</i></p>
	<p>The symbol on the device is a reminder to comply with all the instructions and important information here in this document. The appropriate parts are marked with the other symbols in this table. <i>Le symbole figurant sur l'appareil rappelle que toutes les indications et informations importantes contenues dans le manuel d'utilisation (dans ce document) doivent être respectées. Les endroits correspondants sont signalés par les autres symboles de ce tableau.</i></p>
	<p>The symbol on the device denotes the connection for the functional earth (FE). <i>Le symbole sur l'appareil désigne le raccord pour la terre fonctionnelle (FE).</i></p>
	<p>The engraved symbol with the description GROUND means that this is the equipotential bond connection point (PA) for the electrical connection to the equipotential bonding system and ground. <i>Le symbole gravé portant la description GROUND signifie qu'ici la borne de compensation de potentiel (PA) est prévue pour le raccordement électrique au système de compensation de potentiel et à la terre.</i></p>
	<p>This information on the device means that the power supply is 24 V DC. <i>Le symbole et/ou l'information sur l'appareil signifient que ce dernier fonctionne avec une tension d'alimentation électrique de 24 volts en courant continu.</i></p>
	<p>In the interest of our environment, it is not permitted to dispose of the device with household waste within the EU! The symbol is a reminder. in accordance with the European WEEE directive. <i>Dans l'intérêt de notre environnement, il n'est pas permis de jeter l'appareil avec les déchets ménagers au sein de l'UE ! Le symbole est un rappel, conformément à la directive européenne DEEE.</i></p>

**NOTICE AVIS****Warning signs or warnings incomplete*****Signes d'avertissement ou avertissements incomplets***

General safety regulations and expert knowledge concerning the behavior in plants and the handling of gas are considered to be known and are therefore not completely reproduced. A lack of warning signs or information does not release you from your personal responsibility for safety!

*Les règles générales de sécurité et les connaissances des experts concernant le comportement dans les usines et la manipulation du gaz sont considérées comme connues et ne sont donc pas reproduites intégralement. L'absence de panneaux d'avertissement ou d'informations ne vous dégage pas de votre responsabilité personnelle en matière de sécurité !*

The figures serve to show the explained facts. They may differ slightly from the actual design.

The definitions and terms used are largely known in the field of gas industry / process measurement technology. The glossary at the end of the manual provides an additional overview.

**For a better distinction between gas and electrical lines in this documentation always the term "cable" is used for electrical lines.**



To gain knowledge in the various fields, e.g. installation, operation and maintenance, it is sufficient to read the relevant section after the safety instructions. The relevant passages can be found quickly using the table of contents or the keyword index.

## 1.2.1 Abbreviations

Short form	Description
°C	Temperature (Celsius) = $T_C = T_K - 273,15 = \frac{5}{9} (T_F - 32)$
°F	Temperature (Fahrenheit) = $T_F = 1,8 T_C + 32 = 1,8 T_K - 459,67$
AFB	Application function block (enSuite)
AMR	Advanced meter reading
ATEX	Atmosphère explosible (French for explosive atmospheres)
AWG	American Wire Gauge
bar	Pressure (Europ. unit) 1 bar = 0.1 MPa = 14.504 psi
BTU	British thermal unit 1 BTU = 0.0010543503 MJ
C <sub>10</sub> H <sub>22</sub>	Total decane
C <sub>2</sub> <sup>+</sup>	Results summary (ethane + all higher hydrocarbons)
C <sub>2</sub> H <sub>6</sub>	Ethane
C <sub>3</sub> H <sub>8</sub>	Propane
C <sub>6</sub> H <sub>14</sub>	Hexane
C <sub>7</sub> H <sub>16</sub>	Total heptane
C <sub>8</sub> H <sub>18</sub>	Total octane
C <sub>9</sub> H <sub>20</sub>	Total nonane
CAL	Calibration gas inlet
CEC	Canadian Electrical Code
CH	Total of all hydrocarbons
CH <sub>4</sub>	Methane
cm	Length 1 cm = 10 mm = 0.3937 in = 0.3937"
CO <sub>2</sub>	Carbon dioxide
CPU	Central processing unit
CSA	Canadian Standards Association
CVDD	Calorific value determining device
d / rd	Relative density (density ratio of fuel and air)
DBB	Double block-and-bleed (valve block technology)
DC	Direct current
DHCP	Dynamic Host Configuration Protocol (Network setting)
DIN	Deutsches Institut für Normung e. V. (German Institute for Standardization)
DNS	Domain Name System (Network setting)
DST	daylight saving time
EMC / EMV	Electromagnetic compatibility (germ. term EMC)
EN	European standard

Short form	Description
EN/IEC 60079-14	Standard on explosive atmospheres
F	Farad = 1/ Daraf = S-1 (electrotechnical units)
FE	Functional earth / functional ground
ftlb / ftlb	Pound-foot 1 ftlb = 1 ftlb = 1.355817948 Nm
GC	Gas chromatograph
GF	Gas family
gr	Grains 1gr = 64.79891 mg
Hi/HiM/HiV	Net heating value / Lower heating value / Inferior calorific value (molar / based on mass / based on volume)
Hs/HsM/HsV	Gross heating value / Higher heating value / Superior calorific value (molar / based on mass / based on volume)
Hz	Frequency
iC <sub>4</sub> H <sub>10</sub>	Isobutane (i-butane)
iC <sub>5</sub> H <sub>12</sub>	Isopentane (i-pentane)
ID	Identification number (enSuite), e.g. gas cylinder number
IECEX:	(IECEX SYSTEM) International explosion-protection (Ex) rating
in or "	length in inch (1 ") 1 in = 1 " = 0.0254 m = 25.4 mm
IP	Internet protocol / Protection class
IR	Infrared
ISO	International Organization for Standardization
K	Temperature (Kelvin) = T <sub>K</sub> = 5/9 (T <sub>F</sub> + 459.67) = T <sub>C</sub> + 273.15 (Δ 1K = Δ 1°C)
KFM Live	Internal coefficients and filters
kg	Kilogram 1kg = 2.204623lb.
l	Liter 1l = 0.001m <sup>3</sup> = 0.0353 cft= 0.0353 cu ft
lb	Pound 1lb = 0.4535923kg
LED	Light emitting diode
log	Logbook
LOD (LDL)	Limit of detection, or lower detection limit
LOQ	Limit of quantitation
m	Mass
M (Mm)	Molar mass (of the mixture)
m or mm	Length in SI unit (meter) 1 m = 1000 mm = 3.280840 ft = 39.37008 in (or ")
m <sup>3</sup>	Cubic meter 1m <sup>3</sup> = 1000 l = 35.3147 cft = 35.3147 cu ft
MEMS	Micro-electro-mechanical system
mg	Milligram 1 mg = 0.0154323584 gr
MJ	Megajoule 1MJ = 948.45138280892 BTU
MMS	Manufacturing Messaging Specification

Short form	Description
MPa	Megapascal (pressure) 1 MPa = 10 bar = 145.04 psi
MPag	Gauge pressure in megapascals
MZ (MN)	Methane number
N	Newton Force (SI unit ) 1N=1kg· m· s <sup>-2</sup> = 0.224809 lbf
N <sub>2</sub>	Nitrogen (gas component)
NC	Switch/output which is closed when de-energized (NC contact)
nC <sub>4</sub> H <sub>10</sub>	n-butane
nC <sub>5</sub> H <sub>12</sub>	n-pentane
nC <sub>6</sub> H <sub>14</sub>	n-hexane (C <sub>6</sub> +)
NEC	National Electrical Code (USA)
neo-C <sub>5</sub> H <sub>12</sub>	Neopentane (2,2-Dimethylpropane)
NIST	US National Institute of Standards and Technology
Nm	Torque 1 Nm = 0.7375621494575465 ft lb
NO	Switch/output which is open when de-energized (NO contact)
NPT	National Pipe Thread (self-sealing (pipe) thread)
NTP	Network Time Protocol (Standard for clock synchronization in computers)
O <sub>2</sub>	Oxygen
PA	Equipotential bonding connection
PC	Personal computer
PELV	Protective extra-low voltage
PG	Process gas/Measuring gas
PGC	Process gas chromatograph
PI	Internal pressure (internal monitoring)
ppm	Parts per million
Pressure (g)	Overpressure (g = gauge)
psi	Pressure (pound per square inch) 1psi = 0.068948 bar = 0.0068948 MPa
PU	Ambient pressure (internal monitoring)
PW1/PW2	Internal calculations
Rho	Density at base conditions
RS485	Interface standard for cable-based differential serial data transfer
S	Daraf = 1/ Farad = F-1
SAV	Safety shut-off valve
SELV	Safety extra-low voltage
SFB	System function block (enSuite)
sft <sup>3</sup> /scft	Standard cubic foot 1cft = 0.028317 m <sup>3</sup> = 28.317 l
SI	International unit system (Le Système International d'Unités)
SLC	Single level calibration (Calibration automatic or by user)

Short form	Description
SSW	Security switch
TB1/TB2	Internal calculations
TCD	Thermal conductivity detector
TCP	Transmission Control Protocol (Internet)
TH1	Housing temperature
TLS	Transport Layer Security transmission protocol
TM1/TM2	Internal calculations
TP	Circuit board temperature (internal monitoring)
TSB	Temperature of sensor block
VDE	German Association for Electrical, Electronic & Information Technologies
VPN	Virtual Private Network
WEEE	Waste of Electrical and Electronic Equipment (EU directive)
Wi	Inferior Wobbe index / Net Wobbe index
Ws	Wobbe index superior / Gross Wobbe index
YOC	Year of construction
Z	Compressibility factor
$\rho$ (Rho)	Density at base conditions

## 2 Safety information (EN-US-FRA)

**//Cette page est répétée en français. // This page is repeated in French. //**

The device complies with the relevant safety standards. The safety and warning notes listed here and on the device (in English or France) support proper handling.

Always observe all safety information in this manual and on the device. Also observe the technical specifications or the data sheet. Always contact Honeywell if you have any questions or are in doubt!



### PROHIBITION

- to operate the measuring device or parts involved in the measurement with damages
- operation with modified housing or unsuitable connections.
- Installation in a place where electrostatic charges may occur on non-conductive surfaces.
- storage and operation at ambient conditions /temperatures outside the temperature range specified on the device / data sheet.
- Use in corrosive atmospheres and in potentially explosive atmospheres not specified in the approvals

**The explosion protection is no longer given in these cases.**

If it is found that the measuring equipment or other parts involved in the measurement are damaged, the system must be put out of operation, disconnect everything from the gas and electricity supplies and secure the parts to prevent them being used accidentally.



### NOTICE

#### Changes or modifications to the device

In case of unauthorized modifications, the CE declaration loses its validity with immediate effect! A safety risk may arise!

Deviations from these specifications may only be made with the approval of Honeywell. If the device is at the limits of its operating temperature range, consider:



### CAUTION

#### Hot or cold surfaces

Contact can cause burns and frostbite!

In case of doubt, the device should be operated via the remote operation panel.

### Repeat "Safety information" in French Répétition "Informations de sécurité" en français

L'appareil est conforme aux normes de sécurité en vigueur. Les consignes de sécurité et d'avertissement énumérées ici et sur l'appareil (en anglais ou en français) permettent une manipulation correcte.

Respectez toujours toutes les consignes de sécurité figurant dans ce manuel et sur l'appareil. Respectez également les spécifications techniques ou la fiche technique. En cas de questions ou de doutes, contactez toujours Honeywell !



#### INTERDICTION

- de faire fonctionner l'appareil de mesure ou les pièces impliquées dans la mesure avec des dommages
- fonctionnement avec un boîtier modifié ou des connexions inadaptées.
- Installation dans un endroit où des charges électrostatiques peuvent se produire sur des surfaces non conductrices.
- stockage et fonctionnement dans des conditions ambiantes/températures en dehors de la plage de température spécifiée sur l'appareil/la fiche technique.
- Utilisation dans des atmosphères corrosives et dans des atmosphères potentiellement explosives non spécifiées dans les homologations.

**La protection contre les explosions n'est plus assurée dans ces cas.**

S'il s'avère que l'équipement de mesure ou d'autres pièces impliquées dans la mesure sont endommagés, le système doit être mis hors service, tout déconnecter des alimentations en gaz et en électricité et sécuriser les pièces pour éviter qu'elles ne soient utilisées accidentellement.



#### AVIS Changements ou modifications de l'appareil

En cas de modifications non autorisées, la déclaration CE perd sa validité avec effet immédiat ! Un risque pour la sécurité peut survenir !

Les déviations de ces spécifications ne peuvent être faites qu'avec l'approbation de Honeywell. Si l'appareil se trouve aux limites de sa plage de température de fonctionnement, envisagez :



#### ATTENTION Surfaces chaudes ou froides

Tout contact peut provoquer des brûlures et des gelures !

En cas de doute, l'appareil doit être commandé via le panneau de commande à distance.

## 2.1 Intended use

**//Cette page est répétée en français. // This page is repeated in French. //**

The intended use of this instrument is the gas analysis of natural gas or natural gas-like gas (all components gaseous). For this purpose, all information on the measuring device, its data sheet and in this manual must be observed, as well as the information on installation and maintenance. Handling the equipment requires the personnel to be able to recognize hazards and risks as well as to assess their own work. Particular attention must be paid to:

- Installation only allowed in measuring systems where access control is guaranteed, i.e. where protective measures are taken to prevent unauthorized persons from gaining physical access to the device. Radio interference is possible (device is class A equipment). It may be required, to carry out appropriate interference suppression measures.
- It must be ensured, e.g. by means of high-pressure reductions and safety devices, that maximum permissible device pressures are not exceeded in the installation, even in the event of a fault. The device and any connected vent line must always be in a safe condition. Inspection and maintenance work must be carried out properly.
- It must be ensured that no hazards like electric shock, earth potential shift or lightning strikes exist or can arise, for example by means of an appropriate electrical installation and lightning conductor.

Deviations from these specifications and the following information in this manual are considered **misuse**.



### DANGER / WARNING OF MISUSE

Dangerous situations can arise!  
Gas can escape and cause consequential damage.

The device protection can be impaired in the event of misuse - only use the device for its intended purpose in accordance with safety- and explosion-protection-rules !



The list of suitable gases and calibration gases can be found in the technical data and in the data sheet of the device. ⇒ [11.3 List of suitable gases and calibration gases](#) (p. 285). For other gases, be sure to contact Honeywell before use.

If you want to use the device together with devices from other manufacturers or third-party equipment, make sure that they are suitable components.

The corresponding components must have their own operating instructions which provide information on their suitability for joint operation.

### Repeat "Intended use" in French Répétition "Utilisation prévue" en français

L'utilisation prévue de cet instrument est l'analyse du gaz naturel ou du gaz de type gaz naturel (tous les composants gazeux). À cette fin, toutes les informations sur l'appareil de mesure, sa fiche technique et dans ce manuel doivent être respectées, ainsi que les informations sur l'installation et la maintenance. La manipulation de l'appareil exige que le personnel soit capable de reconnaître les dangers et les risques ainsi que d'évaluer son propre travail. Une attention particulière doit être accordée à :

- Installation uniquement autorisée dans les systèmes de mesure où le contrôle d'accès est garanti, c'est-à-dire où des mesures de protection sont prises pour empêcher les personnes non autorisées d'accéder physiquement à l'appareil. Des interférences radio sont possibles (l'appareil est un équipement de classe A). Il peut être nécessaire de prendre des mesures appropriées de suppression des interférences.
- Il faut s'assurer, par exemple au moyen de réductions de haute pression et de dispositifs de sécurité, que les pressions maximales admissibles de l'appareil ne sont pas dépassées dans l'installation, même en cas de défaut. L'appareil et la conduite d'évacuation éventuellement raccordée doivent toujours être dans un état sûr. Les travaux d'inspection et de maintenance doivent être effectués correctement.
- Il faut s'assurer qu'aucun danger tel qu'un choc électrique, un déplacement du potentiel de terre ou un coup de foudre n'existe ou ne peut survenir, par exemple au moyen d'une installation électrique et d'un paratonnerre appropriés.

Tout écart par rapport à ces spécifications et aux informations suivantes de ce manuel est considéré comme **une mauvaise utilisation**.



#### DANGER / AVERTISSEMENT D'UNE MAUVAISE UTILISATION

Des situations dangereuses peuvent survenir !

Du gaz peut s'échapper et provoquer des dommages consécutifs. La protection de l'appareil peut être compromise en cas de mauvaise utilisation - n'utilisez l'appareil que pour l'usage auquel il est destiné, conformément aux règles de sécurité et de protection contre les explosions !



La liste des gaz appropriés et des gaz d'étalonnage se trouve dans les données techniques et dans la fiche technique de l'appareil.

⇒ [11.3 List of suitable gases and calibration gases \(p. 285\)](#). Pour les autres gaz, veuillez à contacter Honeywell avant toute utilisation.

Si vous souhaitez utiliser l'appareil avec des appareils d'autres fabricants ou des équipements tiers, assurez-vous qu'il s'agit de composants adaptés.

Les composants correspondants doivent avoir leur propre mode d'emploi qui fournit des informations.

## 2.1.1 Specific condition of use



### DANGER

#### Faulty handling repair or maintenance of the device.

Damage to health and property (explosion) possible.

Flameproof joints:

Dimensions of the flameproof joints are detailed in the manufacturer's design documents. Contact the manufacturer for repair work.

Cable and entry devices:

Cables, glands, adapters and blanking plugs shall be suitable for + 80°C  $\triangleq$  176°F.

Painted models:

The housing may only be cleaned with a moist cloth because of potential electrostatic charging.

Also note the information under [↔ 2.6 Handling explosion-protection devices](#) (p. 30)

### Repeat "Specific condition of use " in French Répétition "Condition spécifique d'utilisation" en français



### DANGER

#### Manipulation défectueuse, réparation ou entretien de l'appareil.

Risque de dommages à la santé et aux biens (explosion).

Arrête-flammes joints:

Les dimensions des joints arrête-flammes sont détaillées dans les documents de conception du fabricant. Contactez le fabricant pour les travaux de réparation.

Câbles et dispositifs d'entrée :

Les câbles, les presse-étoupes, les adaptateur, et les bouchons obturateurs doivent convenir pour + 80°C  $\triangleq$  176°F.

Modèles peints:

Le boîtier ne peut être nettoyé qu'avec un chiffon humide en raison du risque de charge électrostatique.

Consultez également les informations sous [↔ 2.6 Handling explosion-protection devices](#) (p. 30)

## 2.2 Place of use environmental conditions and installation

//Cette page est répétée en français. // This page is repeated in French. //



### **DANGER Place of use unsuitable**

Danger of explosion Risk of extraneous effects

The device may only be installed and used in the potentially dangerous zones specified on it. Access to the device by unauthorized persons must not be possible. Use in a potentially corrosive area only after consultation and approval by Honeywell.



### **DANGER Improper assembly and installation**

Explosion hazard

The regulations in the relevant national and international standards (for example, IEC/EN 60079-14, installation of explosion-protection equipment) must be followed to the letter. Lightning protection is required.

There must not be any ground potential difference between the components of the measuring system distributed in the plant - this must be prevented, e.g. by a properly dimensioned equipotential bonding conductor.

The device housing and mounting base must be included in the grounding system or equipotential bonding system. The grounding connection (GROUND) on the device (together with other connections if necessary) must be used for this purpose.



### **NOTICE Extreme ambient temperatures**

Damage to device and system, incorrect measurement results.

It must be ensured (e.g. by means of an air-conditioned housing) that the device is not exposed to inadmissible temperatures. Temperature range (-25°C  $\triangleq$  -13°F  $\triangleq$  248 K to +55°C  $\triangleq$  +131°F  $\triangleq$  328 K).



### **PROHIBITION**

- **Expose the device to direct weather influences (sun, wind, water) without protection.**

Make sure that the device cannot be hit by a water jet (e.g. when cleaning the plant). Outdoors, protect the device from direct sunlight and rain, e.g. with a tin roof. In a windy environment with temperatures below freezing, a wind-break may be required.

**Repeat "Place of use environmental conditions and installation" in French**  
**Répétition "Lieu d'utilisation, conditions environnementales et installation" en français**



**DANGER Lieu d'utilisation inadapté (Explosion/effet étranger)**

L'appareil ne doit être installé et utilisé que dans les zones potentiellement dangereuses indiquées sur celui-ci. L'accès au dispositif par des personnes non autorisées ne doit pas être possible. L'utilisation dans une zone potentiellement corrosive ne doit se faire qu'après consultation et approbation par Honeywell.



**DANGER Montage et installation incorrects (Risque d'explosion)**

Les prescriptions des normes nationales et internationales en vigueur (par exemple, CEI/EN 60079-14, installation d'équipements antidéflagrants) doivent être respectées à la lettre. Une protection contre la foudre est nécessaire. Il ne doit pas y avoir de différence de potentiel de terre entre les composants du système de mesure répartis dans l'installation - cela doit être empêché, par exemple par un conducteur d'équipotentialité correctement dimensionné.

Le boîtier de l'appareil et le socle de montage doivent être inclus dans le système de mise à la terre ou dans le système de liaison équipotentielle. La connexion de mise à la terre (GROUND) sur l'appareil (ainsi que d'autres connexions si nécessaire) doit être utilisée à cette fin.



**AVIS Températures ambiantes extrêmes**

Endommagement de l'appareil et du système, résultats de mesure erronés.

Il faut veiller (par exemple au moyen d'un boîtier climatisé) à ce que l'appareil ne soit pas exposé à des températures inadmissibles. Plage de température (-25°C  $\triangleq$  -13°F  $\triangleq$  248 K to +55°C  $\triangleq$  +131°F  $\triangleq$  328 K).



**INTERDICTION!**

- **Exposer l'appareil aux influences directes des intempéries (soleil, vent, eau) sans protection.**

Veillez à ce que l'appareil ne puisse pas être touché par un jet d'eau (par exemple, lors du nettoyage de l'installation). À l'extérieur, protégez l'appareil des rayons directs du soleil et de la pluie, par exemple avec un toit en tôle. Dans un environnement venteux avec des températures inférieures à zéro, un brise-vent peut être nécessaire.

## 2.3 Required knowledge of the personnel

**//Cette page est répétée en français. // This page is repeated in French. //**

Assembly, electrical installation, commissioning and decommissioning as well as inspection and maintenance work may only be carried out by qualified personnel.

The ability to recognize dangers and risks, to assess their own work and to avoid possible hazards must be absolutely present in the personnel employed.

Reference is made to the relevant technical regulations, e.g. Directive RL 99/92/EC (ATEX 137). Do not deviate from this rule in the area of application.

The qualified specialists must have expertise according to EN-IEC 60079-14 Annex A or have comparable knowledge below:

- General safety rules
- Care and use of appropriate safety equipment
- Regulations for electrical safety technology and explosion protection
- Work on electrical circuits for hazardous (explosive) areas
- Working with high pressures and aggressive and dangerous media
- Safety instructions and Warnings in this document



### PROHIBITION

- Handling of the device by persons whose ability to react is influenced, e.g. by drugs, alcohol or medication.

**Repeat "Required knowledge of the personnel" in French**  
**Répétition "Connaissances requises du personnel" en français**

Le montage, l'installation électrique, la mise en service et la mise hors service ainsi que les travaux d'inspection et de maintenance ne peuvent être effectués que par du personnel qualifié.

La capacité à reconnaître les dangers et les risques, à évaluer son propre travail et à éviter les dangers éventuels doit être absolument présente chez le personnel employé.

Il est fait référence aux règlements techniques pertinents, par exemple la directive RL 99/92/CE (ATEX 137). Ne pas s'écarter de cette règle dans le domaine d'application.

Les spécialistes qualifiés doivent disposer d'une expertise selon la norme EN-IEC 60079-14 Annexe A ou avoir des connaissances comparables ci-dessous :

- Règles générales de sécurité.
- Maintenance et utilisation d'équipements de sécurité raisonnables.
- Règles de sécurité électrique et de protection contre les explosions.
- Travail sur les circuits électriques pour les systèmes à atmosphères explosibles.
- Travail avec des pressions élevées et des fluides agressifs ou dangereux.
- Informations relatives à la sécurité et aux avertissements figurant dans ce document.



**INTERDICTION!**

- *Manipulation de l'appareil par des personnes dont la capacité de réaction est influencée, par exemple par des drogues, de l'alcool ou des médicaments.*

## 2.4 Information and warnings on the device

//Cette page est répétée en français. // This page is repeated in French. //

**All information on the device must be noted and obeyed in all circumstances!**

Safety instructions and warnings are given in English or French.



### NOTICE

#### Language skills necessary

Language skills for understanding the safety and warning instructions and their meaning must be available!

The information is engraved on the device or noted on the main type plate or additional type plates and labels. See following example.

**WARNING:**  
DISCONNECT POWER BEFORE OPENING.  
DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE  
IS PRESENT.  
IF CONDUITS ARE USED, SEAL THEM WITHIN 18 INCHES.  
USE CABLES AND CABLE ENTRIES SUITABLE FOR 10°C  
ABOVE MAXIMUM AMBIENT.  
**ATTENTION:**  
DÉBRANCHER LA ÉNERGIE AVANT OUVERTURE.  
NE PAS OUVRIR SI UNE EXPLOSIVE GAZ ATMOSPHERE  
EST PRÉSENT:  
SI CONDUITES SONT UTILISES, SCELLER MOINS DE  
18 POUNCES.  
UTILISER DES ENTRÉES DE CÂBELS RECOMMANDÉES  
POUR 10°C AU-DESSUS DE LA TEMPÉRATURE AMBIANT  
MAXIMUM.

Fig. 2-1: Example warning and information on the housing

**Repeat "Information and warnings on the device" in French**  
**Répétition "Informations et avertissements sur l'appareil" en français**

**Toutes les informations figurant sur l'appareil doivent être prises en compte et respectées en toutes circonstances**

Les consignes de sécurité et les avertissements sont donnés en anglais ou en français.



**AVIS**

***Compétences linguistiques nécessaires***

Les compétences linguistiques permettant de comprendre les consignes de sécurité et les avertissements et leur signification doivent être disponibles !

Les informations sont gravées sur l'appareil ou notées sur la plaque signalétique principale ou les plaques signalétiques et étiquettes supplémentaires. Voir l'exemple suivant.

**WARNING:**  
DISCONNECT POWER BEFORE OPENING.  
DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE IS PRESENT.  
IF CONDUITS ARE USED, SEAL THEM WITHIN 18 INCHES.  
USE CABLES AND CABLE ENTRIES SUITABLE FOR 10°C ABOVE MAXIMUM AMBIENT.  
**ATTENTION:**  
DÉBRANCHER LA ÉNERGIE AVANT OUVERTURE.  
NE PAS OUVRIR SI UNE EXPLOSIVE GAZ ATMOSPHERE EST PRÉSENT:  
SI CONDUITES SONT UTILISES, SCELLER MOINS DE 18 POUNCES.  
UTILISER DES ENTRÉES DE CÂBELS RECOMMANDÉES POUR 10°C AU-DESSUS DE LA TEMPÉRATURE AMBIANT MAXIMUM.

Fig. 2-2: Exemple d'avertissement et d'information sur le boîtier

## 2.5 Safety information about gases and pressures

**//Cette page est répétée en français. // This page is repeated in French. //**

The measurement device requires various gases for operation and measurement with different hazard potentials. Supply all gases into the device and out again via fixed lines. Follow the hints in section ⇒ [5.4 Fluidic installation of the measuring device](#) (p. 66)



### DANGER

#### Explosion and poisoning

Gases can form an explosive mixture with air and be toxic. Damage to health to property and to environment can be the consequences of incorrect handling. Always ensure adequate ventilation when working on gas lines and protect against gases containing aggressive or toxic components. Observe the explosion protection regulations.



### PROHIBITION

- Connect gases which are potentially flammable or explosive without the presence of oxygen (for example, C<sub>2</sub>H<sub>2</sub> acetylene) to the device.
- supply the device with any gas which contains an amount of oxygen that could lead into a flammable or explosive mixture.
- pressure above 0.3 MPag  $\triangleq$  3 barg  $\triangleq$  43.51psig at the input ports (even in the event of a fault)
- excess pressure at the outlet ports (also in case of error)

**Repeat "Safety information about gases and pressures" in French****Répétition "Informations de sécurité concernant les gaz et les pressions" en français**

L'appareil de mesure a besoin de divers gaz pour fonctionner et mesurer, avec des potentiels de danger différents. Tous les gaz doivent être introduits dans l'appareil et ressortir par des conduites fixes.

Suivez les conseils de la section ⇨ [5.4 Fluidic installation of the measuring device](#) (p. 66)

**DANGER*****Explosion et empoisonnement***

Les gaz peuvent former un mélange explosif avec l'air et être toxiques. Des dommages à la santé, aux biens et à l'environnement peuvent être les conséquences d'une manipulation incorrecte. Veillez toujours à une ventilation suffisante lorsque vous travaillez sur des conduites de gaz et protégez-vous contre les gaz contenant des composants agressifs ou toxiques. Respectez les règles de protection contre les explosions.

**INTERDICTION**

- De raccorder à l'appareil des gaz qui sont potentiellement inflammables ou explosifs sans la présence d'oxygène (par exemple, l'acétylène C<sub>2</sub>H<sub>2</sub>).
- Alimenter l'appareil avec tout gaz contenant une quantité d'oxygène pouvant conduire à un mélange inflammable ou explosif.
- Pression supérieure à 0.3 MPag  $\triangleq$  3 barg  $\triangleq$  43.51psig aux orifices d'entrée (même en cas de défaut).
- La surpression aux orifices de sortie (également en cas d'erreur).

## 2.6 Handling explosion-protection devices

//Cette page est répétée en français. // This page is repeated in French. //



### DANGER

**Faulty handling repair or maintenance of the device.**

Damage to health and property (explosion) possible

**DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT**

Before the device is switched on or switched back on, it must be ensured that all the gas connections are sealed and the grounding or protective conductor is correctly installed.

All covers, lids and hoods, which can be unscrewed to open the housing, must be protected against accidental opening by safety screws.

Contact the manufacturer for repair work which affects the explosion protection.

Maintenance must be carried out regularly according to the instructions in this manual.

Also note the information under ⇨ [2.1.1 Specific condition of use](#) (p. 21)

Explosion-proof devices or housings are equipped with an element that serves to equalize pressure. If this breather called element has to be replaced, this may only be done by authorized personnel.

The breather is not part of the vent (waste) gas system and is in direct contact with the ambient atmosphere. It must not be closed or blocked. No gas escapes during normal operation.

Gas will only escape from the breather in the event of an error. If necessary take suitable precautions to discharge it. For example, for installations in a building, this may take the form of a line into a safe ventilation area or appropriate ventilation of the installation site.

The completely separate line can be connected via the internal thread of the breather (1/4 " NPT). The following specifications must be observed for this line:

- The additional pressure drop which may be caused by the pipeline depends on fittings, bends and the material used. It must not allow the pressure inside the housing to rise above 10 kPa  $\approx$  1.45psi  $\approx$  100 mbar. If a straight smooth pipe is used with a minimum internal diameter of 8 mm  $\approx$  0.31496 inch and a suitable inlet pressure, lengths of around 40m  $\approx$  131ft are possible. If you wish to deviate from this specifications or in case of doubt, contact Honeywell.

**Repeat "Handling explosion-protection devices" in French**  
**Répétition "Manipulation des appareils de protection contre les explosions" en français**

**DANGER****Manipulation défectueuse, réparation ou entretien de l'appareil.**

Risque de dommages à la santé et aux biens (explosion).

**NE PAS OUVRIR EN PRÉSENCE D'UNE ATMOSPHÈRE EXPLOSIVE**

Avant la mise en marche ou la remise en marche de l'appareil, il faut s'assurer que tous les raccords de gaz sont étanches et que le conducteur de mise à la terre ou de protection est correctement installé.

Tous les couvercles et capots, qui peuvent être dévissés pour ouvrir le boîtier, doivent être protégés contre toute ouverture accidentelle par des vis de sécurité.

Contactez le fabricant pour les travaux de réparation qui affectent la protection contre les explosions.

L'entretien doit être effectué régulièrement selon les instructions de ce manuel.

Consultez également les informations sous [↔ 2.1.1 Specific condition of use](#) (p. 21)

Les appareils ou boîtiers antidéflagrants sont équipés d'un élément qui sert à égaliser la pression. Si cet élément appelé reniflard doit être remplacé, cela ne peut être fait que par du personnel autorisé.

Le reniflard ne fait pas partie du système d'évacuation des gaz (déchets) et est en contact direct avec l'atmosphère ambiante. Il ne doit pas être fermé ou bloqué. Aucun gaz ne s'échappe pendant le fonctionnement normal.

Le gaz ne s'échappera du reniflard qu'en cas d'erreur. Si nécessaire, prenez les précautions nécessaires pour l'évacuer. Par exemple, pour les installations dans un bâtiment, cela peut prendre la forme d'une conduite vers une zone de ventilation sûre ou d'une ventilation appropriée du site d'installation.

La conduite complètement séparée peut être raccordée via le filetage interne du reniflard (1/4 " NPT). Les spécifications suivantes doivent être respectées pour cette ligne :

- La perte de charge supplémentaire qui peut être provoquée par la canalisation dépend des raccords, des coudes et du matériau utilisé. Elle ne doit pas permettre à la pression à l'intérieur du boîtier de dépasser 10 kPa  $\pm$  1,45psi  $\pm$  100 mbar. Si l'on utilise un tuyau lisse et droit d'un diamètre interne minimum de 8 mm  $\pm$  0,31496 pouce et une pression d'entrée appropriée, des longueurs d'environ 40m  $\pm$  131ft sont possibles. Si vous souhaitez vous écarter de ces spécifications ou en cas de doute, contactez Honeywell.

**//Cette page est répétée en français. // This page is repeated in French. //**

The breather and the opening of the connected line, if used, must be protected by the operator against dirt, insects and rain, e.g. by a stainless steel insect screen. Protection against rain can be provided, for example, by having the end of the line point downward like a swan neck. Permanent atmospheric ventilation must be ensured.



#### PROHIBITION

- **Open the housing in the presence of an explosive gas atmosphere.**
- **Loosen the cable entries in the presence of an explosive gas atmosphere**
- **Connect the breather line with other lines**
- **Loosen or unscrew the breather in an explosive atmosphere**
- **Recommissioning procedure in an explosive gas atmosphere**

The operation and maintenance of explosion-proof devices may only be carried out by qualified personnel using explosion-proof, approved work equipment and measuring instruments. Work in potentially explosive atmospheres requires a license. You need a written operator's license (fire service license certificate), for example, for the following:

- Transporting and/or using a PC or laptop through or in a potentially explosive atmosphere.
- Working on the open device when the operating voltage is live.(e.g. needed for test the device)
- Connecting the control and parameterization device or laptop e.g. via USB.

Follow the instructions set out below carefully and ensure that you have completed all the required safety steps before you work on the measuring unit or switch it on again. When you are working on the device, always switch it off before opening it! After opening, the voltage can be switched on again if necessary, with the operator's permission. Observe hints for → [5.5 Opening and closing GasLab Q2](#) (p. 70) and the following sequence:

- Close all gas supplies.
- Switch off the supply voltage.  
(According the note on device: DISCONNECT POWER BEFORE OPENING)  
(Mark your work on the switched-off supply voltage and secure it against being switched on again!)
- Protect all open pipelines and connections from dirt.

**Repeat "Handling explosion-protection devices" in French**  
**Répétition "Manipulation des appareils de protection contre les explosions" en français**

Le reniflard et l'ouverture de la conduite connectée, si elle est utilisée, doivent être protégés par l'opérateur contre la saleté, les insectes et la pluie, par exemple par une moustiquaire en acier inoxydable. Une ventilation atmosphérique permanente doit être assurée.



**INTERDICTION!**

- *Ouvrir le boîtier en présence d'une atmosphère de gaz explosif.*
- **Desserrer les entrées de câbles en présence d'une atmosphère de gaz explosif.**
- **Raccorder la conduite du reniflard à d'autres conduites**
- **Desserrer ou dévisser le reniflard en présence d'une atmosphère explosive.**
- **Procédure de remise en service en présence d'une atmosphère de gaz explosif.**

Le fonctionnement et l'entretien des appareils antidéflagrants ne peuvent être effectués que par du personnel qualifié utilisant des équipements de travail et des instruments de mesure antidéflagrants et homologués. Les travaux dans des atmosphères potentiellement explosives nécessitent une autorisation. Vous avez besoin d'une licence écrite d'opérateur (certificat de licence de service d'incendie), par exemple, pour les activités suivantes :

- Transporter et/ou utiliser un PC ou un ordinateur portable à travers ou dans une atmosphère potentiellement explosive.
- Travailler sur l'appareil ouvert lorsque la tension de service est sous tension (par exemple, pour tester l'appareil).
- Connexion de l'appareil de commande et de paramétrage ou de l'ordinateur portable, par exemple via USB.

Avant de travailler sur l'appareil de mesure ou de le remettre en marche, suivez attentivement les instructions ci-dessous et assurez-vous que vous avez effectué toutes les mesures de sécurité requises. Lorsque vous travaillez sur l'appareil, mettez-le toujours hors tension avant de l'ouvrir ! Après l'ouverture, la tension peut être remise en marche si nécessaire, avec l'autorisation de l'exploitant. Respectez les conseils de ⇨ [5.5 Opening and closing GasLab Q2](#) (p. 70) et la séquence suivante :

- *Fermer toutes les alimentations en gaz.*
- Couper la tension d'alimentation. (Selon la note sur l'appareil : DÉCONNEXION DE L'ALIMENTATION AVANT L'OUVERTURE) (Marquez votre travail sur la tension d'alimentation coupée et protégez-la contre toute remise sous tension).
- Protégez toutes les conduites et tous les raccords ouverts contre la saleté.

## 2.7 Electrical safety information

//Cette page est répétée en français. // This page is repeated in French. //



### CAUTION Health and equipment damage due to installation errors

The installation must comply with the local electrical and explosion protection standards (for example, DIN, EN, VDE, UL, etc.).

Compliance with standards and directives on the following topics is mandatory:

- Electrical equipment for potentially explosive gas atmospheres
- Operation of electrical systems
- Testing / maintaining electrical systems in potentially explosive gas atmospheres
- Erection of power installations with rated voltages below 1000 V – tests – initial tests
- German Ordinance on Industrial Safety and Health

Each device must be operated with its own voltage source. This must be protected externally by a fuse or circuit breaker.

The SELV system or the PELV system may be used. All electrically conductive parts (housing and, if available, mounting constructions) must be included in the earthing or potential equalisation. For this purpose, the potential equalization connection point (PA) of the device housing must be used in any case. Further connections may be required. The equipotential bonding connection point at the bottom of the instrument housing is labeled GROUND.



### CAUTION

#### Health and equipment damage due to unsafe electrical supply

All connected devices have increased insulation against mains voltage. The 24 V DC power supply must have a safe electrical isolation point and be protected by a fuse or circuit breaker.



### PROHIBITION

- Operation without potential equalization / potential equalization line or grounding.
- Operation with earth potential displacement or earth potential difference in the parts of the measuring system e.g. between device and control room.



For details see ⇨ [5.6 Electrical installation](#) (p. 74)

**Repeat "Electrical safety information" in French  
Répétition "Informations sur la sécurité électrique" en français**



**ATTENTION**

**Dommmages à la santé et à l'appareil en raison d'erreurs d'installation**

*L'installation doit être conforme aux normes électriques et de protection contre les explosions locales (par exemple, DIN, EN, VDE, UL, etc.).*

Il est obligatoire de respecter les normes et directives concernant les sujets suivants :

- Équipement électrique pour les atmosphères gazeuses explosibles.
- Fonctionnement des systèmes électriques.
- Essai et maintenance des systèmes électriques dans les atmosphères gazeuses explosibles.
- Montage d'installations électriques de tension nominale inférieure à 1000 V - essais - essais initiaux.
- Ordonnance allemande sur la sécurité et la santé au travail.

*Chaque appareil doit être alimenté par sa propre source de tension. Celle-ci doit être protégée extérieurement par un fusible ou un disjoncteur. Le système SELV ou le système PELV peut être utilisé. Toutes les parties électriquement conductrices (boîtier et, le cas échéant, constructions de montage) doivent être incluses dans la mise à la terre ou la compensation de potentiel. A cet effet, le point de raccordement de la compensation de potentiel (PA) du boîtier de l'appareil doit être utilisé dans tous les cas. Le point de connexion d'équipotentialité au fond du boîtier de l'appareil est marqué GROUND.*



**ATTENTION Dommages à la santé et à l'appareil en raison d'une alimentation électrique non sûre**

*Tous les appareils connectés ont une isolation renforcée contre la tension du secteur. L'alimentation en 24 V CC doit avoir un point d'isolation électrique sûr et être protégée par un fusible ou un disjoncteur.*



**INTERDICTION!**

- **Fonctionnement sans égalisation de potentiel / ligne d'égalisation de potentiel ou mise à la terre.**
- **Fonctionnement avec déplacement du potentiel de terre ou différence de potentiel de terre dans les parties du système de mesure, par exemple entre l'appareil et la salle de contrôle.**



Pour plus de détails, voir ⇨ [5.6 Electrical installation](#) (p. 74)

## 2.7.1 Disconnecting device and cables

**//Cette page est répétée en français. // This page is repeated in French. //**

The device does not have its own off switch and must be operated by the customer via a disconnecting device and current limiting device (or combination of both) to comply with ISO / IEC60079-14 and ISO / IEC61010-1.

An example of such a disconnecting device, which is not included in the scope of supply, is a C 4A circuit breaker, which must be installed near the Q2 for reasons of explosion protection and electrical safety.

The disconnect device must meet the requirements of the installation site, must be capable of safely disconnecting at least 48 V DC, and must disconnect all power supply lines leading into the hazardous area. It thus contributes to the formation of the power-limited circuit.



### DANGER / WARNING / CAUTION

#### Use of wrong equipment Installation errors

Health hazard Explosion hazard

The installation personnel must ensure that the wiring is protected from overloads and short-circuits and has the required over voltage and over current protection.

The supply and communication equipment (cables not supplied) must be screened and comply with local installation regulations.

The cable shall be suitable for + 80°C  $\pm$ 176°F.



### PROHIBITION

- Operation without disconnection device
- Replacement of internal fuses without authorization

Without a disconnect device, the unit no longer complies with ISO / IEC60079-14 and ISO / IEC61010-1. Replacement of internal fuses may only be performed by Honeywell authorized personnel.

**Repeat "Disconnecting device and cables" in French**  
**Répétition "Dispositif d'isolement et câble" en français**

L'appareil ne dispose pas de son propre interrupteur d'arrêt et doit être actionné par le client par le biais d'un dispositif de déconnexion et d'un dispositif de limitation du courant (ou une combinaison des deux) conformes aux normes ISO / IEC60079-14 et ISO / IEC61010-1.

Un exemple d'un tel dispositif de déconnexion, qui n'est pas inclus dans l'étendue de la fourniture, est un disjoncteur C 4A, qui doit être installé à proximité du Q2 proChain GC pour des raisons de protection contre les explosions et de sécurité électrique.

Le dispositif de coupure doit répondre aux exigences du site d'installation, doit être capable de déconnecter en toute sécurité au moins 48 V DC, et doit déconnecter toutes les lignes d'alimentation électrique menant à la zone dangereuse. Il contribue ainsi à la formation du circuit à puissance limitée.



**DANGER / AVERTISSEMENT/ ATTENTION**

**Utilisation d'un mauvais équipement Erreurs d'installation**

Risque pour la santé Risque d'explosion

Le personnel chargé de l'installation doit s'assurer que le câblage est protégé contre les surcharges et les courts-circuits et qu'il dispose de la protection requise contre les surtensions et les surintensités.

Les équipements d'alimentation et de communication (câbles non fournis) doivent être blindés et conformes aux réglementations locales d'installation.

Le câble doit être adapté à + 80°C  $\pm$ 176°F.



**INTERDICTION!**

- **Fonctionnement sans dispositif de déconnexion**
- **Remplacement des fusibles internes sans autorisation**

Sans dispositif de déconnexion, l'appareil n'est plus conforme aux normes ISO / IEC60079-14 et ISO / IEC61010-1. Le remplacement des fusibles internes ne peut être effectué que par le personnel agréé par Honeywell.

## 2.7.2 Conduit systems and cable glands

**//Cette page est répétée en français. // This page is repeated in French. //**

In the housing of the device are four threaded holes for electrical inlets and outlets. Devices to use conform to cCSAus conditions are supplied with adapters for conduit systems. The conduit system, hubs, fittings, etc. needs a Type rating corresponding to the Type rating of the equipment. Cable glands could not be used in this case.

If the device is not used under cCSAus conditions the threaded holes can be fitted as required with blind plugs, adapters or cable glands. These screw-in parts must be suitable for the IIC Zone and need an explosion-protection certification.



### **DANGER / WARNING / CAUTION (Explosion hazard)**

#### **Use of non-certified or wrong parts (e.g. cable glands)**

The device may only be connected using certified parts. These must comply with local explosion-protection regulations and be installed or replaced by authorized trained personnel. To comply with explosion-protection regulations, they must be installed and sealed as specified by the manufacturer of the part. The relevant regulations must be observed during this process.

Cable entry devices (glands, blanking plugs, adapters and sealing rings) shall be suitable for +80°C  $\pm$ 176°F and must satisfy or exceed the IP rating (IP 64).

NEC-compliant cable inlet equipment must be used in the USA. CEC-compliant cable inlet equipment must be used in Canada. ONLY- Japanese Ex approval listed cable inlet equipment must be used in Japan (contact Honeywell for information on permitted fitting types).



### **PROHIBITION**

#### **Use adapters several times in a row as well as use with blanking plugs**

Only one adapter may be located between the cable gland and the device. Blanking plugs must fit directly into the device bore hole!

Further required properties:

- The cable gland must be sealed and must have explosion-protection certification II2G Ex db IIC T4 Gb

Conduit system (conduit stop boxes as long as they are cast/sealed)

- Within 1 x D from the housing for ATEX and IECEx
- Within 45 cm (18") for FM

### Repeat "Conduit systems and cable glands" in French Répétition "Systèmes de conduits et presse-étoupes" en français

Dans le boîtier de l'appareil se trouvent quatre trous filetés pour les entrées et sorties électriques. Les appareils à utiliser conformément aux conditions cCSAus sont fournis avec des adaptateurs pour les systèmes de conduits. Le système de conduits, les moyeux, les raccords, etc. doivent avoir un indice de type correspondant à l'indice de type de l'appareil. Les presse-étoupes ne peuvent pas être utilisés dans ce cas. *Si l'appareil n'est pas utilisé dans des conditions cCSAus, les trous filetés peuvent être équipés au besoin de bouchons aveugles, d'adaptateurs ou de presse-étoupes. Ces pièces à visser doivent être adaptées à la zone IIC et nécessitent une certification de protection contre les explosions.*



#### **DANGER / AVERTISSEMENT/ ATTENTION (Risque d'explosion)**

##### **Utilisation de pièces non certifiées ou incorrectes (par exemple, des presse-étoupes)**

L'appareil ne peut être raccordé qu'avec des pièces certifiées. Celles-ci doivent être conformes aux réglementations locales en matière de protection contre les explosions et être installées ou remplacées par un personnel qualifié autorisé. Pour être conformes aux réglementations en matière de protection contre les explosions, elles doivent être installées et scellées comme indiqué par le fabricant de la pièce. Les réglementations applicables doivent être respectées au cours de ce processus.

Les dispositifs d'entrée de câble (presse-étoupes, bouchons obturateurs, les adaptateur, et bague d'étanchéité) doivent être adaptés à une température de +80°C  $\pm$ 176°F et doivent satisfaire ou dépasser l'indice IP (IP 64).

Aux Etats-Unis, il faut utiliser des entrées de câbles conformes à la norme NEC. Au Canada, il faut utiliser des entrées de câbles conformes à la norme CEC. SEULEMENT - Les entrées de câbles homologuées Ex au Japon doivent être utilisées au Japon (contactez Honeywell pour obtenir des informations sur les types de raccords autorisés).



#### **INTERDICTION! Utiliser les adaptateurs plusieurs fois de suite ainsi que les bouchons d'obturation.**

Un seul adaptateur peut être placé entre le presse-étoupe et l'appareil. Les bouchons d'obturation doivent s'insérer directement dans le trou de l'appareil !

Autres propriétés requises :

- Le presse-étoupe doit être étanche et doit avoir une certification de protection contre les explosions II2G Ex db IIC T4 Gb

*Système de conduits (boîtes d'arrêt de conduits à condition qu'elles soient coulées/s-cellées)*

- A moins de 1 x D du boîtier pour ATEX et IECEx
- A moins de 45 cm (18") pour FM

## 2.8 Data safety information

### 2.8.1 Security considerations for your network

enCore devices are used in modern accounting infrastructures and network control technology with the task of transmitting process information such as counters, measurements, and messages to an accounting center or control station. Such a connection represents a significant security risk and therefore careful consideration must be given to the design.



#### Reporting a security issue to Honeywell

As soon as you encounter a possible security gap of a Honeywell product, please report it directly to Honeywell.

⇒ [12.5 How to report a security vulnerability](#) (p. 291)

### 2.8.2 Enforce a strong password policy

There are different attacks on passwords today, so you should follow the best practices for managing your passwords. Here are some best practices:

- Always change default passwords.
- Choose strong passwords  
Use a combination of uppercase and lowercase letters, numbers, and special characters when assigning a password. In addition, protection increases with the password length. A strong password consists of at least 8 characters.
- Change passwords on a regular basis.
- Change passwords immediately in case someone has tried to attack the system.



#### Document deviations of the best practices

If the system does not allow one of the best practices to be followed this should be documented. For example: maybe you do not allow the special character “=” in the password.



#### Assign passwords

enCore devices are delivered with standard users without password. We recommend to assign passwords for administrator and all main users during commissioning.

## 2.8.3 Preventing unauthorized external access

To reduce the risk to your network, we highly recommend to include a firewall or some other mechanism to limit the network traffic between the (external) central accounting center resp. control station and the (internal) network for example of the gas measuring plant in a target manner. In addition, enCore devices should only be installed where access control is guaranteed, i.e., where protective measures are taken to prevent unauthorized persons from gaining physical access to the device.

Furthermore, we recommend to allow protocols and ports only that are actually used for data exchange with the external network, for example, by adding these to the white list of the firewall and allow data exchange with trusted participants only.  
⇒ [11.5 Supported data protocols](#) (p. 287))

To avoid a (temporary) shutdown of the LAN interface due to an unintended packet overload, limit the packet rate to a value you expect during normal operation.

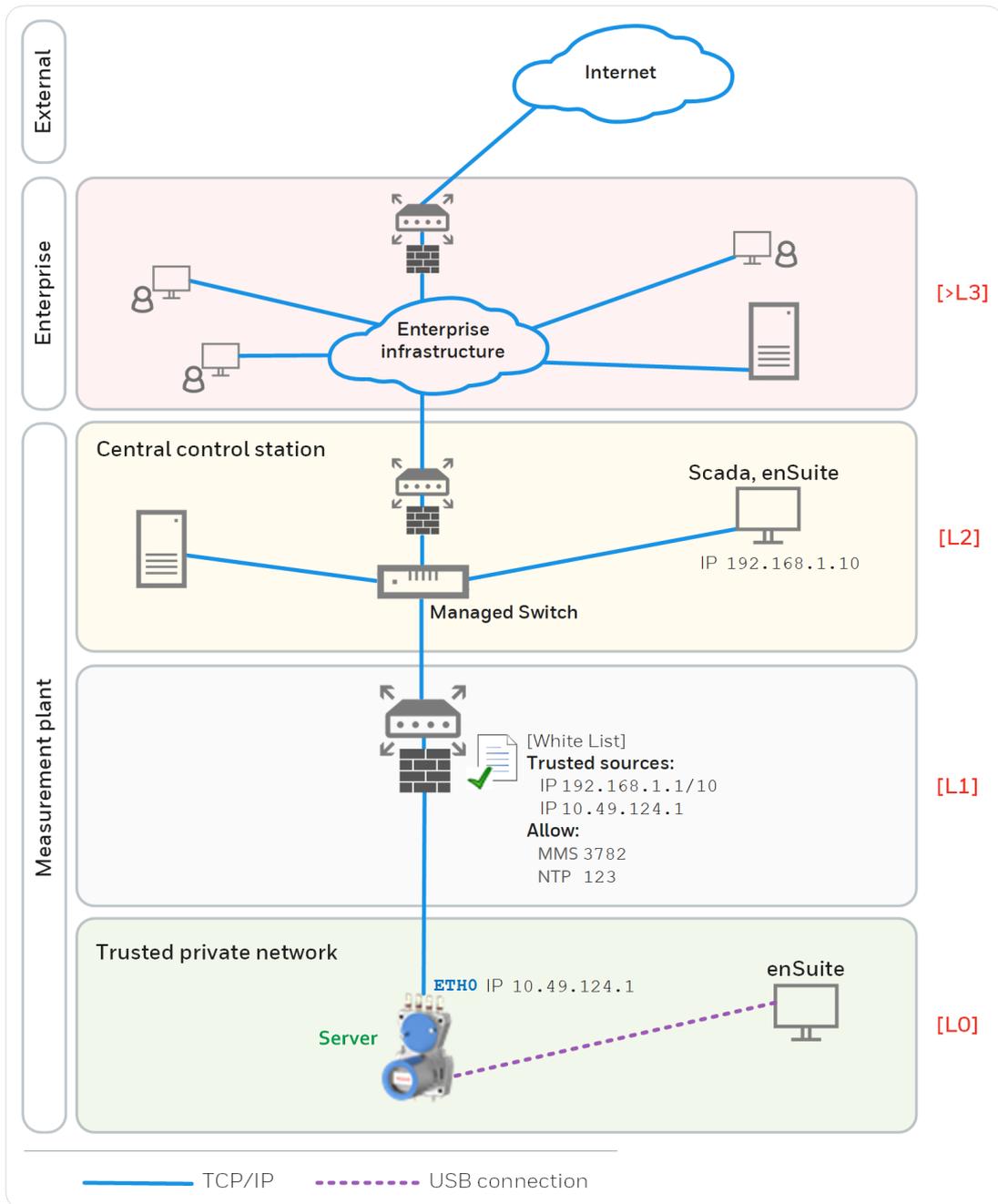


Fig. 2-3: Preventing unauthorized external access to enCore device – example with indication of security zones L0..L3 and higher according to IEC 62443

 We recommend opening safety zone L0 only for zone L1 and not for zones L2, L3 and L4.

## 2.8.4 Security for data at rest and data in transit

### Security for data at rest

enCore devices store all temporary or permanent data on the SD card. The data on the SD card is also called data at rest.

To prevent unauthorized access to sensitive data, enCore devices have been storing this data in encrypted form on the SD card since Basic System V03-39. Since this version, access to sensitive data (e.g., reading out the parameterization) is only possible after authentication with user name and password.

Up to Basic System V03-38, sensitive data was stored on the SD card without encryption. Here it is even more important to protect the SD card against unauthorized removal and the device against unauthorized access!

When discarding the device, you can easily and safely remove the stored data by removing the SD card.

⇒ [2.8.3 Preventing unauthorized external access](#) (p. 41)

### Security for data in transit

Data in transit is the data that is transferred between an enCore device and, for example, a control station in a public or trusted network or between enCore device and enSuite, for example, when transferring data during parameterization of the device.

The communication between enCore device and enSuite is carried out via MMS protocol, which is secured via TLS since Basic System V03-39. Other protocols – e.g., Modbus – transmit data partly in plain text. If possible, use the secure variant of a protocol. (⇒ [11.5 Supported data protocols](#), p. 287)

⇒ [2.8.3 Preventing unauthorized external access](#) (p. 41)



#### NOTICE!

##### Use encrypted VPN connection

We recommend using a VPN connection whenever you need a secure data connection but no secure protocol is supported for data transmission.

In a VPN, data is transferred between two or more participants in encrypted form. For this reason, a VPN connection is recommended, for example, for mobile access to an enCore device, access to the private network or for data communication via different systems.



##### Remote operation panel over insecure HTTP is no longer supported

Since Basic System V03-39 the insecure HTTP is no longer supported. Therefore, the remote operation panel can no longer be opened in the browser of a service computer.

Instead, you access the remote operation panel of an enCore device in enSuite using the action of the same name. In this case, the connection is established via MMS and secured via TLS.

### **TLS certificate for MMS communication with enSuite**

To prevent data from being read by other network users during MMS communication between the enCore device and enSuite, the data is transmitted in encrypted form only since Basic System V>03-39. The encryption is carried out using the TLS (Transport Layer Security) transmission protocol. The enCore device uses a self-signed certificate to authenticate itself to enSuite each time an MMS connection is established. Normally, the certificate is created once when the enCore device is put into operation and announced to enSuite during the first MMS connection. However, it can be newly generated later.

### 3 Structure and inscriptions of GasLab Q2

GasLab Q2 is a compact device housed in a two-piece explosion-proof aluminum housing. The parts are mechanically and electrically connected. The measuring instrument contains all parts required to fulfill the measuring task. The built-in additional housing heater and an integrated fan allow an operating temperature range from  $-25^{\circ}\text{C} \triangleq -13^{\circ}\text{F} \triangleq 248 \text{ K}$  to  $+55^{\circ}\text{C} \triangleq +131^{\circ}\text{F} \triangleq 328 \text{ K}$ . From a functional point-of-view, the hard work can be divided into three sections.



Fig. 3-1: Overview Hardware sections

The **connection section** (shown in orange in the diagram) constitutes the interface to external connections, such as the gas supply and electrical cables.

The **instrumentation section** (shown in yellow in the diagram) primarily contains the structure with function modules and provides access for production and service work.

The **human-machine interface** (HMI interface shown in green in the diagram) is the interface to the user.

These sections are explained in more detail in the following.

## 3.1 Connection section

The connection section is sub-divided into the following parts:

- Gas connections (inputs/outputs and breather)
- Electrical connections (cable inlet and connection circuit board)

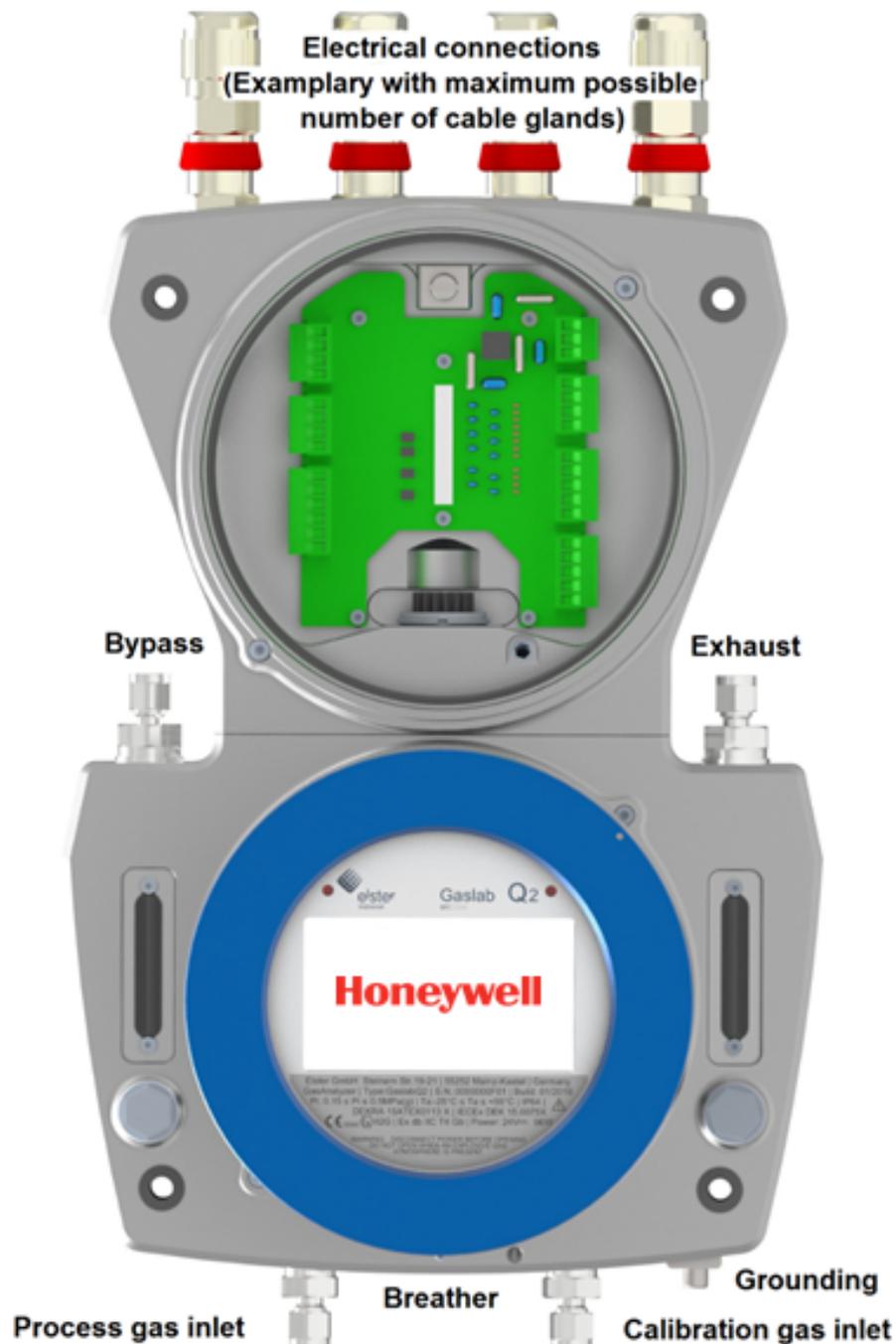


Fig. 3-2: Overview of connection section / connection points

### Gas connections (inlets / outlets and breathing elements)

The gas connections are pipe fittings and are equipped by the manufacturer.

The gas inlets are located at the bottom of the device. Left for process gas with integrated particle filter. This inlet can also be used for test gas or verification gas. On the bottom right is the inlet for the operational calibration gas. This inlet has no particle filter and is only suitable for connecting particle-free gases.

The gas outlets are located on the upper side of the lower housing part, i.e. in the middle of the device. On the right is the gas outlet for the vent gas from the measurement. On the left is the outlet for gas that can flow through a bypass, e.g. if there are long supply lines and the reduction of the reaction time is desired. The outflowing gas is discharged into separate vent lines for each outlet.

Two breathing points are used to enable atmospheric pressure equalisation between the inside of the device and the environment. These breathing devices must not be closed or blocked. The main breathing device is in the middle of the bottom, the auxiliary breathing devices are located on the back of the device in the upper part of the housing.



Further information ⇒ [5.4 Fluidic installation of the measuring device](#)  
(p. 66)

### Electrical connections (cable inlet and connection circuit board)

The overview shows an example of four cable glands for electrical inputs and outputs on the top of the instrument. If required, the threaded holes of the housing can also be equipped with dummy plugs or adapters.

The illustration shows, in the upper part of the instrument, also the connection box located below the cable glands. It contains a circuit board with all electrical interfaces. These can be connected with connection cables via plugs on the edge of the board. In the middle of the board is the connection to the lower part of the housing. This connector is secured by barbs and must not be removed.

The housing must be grounded or connected to the local potential equalization. For this purpose, there is an earthing and equipotential bonding screw (GROUND) on the bottom next to the calibration gas inlet. A further functional grounding point (FE) is in the connection box in the upper recess of the board. See Figure 3.2.

Proper operation can only be guaranteed if all system components have the same ground potential.



Further information ⇒ [5.6 Electrical installation](#) (p. 74)

## 3.2 Instrumentation section

The instrumentation section contains gas-carrying and measurement components. These include the double-block-and-bleed valve block (DBB) for gas channel switching as well as the sensor block with pressure control and sensors, see also [4.1 Description of the measuring method](#) (p. 56).

All this is accommodated in the lower part of the instrument, the so-called functional housing and the cylinder connected to it.

Only in the outside area there are elements accessible to the user.

These are located on the left and right of the functional housing

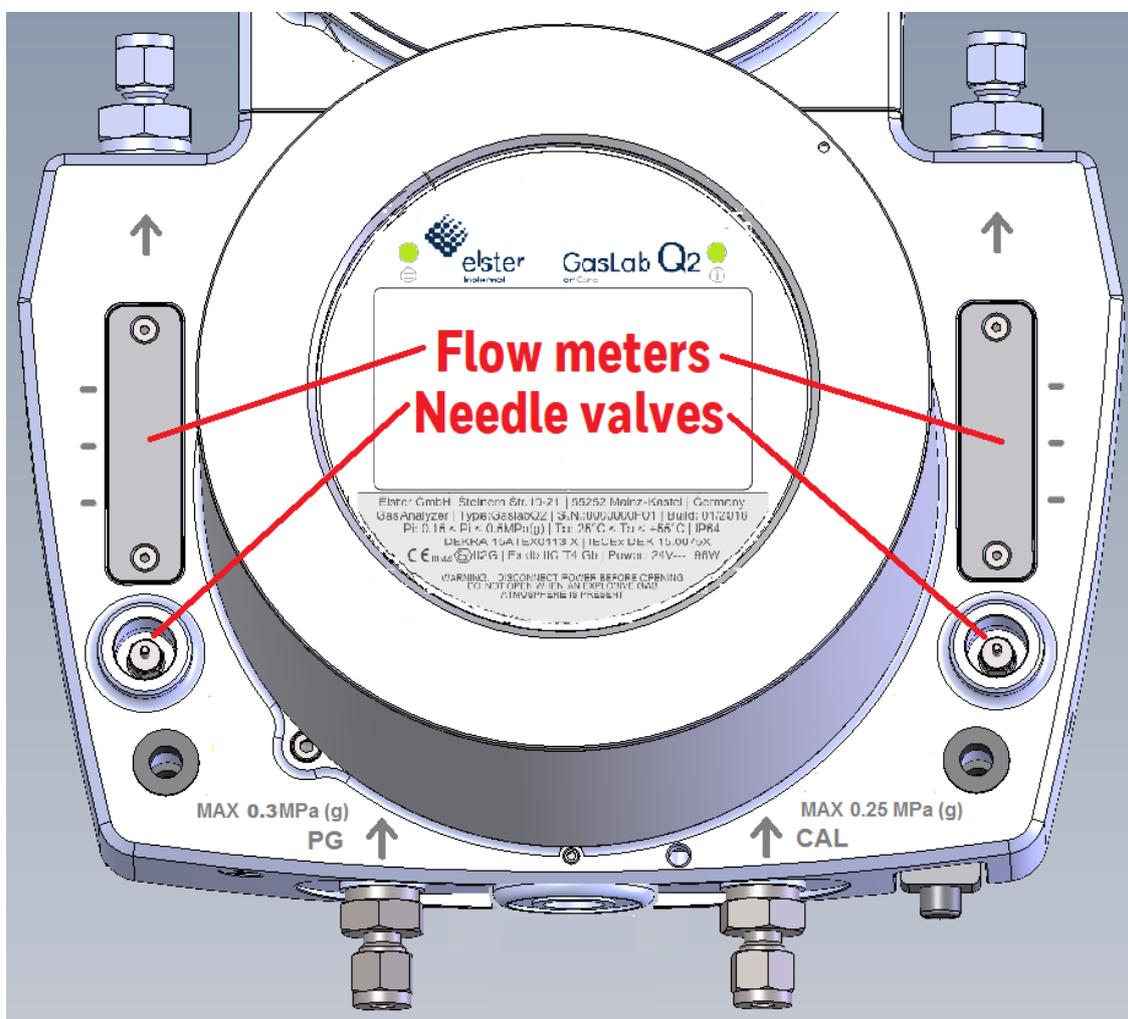


Fig. 3-3: Accessible elements of the instrumentation section

The gas to be analysed reaches the sensor block through the inputs via the DBB valve block. After it has been analysed there, it returns to the bottom section of the housing on the right-hand side. The right-hand flow meter and the right-hand needle valve are used to display and regulate the flow of vent gas from the measurement. The side markings of this flow meter show the usual flow rates of approx. 30 l/h (bottom) approx. 40 l/h (middle) and approx. 60 l/h (top).

The left-hand flow meter shows the gas flow in the bypass. This can be used optionally, e.g. for long supply lines, to accelerate sampling. The flow rate is regulated by the needle valve below it. The ball begins to float at approx. 55 l/h. The side markings indicate flow rates of approx. 90 l/h (bottom) 125 l/h (middle) and 160 l/h (top). When the upper end is reached, the maximum flow rate is set at approx. 310 l/h.



The flow meters are used for visual function control and only for rough estimation of the flow rate. If the ball is within the marks, there is enough flow for operation. A gas flow already exists even with stationary balls. Honeywell recommends the use of an additional flow meter in the gas path in cases where the exact flow rate is critical. (This can be removed again after the adjustment procedure)

### 3.3 Human-machine interface (HMI)

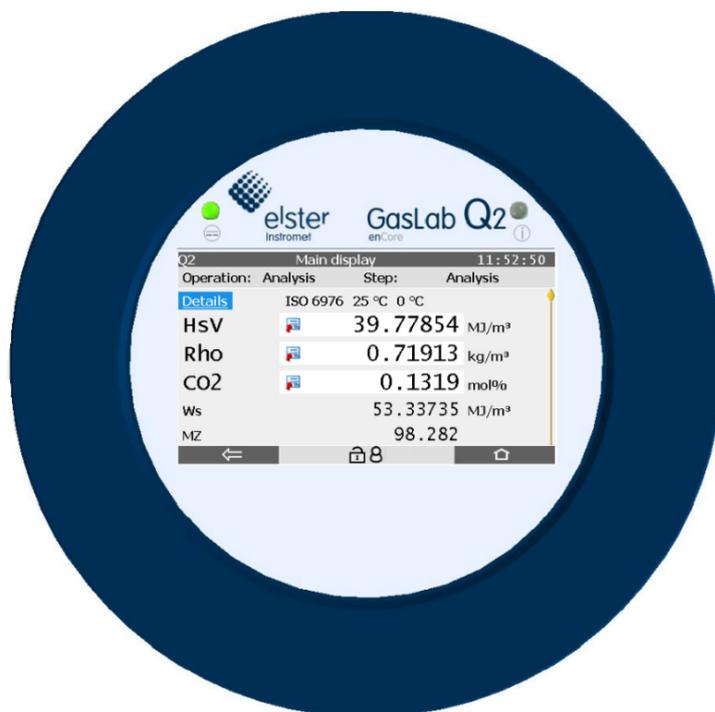


Fig. 3-4: Example of interactive display/operation panel

The actual interface to the human operator, the human-machine interface (HMI), essentially consists of an interactive display behind a glass window, also called operation panel, and two status LEDs that indicate the status of the device.

During normal operation the GasLab Q2 can be operated completely via the operation panel, which is equipped with 7 touch fields, as it allows direct reading of the measured and target values as well as control and settings. A screen keyboard is displayed if necessary. Various languages are possible.

In addition, the HMI area consists of electronic circuits on circuit boards which are invisible to the operator. These share the cylinder of the instrumentation area with the measurement components and handle the control, display and archiving of measurement data.

The glass window can be closed using a screw-on cover, the sand guard. See also section [⇨ 5.3.2 Device dimensions](#) (p. 65).

Operation and control are not only possible directly at the instrument, but also remotely via network and with the corresponding PC software.



The software is described in more detail in sections

⇨ [7 GasLab Q2 operation panel and operation](#) (p. 103)

⇨ [8 Configuration and analysis software enSuite](#) (p. 169)

## 3.4 Type labels and setting marks

The main type label with the most important information is located below the interactive screen, behind the inspection window. If the type label is covered by the sand guard, this information can also be read off an additional type label on the outside of the housing. In some cases, the main type label does not offer enough space for all information, so there may be additional warning and type labels on the housing. The following figure shows the positions of the type labels and warnings on the device.

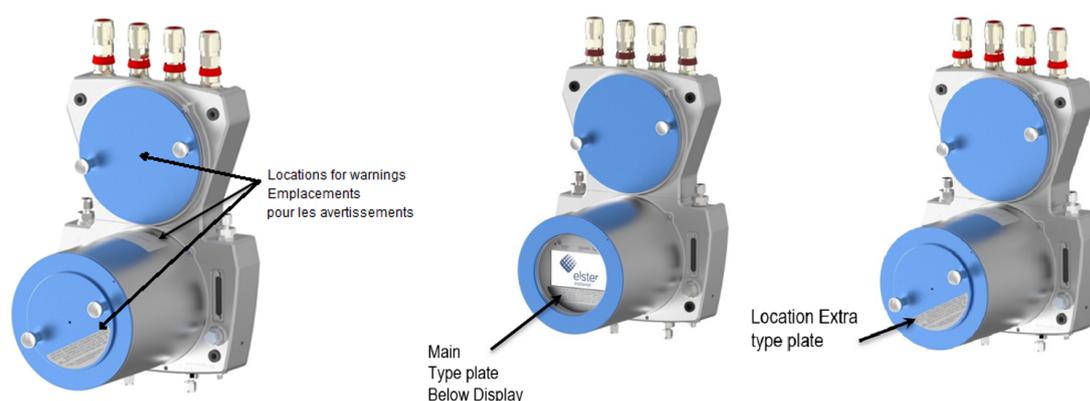


Fig. 3-5: Beispiel Positionen der Typenschilder und Warnhinweise

The equipment of the device with type labels depends on the country of use and the approvals. The type labels will vary in terms of language and the specified standards or regulations. The following information is always contained on the label(s):

### Information

Manufacturer and manufacturer's address with the address of the production site

Device type, type designation, serial number and year of manufacture MM/YYYY

Warning to refer to this document, environmental regulations to be complied with and 2 D matrix code

Gas inlet pressure range\* Ambient temperature range Enclosure (protection class (IP))  
Voltage and power consumption

Warning and connection instructions, on a separate label if several languages are necessary

\* The input pressure range depends on the application; deviations are also possible on request.



### NOTICE AVIS

**Information on the device (type labels and engravings)**  
***Les informations sur l'appareil (plaques signalétiques et gravures)***

must always be observed and followed!

*doivent toujours être observées et suivies !*

In addition, the type labels contain information about the approvals granted and the explosion protection properties. Not all certificates and approvals are listed in this documentation. The following table shows a selection.

**Approvals (selection) Only the specifications on the respective device apply!**

(For EU) Approval number DEKRA 15.ATEX0113X /IECEX DEK 15.0075X  
CE mark with auditor number

Approval number FM: FM17US0040X/FM17CA0027X Class I Div 2 Groups ABCD T4

Ex rating: (II 2G) (A) Ex db IIC T4 Gb (for ATEX IECEX and FM)

Depending on application, measuring ranges of the evaluation certificate according to OIML R 140 for calorific value determining devices could be also mentioned. The following figure shows examples of main type plates and a metrological type plate (bottom right).

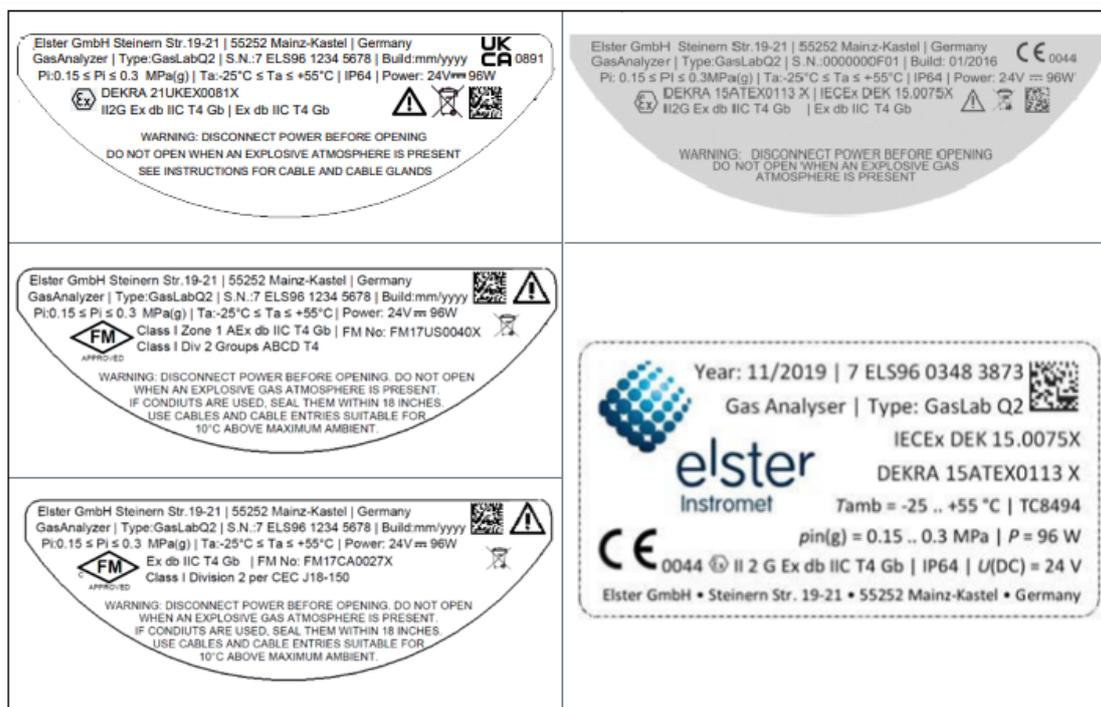


Fig. 3-6: Type labels (examples)

Apart from the type labels, there is still engraved information on the device. Next to the flow meters there are setting marks for the gas flow rates.

Arrows at the inlet and outlet indicate the direction of the gas flow. Above the gas inlets, the maximum inlet pressures are also indicated, which must not be exceeded under any circumstances.

On the underside of the device there is the designation GROUND for the electrical connection to the equipotential bonding system and earth. These specifications must also always be observed!

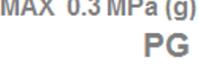
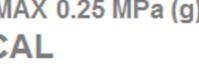
	Setting marks for the gas flow rates
	Arrows for the direction of gas flow
	Maximum inlet pressure process gas
	Maximum inlet pressure Calibration gas
	Potential equalization connection point (PA)

Fig. 3-7: Engraved device Information

## 3.5 Explosion protection markings (explanation)

### *Explication des marquages de protection contre les explosions*

Icons / symbols <i>Icônes / symboles</i>	Meaning / Signification
  <p>Device Ex symbol <i>Symbole Ex de l'appareil</i></p>	<p>Designations around these symbols (on the nameplate) indicate the area of application taking explosion protection into account.</p> <p><i>Les désignations autour de ces symboles (sur la plaque) indiquent le domaine d'application en tenant compte de la protection contre les explosions.</i></p> <p>Notified body, device group, device category, Ex zone, Ex class, type of protection, explosion group, temperature class and device protection level are indicated among other things.</p> <p><i>Sont indiqués entre autres, l'organisme notifié, le groupe d'appareils, la catégorie d'appareils, la zone Ex, la classe Ex, le type de protection, le groupe d'explosion, la classe de température et le niveau de protection de l'appareil.</i></p>

Used Shorthand <i>Raccourci utilisé</i>	Description / Explanation / <i>Explication</i>
0044	<p>Ex marking for <b>Notified Body</b> <i>Marquage Ex pour l'Organisme notifié</i></p> <p>Notified Bodies are state notified and supervised testing bodies. On behalf of the manufacturer, they inspect the conformity or compliance with corresponding standards and regulations for his products and/or his production.</p> <p><i>Organismes notifiés Ce sont des organismes d'essai notifiés et contrôlés par l'État. Au nom du fabricant, ils contrôlent la conformité ou le respect des normes et réglementations correspondantes pour ses produits et/ou sa production.</i></p>

Used Shorthand <i>Raccourci utilisé</i>	Description / Explanation / Explication
II 2 G	<p>Ex marking complete device suitable for ex- zone 1 and 2 (gases/vapors) <i>Marquage Ex appareil complet adapté pour les zones Ex 1 et 2 (gaz/vapeurs)</i></p> <p><b>Ex zones</b> Potentially explosive areas are divided into zones according to the frequency and duration of occurrence of hazardous explosive atmospheres. The following applies to flammable gas-air mixtures:</p> <p><b>Zones Ex</b> <i>Les zones potentiellement explosibles sont divisées en zones selon la fréquence et la durée d'apparition des atmosphères explosives dangereuses. Ce qui suit s'applique aux mélanges gaz-air inflammables :</i></p> <p><b>Zone 0 / Division 1</b> is an area in which a hazardous explosive atmosphere is present continuously, for long periods or frequently. <i>La Zone 0 / Division 1 est une zone dans laquelle une atmosphère explosive dangereuse est présente en permanence, pendant de longues périodes ou fréquemment.</i></p> <p><b>Zone 1 / Division 1</b> is an area in which a hazardous explosive atmosphere may occasionally occur during normal operation. <i>(Division 1 comprises the combination of Zone 0 and Zone 1 areas)</i> <i>La Zone 1 / Division 1 est une zone dans laquelle une atmosphère explosive dangereuse peut occasionnellement se produire pendant le fonctionnement normal. (La division 1 comprend la combinaison des zones 0 et 1)</i></p> <p><b>Zone 2 / Division 2</b> is an area in which a hazardous explosive atmosphere normally does not occur during normal operation, and if it does, it does occur only rarely and for a short period of time. <i>La Zone 2 / Division 2 est une zone dans laquelle une atmosphère explosive dangereuse ne se produit normalement pas pendant le fonctionnement normal et, si c'est le cas, elle ne se produit que rarement et pour une courte période de temps.</i></p>
Ex db / AEx db	<p>Principle and type of ex-protection (in this case flameproof enclosure) <i>Principe et type de protection Ex (dans ce cas, un boîtier anti-flamme)</i></p> <p><b>Flameproof enclosure</b> By using <b>this protection principle and type of protection</b> parts that can ignite an explosive atmosphere are enclosed in a housing. The enclosure will withstand an internal explosion and prevent transmission to the atmosphere surrounding the enclosure.</p> <p><b>Boîtier anti-flamme</b> <i>En utilisant ce principe de protection et ce type de protection, les parties qui peuvent enflammer une atmosphère explosible sont enfermées dans un boîtier. Le boîtier résiste à une explosion interne et empêche la transmission à l'atmosphère qui l'entoure.</i></p>
IIC	<p>Ex marking of <b>Explosion group</b> <i>Marquage Ex du groupe d'explosion</i></p> <p><b>Group I</b> contains equipment for mine workings endangered by firedamp. Le <b>groupe I</b> contient les équipements pour les exploitations minières menacées par le grisou.</p> <p><b>Group II</b> for all other potentially explosive atmospheres. The classification is based on the equipment design and the hazardousness of the gases. It increases from explosion group II A to II C. <b>Groupe II</b> : <i>pour toutes les autres atmosphères explosibles. La classification est basée sur la conception de l'équipement et la dangerosité des gaz. Elle passe du groupe d'explosion II A au groupe II C.</i></p>

Used Shorthand <i>Raccourci utilisé</i>	Description / Explanation / Explication
T4	<p>Ex marking of <b>Temperature class</b> (in this case 135°C)</p> <p>Marquage Ex de <b>la classe de température</b> (dans ce cas, 135°C)</p> <p>The maximum surface temperature of the device must always be lower than the ignition temperature of the explosive mixture. The following temperature classes are specified:</p> <p><i>La température maximale de surface de l'appareil doit toujours être inférieure à la température d'inflammation du mélange explosif. Les classes de températures suivantes sont spécifiées :</i></p> <p>T1=450 °C (842 °F) T2=300 °C (572 °F) T3=200 °C (292 °F)  T4=135 °C (275 °F) T5=100 °C (212 °F) T6= 85 °C (185 °F)</p>
Gb	<p>Ex marking of <b>Equipment protection level (EPL)</b> (in this case "high")</p> <p>Marquage Ex du <b>niveau de protection de l'équipement</b> (dans ce cas, « élevé »)</p> <p>Equipment for potentially explosive atmospheres where there is no risk of ignition during normal operation is classified in three levels of protection. These apply to gas (G) and dust (D)</p> <p><i>Les équipements destinés aux atmosphères explosibles où il n'y a pas de risque d'inflammation pendant le fonctionnement normal sont classés en trois niveaux de protection. Ceux-ci s'appliquent au gaz (G) et à la poussière (D).</i></p> <p>„Very high” protection level (<b>Ga or Da</b>)  no danger of ignition in case of foreseeable or rare malfunctions</p> <p><i>Niveau de protection « très élevé » (Ga ou Da).</i>  <i>Aucun danger d'inflammation en cas de dysfonctionnements prévisibles ou rares</i></p> <p>„high” protection level (<b>Gb or Db</b>)  no danger of ignition in the event of foreseeable faults or malfunctions</p> <p><i>Niveau de protection « élevé » (Gb ou Db).</i>  <i>Aucun danger d'inflammation en cas de défauts ou de dysfonctionnements prévisibles.</i></p> <p>„increased” protection level (<b>Gc or Dc</b>)  Additional protective measures are taken to ensure that there is no danger of ignition in the event of foreseeable malfunctions of the device.</p> <p><i>Niveau de protection « accru » (Gc ou Dc)</i>  <i>Des mesures de protection supplémentaires sont prises pour éviter tout risque d'inflammation en cas de dysfonctionnement prévisible de l'appareil.</i></p>

## 4 Measuring method and measuring point

In the analysis mode, the gases are measured in a continuous flow every second and the calculations of the gas composition are updated. The measured values can be displayed on site and forwarded to a control room, for example.



The application is described and explained in detail in the sections  
⇒ [7 GasLab Q2 operation panel and operation \(p. 103\)](#) and  
⇒ [8 Configuration and analysis software enSuite \(p. 169\)](#)

### 4.1 Description of the measuring method

The used correlative measuring principle is based on the determination of infrared absorption and the thermal conductivity of the gas being analyzed. Instead of the gas values such as superior calorific value, density at base conditions and CO<sub>2</sub> content, the measuring method uses values which are physically related to the target values and are easier to measure. GasLab Q2 therefore analyzes the following gas properties:

- Infrared (IR) absorption of the CH gas
- Infrared (IR) absorption of the CO<sub>2</sub> gas
- Thermal conductivity of the full gas mixture
- Pressure and gas temperature

All the partial measurements are subjected to a correlative evaluation process which is based on the physical background, the typical composition of natural gas. The nitrogen, as well as the superior calorific value, density at base conditions and CO<sub>2</sub> content can be calculated using an appropriate equation system.

The Wobbe index can be calculated using the superior calorific value and density at base conditions. These values are enough to determine the other properties of the natural gas. This means that all the main gas components can be identified directly or indirectly and are available for further processing. The figure shows a schematic overview of the measuring principle (without pressure and temperature).

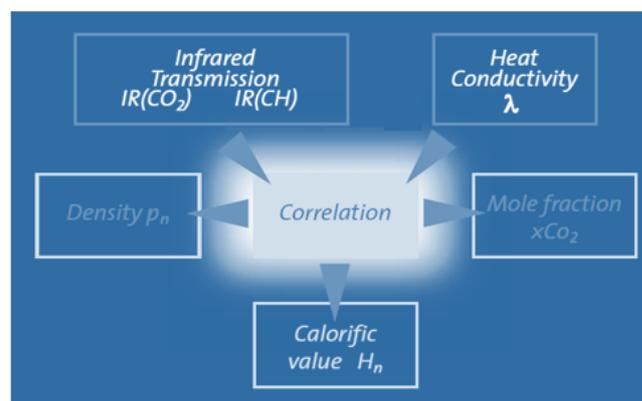


Fig. 4-1: Measuring method

The physical measurement is carried out in the instrumentation section with the aid of a sensor block containing the electronics for the complete control, regulation, measurement acquisition and transmission.

A two-channel double block and bleed valve block (DBB) supplies the gases to the sensor block. Each gas channel is shut off by 2 solenoid valves. There is ventilation between the valves. This DBB technology prevents the supplied gases mixing, even if the valves leak. The figure shows a layout of the gas routes. The arrows indicate the flow direction of the gas. |

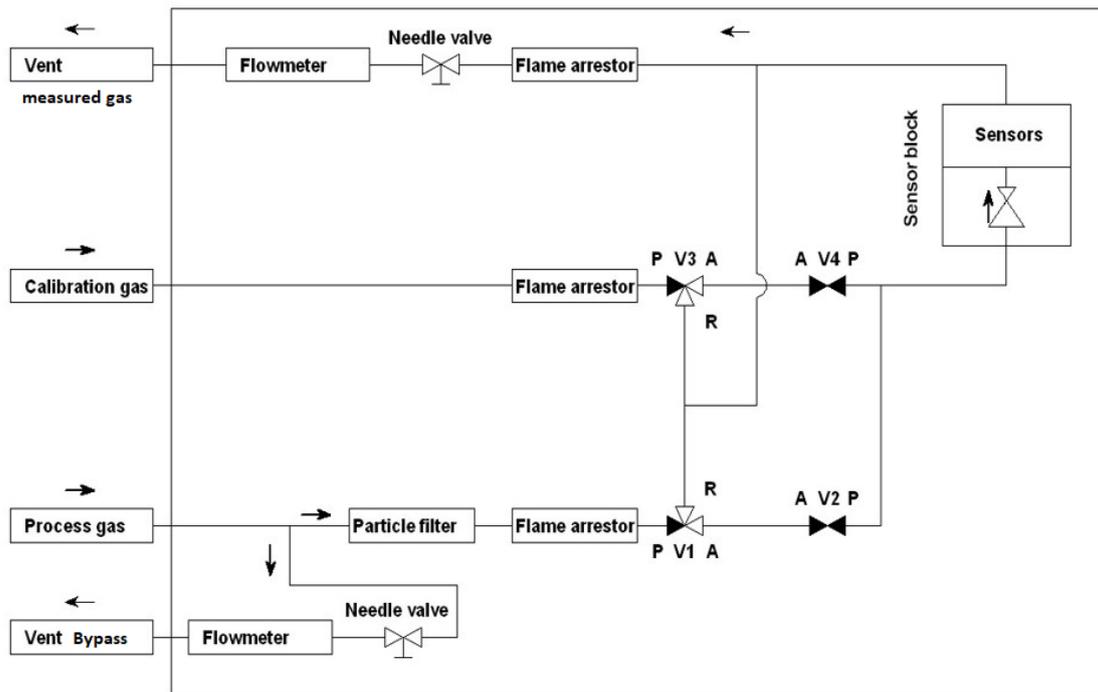


Fig. 4-2: Gas routes in the device

The sensor block consists of parts with gas channels as well as the electronics and sensors. An integral pressure regulator reduces the inlet pressure for measurement. The measuring system typically operates at a gauge pressure of around 16 KPa  $\pm$  2.32 psi  $\pm$  160 mbar. The gas is then supplied to the actual sensor chamber. The infrared sensor and the thermal conductivity sensor analyze the gas there and a pressure transmitter measures the gas pressure.

The block is heated electrically to 70°C  $\pm$  158°F  $\pm$  343K to ensure stable results. An installed fan prevents the temperature from rising too high. A temperature sensor records this block temperature, which is called TSB.

After the measurement the gas is led back into the lower part of the housing. The typical flow rate is between 1.059ft<sup>3</sup>/h to 2.118 ft<sup>3</sup>/h  $\pm$  0.03 m<sup>3</sup>/h to 0.06 m<sup>3</sup>/h  $\pm$  30 l/h to 60 l/h. The flow rate may be changed depending on the application.

## 4.2 Measuring point overview

A typical measurement point consists of a sampling line from the gas pipeline to the measurement device. The stream of gas is measured quickly and continuously and then fed into the vent (waste) gas. If the pipeline pressure is higher than the maximum inlet pressure of the GasLab Q2, a pressure reduction system must be installed and adjusted upstream of the process gas inlet.

The operational calibration gas mixture is generally supplied using a gas cylinder with a pressure reducer near the GasLab Q2 and ensures that the measuring accuracy is maintained. The gas in a  $10 \text{ l} \pm 0.01 \text{ m}^3 \pm 0.353 \text{ cft}$  cylinder will suffice for several years of operation. The vent (waste) gas line should be routed separately, see [5.4.2 Connect the vent gas line](#) (p. 68) for details. In general, all pipes and components should be permanently installed. The power supply and the communication cables must be connected and installed as usual in industrial environments. The following diagram shows a typical system layout:

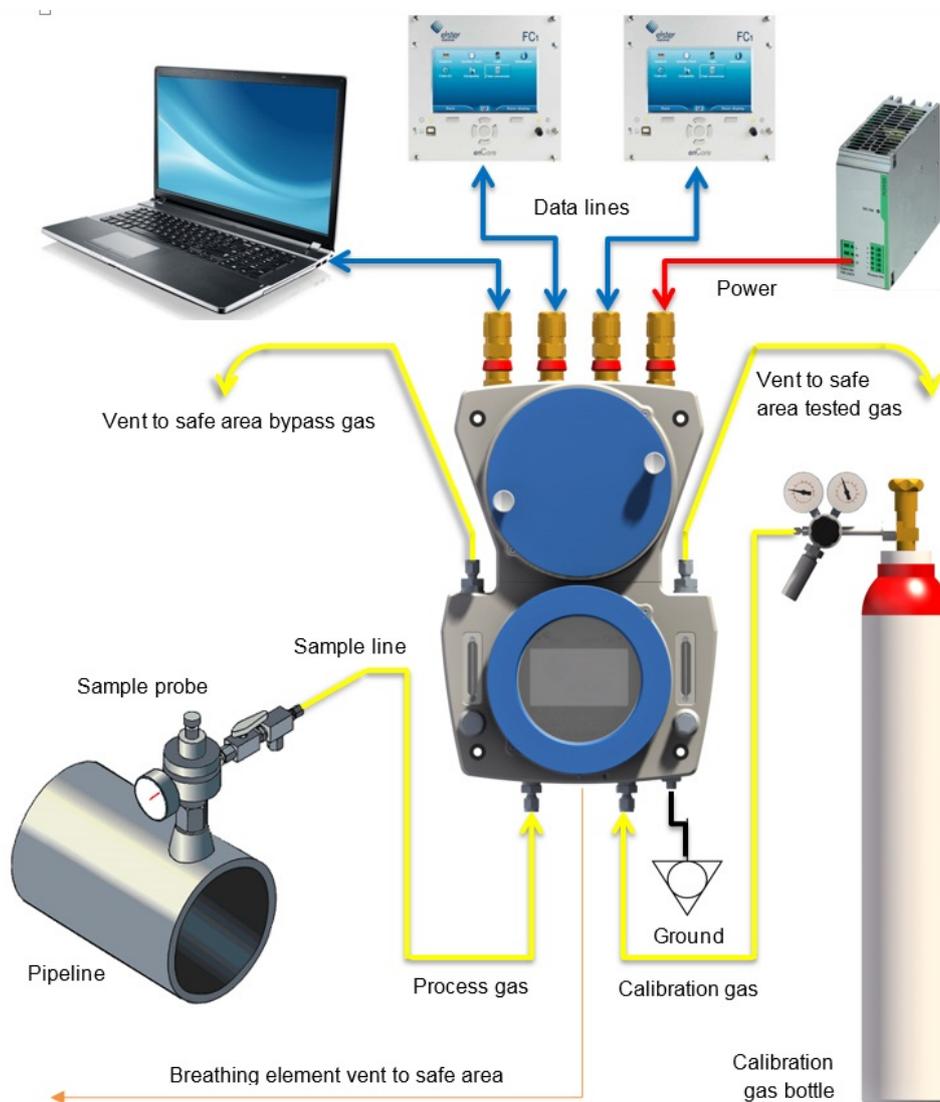


Fig. 4-3: System overview

## 5 GasLab Q2 after delivery and at the place of use

This section gives an overview of how to handle the device before, during and after installation at the place of use.



### NOTICE AVIS

**Improper device handling (storage/ transport/ assembly)**  
***Manipulation incorrecte de l'appareil (stockage/ transport/ montage)***

Malfunctions and damage of the device are possible!

*Des dysfonctionnements et des dommages de l'appareil sont possibles !*

Observe the notes in this document and on the device packaging.

*Respectez les consignes figurant dans ce document et sur l'emballage de l'appareil.*

### Sequence of the required work:

- 01 Unpack the measurement device and any other components and check them for signs of damage and missing or incorrect parts.
- 02 Install the device in its position using the fastening materials provided  
⇒ [5.3 Mechanical installation GasLab Q2](#) (p. 62)  
or storage the device properly again until its installation ⇒ [5.1 Storing GasLab Q2](#) (p. 60).
- 03 Connect the gas lines as well as the auxiliary and vent lines to the device and set the gas pressures, open the shut-off valves and check all lines for leaks. ⇒ [5.4 Fluidic installation of the measuring device](#) (p. 66).
- 04 Install the power supply and connect the communication cables. ⇒ [5.6 Electrical installation](#) (p. 74)
- 05 Install the ⇒ [8 Configuration and analysis software enSuite](#) (p. 169) on your computer/ laptop (parameterization device) if you wish to use the extended device functions.

The installation sequence of the device is described in detail in the following subsections.

## 5.1 Storing GasLab Q2

### Prerequisite(s)

- The environmental specifications listed in the device data sheet are complied with.
- The packages are stored packed in closed, clean and dry rooms.
- Mechanical shocks (vibrations) do not occur during storage.

During storage, the device is not connected to the power supply. For this time, the battery ensures internal data retention.

- for storage times within one year, the device is (again / still) ready for use.
- for storage times between 1 and 3 years, the device is not ready for use again until the battery has been replaced.



**NOTICE Fully discharged battery**  
**AVIS Batterie complètement déchargée**

Data will be lost if the battery is completely discharged during the storage period. Save important data on a PC before storage.

*Les données seront perdues si la batterie est complètement déchargée pendant la période de stockage. Sauvegardez les données importantes sur un PC avant de les stocker.*

After three years, the battery is completely discharged. Contact our technical support if you want to store the device longer than three years.

## 5.2 Transporting GasLab Q2



### PROHIBITION INTERDICTION

- Remove of transport guards and other safety devices, for example, for gas connections, before the device has been installed at its place of use and if dirt can still penetrate it.

*Retirer les protections de transport et autres dispositifs de sécurité, par exemple pour les raccords de gaz, avant que l'appareil n'ait été installé sur son lieu d'utilisation et si la saleté peut encore y pénétrer.*

### Prerequisite(s)

- Transport protection guards and protective devices, e.g. for gas connections, are attached to the instrument.

### Steps

- 01 Transport the device to its place of use, avoiding extreme temperature fluctuations and the formation of condensation.
- 02 Check the device for condensation, if no condensation has occurred during transport the device can be used immediately. Otherwise, continue to the next step.
- 03 Slowly bring the device to room temperature.
- 04 Open the device ⇨ [5.5.1 Opening GasLab Q2](#) (p. 70) and let it dry for at least 12 hours. If necessary, contact Honeywell.

## 5.3 Mechanical installation GasLab Q2



### PROHIBITION INTERDICTION

Carry out any of the work mentioned in this section if you do not have *Effectuer l'un des travaux mentionnés dans cette section si vous ne possédez pas*

- the necessary instructions from the manufacturer or his representatives!  
*les instructions nécessaires du fabricant ou de ses représentants !*
- the permission of the plant operator  
*l'autorisation de l'exploitant de l'installation*

Select an installation height between 1.10 m  $\pm$ 3.608ft and 1.8m  $\pm$ 5.906ft above the floor which is suitable for operation and reading. An empty space with minimum dimensions of 270 mm  $\pm$ 10.63 inch wide and 500 mm  $\pm$ 19.69 inch long in the field of view must be available.

We recommend that you use larger gaps to make installation and maintenance work easier.

Prevent dirt and / or moisture from entering the device during work and possibly causing damage.

## 5.3.1 Place of use and installation

The measuring device should be installed as close as possible to the process gas sampling point in order to avoid long supply lines, since the volume and pressure of the line, in addition to the dead time of the measuring device itself, determine the timeliness of the measurement result.

**The installation site must meet the safety conditions see**

⇒ [2.2 Place of use environmental conditions and installation](#) (p. 22)



### NOTICE AVIS

**Extreme conditions at the installation site, e.g. outside buildings. *Conditions extrêmes sur le site d'installation, par exemple à l'extérieur des bâtiments.***

Incorrect measurements or device damage are possible !

*Des mesures erronées ou des dommages à l'appareil sont possibles !*

Protect the device from direct sunlight and rain, e.g. by using a metal roof or an additional air-conditioned housing. Make sure that the device cannot be hit by a jet of water (e.g. when cleaning the system).

*Protégez l'appareil des rayons directs du soleil et de la pluie, par exemple en utilisant un toit métallique ou un boîtier climatisé supplémentaire. Veillez à ce que l'appareil ne puisse pas être touché par un jet d'eau (par exemple, lors du nettoyage de l'installation).*



**The sand guard (HMI cover) should be screwed on in sandy environments. Contact Honeywell for further information.**

The meter weighs approximately. 16 kg  $\pm$  36 lb . Before mounting, make sure that the mounting surface has the sufficient stability.

**GasLab Q2 must be installed so that the main breather element points downwards and the cable connections point upwards.**

GasLab Q2 does not require a special mounting plate since the measurement device contains all the parts required for the measuring task in its explosion-protected housing. It may be installed on a flat vertical surface (wall/measuring board). Use the 8 mm  $\pm 0.31$  inch fastening holes provided in the housing for this purpose. Use size M8 (minimum M6) fastening material or equivalent in all four fastening holes to secure the device. Suitable complements (in other words, nuts or anchors) depend on the material and the type of installation surface.

The material to which the unit is attached must be able to withstand a combined vertical load of 1000 N at the four attachment points, equivalent to a weight of approximately 100 kg.



**DANGER Working in hazardous areas**  
**DANGER Travailler dans des zones dangereuses**

Risk of damage to health, environment and plant

*Risque d'atteinte à la santé, à l'environnement et à l'installation*

Obey the explosion-protection rules at all times when working with tools or on items in hazardous zones.

*Respectez à tout moment les règles de protection contre les explosions lorsque vous travaillez avec des outils ou sur des objets dans des zones dangereuses.*

## 5.3.2 Device dimensions



Please note all dimensions are given metric and in mm.

1 mm = 0.03937" NPT adapters are available for the threads

The dimensions with information (1 (2 (3 depend on the types of fluid and electrical couplings used.

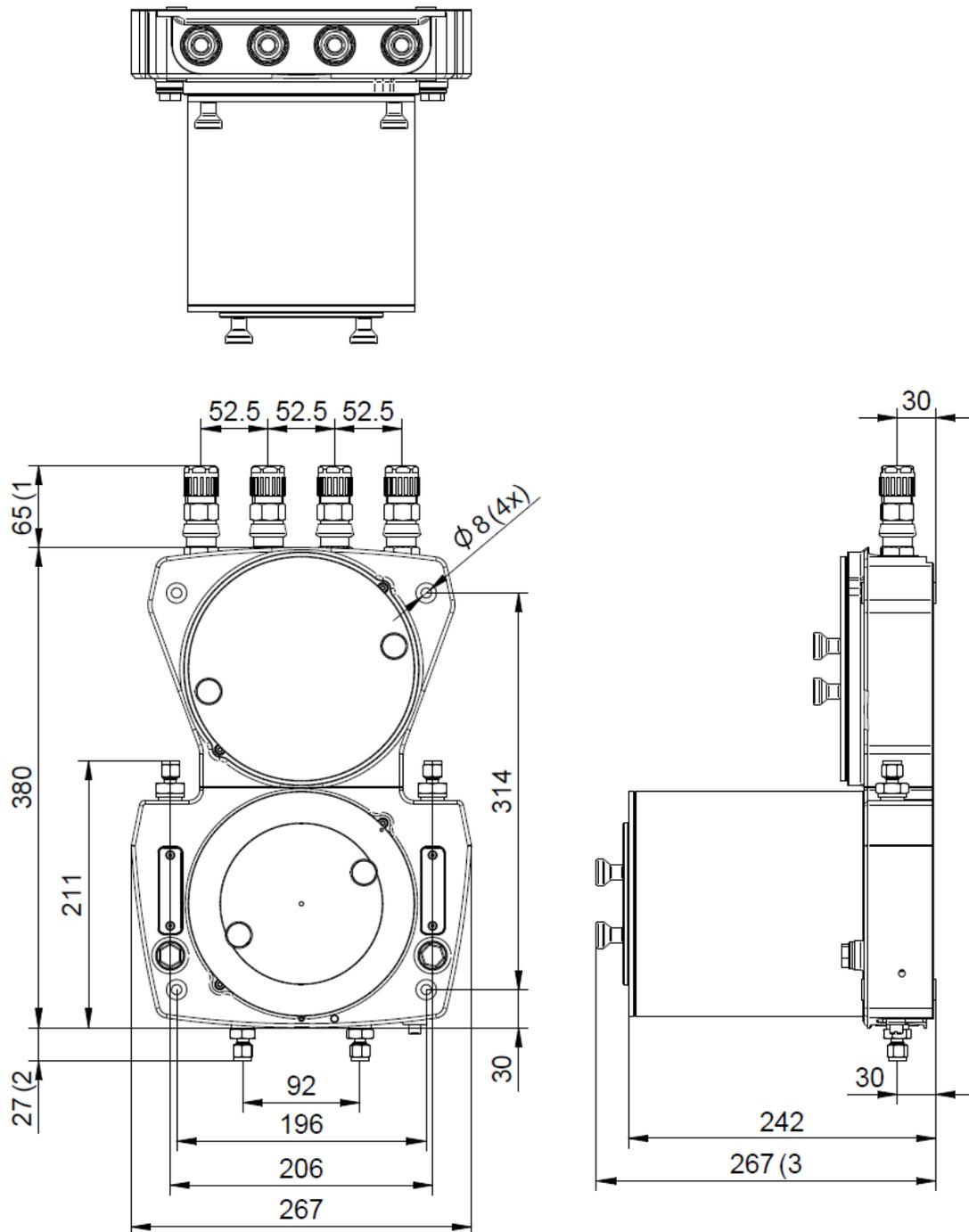


Fig. 5-1: Dimension drawing (with optional sand guard)

## 5.4 Fluidic installation of the measuring device

For all work described in the following, the recognized rules of technology for handling high purity gases and the piping plans drawn up and specified by the plant operator must be observed. Surfaces which come into contact with gas must be free of grease, oil, solvents and other impurities.

Avoid mixing compression fittings from different system suppliers. If this is not possible, check the compatibility of the systems before making the gas-technical device connection.



### PROHIBITION INTERDICTION

- Carrying out the work described without the permission of the plant operator.

*Exécution des travaux décrits sans l'autorisation de l'exploitant de l'installation.*

- Installations that make it possible to exceed the maximum pressure at the gas connections of the device.

*Installations permettant de dépasser la pression maximale au niveau des raccords de gaz de l'appareil.*



All gases must not be contaminated or adulterated when being transported from the source (pipeline or cylinder) to the measurement device.

Only use permanently connected, tight, clean stainless-steel gas lines. Fittings and pipe couplings with few dead spaces are to be preferred.

Route the gas pipelines to the instrument. Ensure that every pipeline and every gas route is fitted with the required safety, shut-off and pressure regulation equipment.

Shut-off valves and pressure regulators are not parts of the measuring device and are not included in the scope of delivery.

The piping and safety devices must be installed in accordance with the applicable general rules and the specifications in this manual.

When setting the pressures, observe section [2.5 Safety information about gases and pressures](#) (p. 28)

After completion of the entire installation, when all gas and waste gas lines have been connected and pressurized, a leak test must be performed.

Since the test cannot be carried out on all parts when the device is switched off, the leakage test for these parts must be carried out first or made up for when the instrument is running.

Please note the section [10.3.3 Check the tightness of the installation](#) (p. 261)

## 5.4.1 Fluid interfaces

GasLab Q2 has 2 gas inlets and two gas outlets, each of which is protected by a flame arrester. Two breathing points are used to enable atmospheric pressure equalisation between the inside of the device and the environment. An overview of all gas inlets and breathing elements is shown in the following figure:

No.	Connection	Position on the device
1	Process gas (PG) with integral particulate filter to act as a frit in the gland <b>Inlet pressure (gauge):</b> from 0.15MPa $\pm$ 21.76psi $\pm$ 1.5bar to 0.3 MPa $\pm$ 43.51psi $\pm$ 3bar	
2	Calibration gas cylinder (CAL) Operational calibration gas (CH <sub>4</sub> + CO <sub>2</sub> ) <b>Inlet pressure (gauge):</b> from 0.15MPa $\pm$ 21.76psi $\pm$ 1.5bar to 0.25MPa $\pm$ 36.26psi $\pm$ 2.5bar	
3	Outlet from integrated bypass Flow rate up to around 300 l/h $\pm$ 0.3 m <sup>3</sup> /h $\pm$ 10.59ft <sup>3</sup> /h (if necessary)	
4	Outlet from sensor path Typical flow rate 1.059ft <sup>3</sup> /h $\pm$ 0.03m <sup>3</sup> /h $\pm$ 30l/h Max. flow rate 2.118ft <sup>3</sup> /h $\pm$ 0.06m <sup>3</sup> /h $\pm$ 60l/h	
5	Main breather with 1/4" NPT connection thread for the possibility to connect a total separated vent line.	
6	Auxiliary breathers (on the reverse) Pipeline connection not possible and not required	

Fig. 5-2: Definition of fluid connections

The gas connections are always equipped with Swagelok or compatible compression tube fittings. In standard version, 6 mm fittings are used. Inlets can alternatively be fitted with 3 mm fittings. Likewise, the fittings can be ordered in 1/4" or 1/8".

The process gas connection (bottom left) has an internal particle filter, which serves only as device protection and is not a replacement for a primary filtration system. The right gas inlet is used to connect the operating calibration gas or particle-free test gases.

### **The inlet pressure must not exceed the engraved maximum pressure at any inlet**

The gas outlets are used to convey measured gases and the gas from the bypass into a vent line. Details of the vent line in the next section.

The breathing elements must not be closed or blocked, e.g. by water, condensation, ice, insects, dirt or similar, as otherwise the required pressure compensation is impaired.  
 ⇨ [2.6 Handling explosion-protection devices](#) (p. 30)

## 5.4.2 Connect the vent gas line



### **DANGER of Explosion due to non-functioning or incorrectly installed vent gas line**

Vent gas lines must be vented atmospherically and protected from dirt and moisture. These lines must be routed to a safe area away from GasLab Q2, as flammable gas flows through them permanently.



### **DANGER d'explosion dû à une tuyauterie d'échappement non fonctionnelle ou mal installée.**

*Les conduites de gaz d'échappement doivent être évacuées par voie atmosphérique et protégées de la saleté et de l'humidité. Ces conduites doivent être acheminées dans une zone sûre, à l'écart du GasLab Q2, car elles sont traversées en permanence par du gaz inflammable.*

The gas outlets of the device are connected to the vent lines via a 6 mm Swagelok or compatible connector (alternatively 1/4"). These must discharge the gases without back pressure. The inside diameter (at least 4 mm  $\pm$ 0.158 inch) must never be tapered!

The minimum internal diameter is 12 mm (1/2") for long lines or manifold lines. The vent line must be laid separately, at least 1m  $\pm$ 3.28ft (3 m  $\pm$ 9.84ft recommended). If the bypass has a high flow rate, it should preferably be equipped with a separate vent (waste) gas line to prevent return effects. Contact Honeywell in case of deviating exhaust gas conditions.



### **PROHIBITION Operation without bypass, unless the bypass outlet is closed by a gastight blanking plug and the needle valve on the left side of the device is also closed.**

*INTERDICTION Fonctionnement sans dérivation, à moins que la sortie de dérivation ne soit fermée par un bouchon d'obturation étanche au gaz et que le robinet à pointeau situé sur le côté gauche de l'appareil ne soit également fermé.*

### **Connect the vent gas line:**

- 01 Remove the transport protection from the gas outlets.
- 02 Connect the vent lines directly to the respective outlets. Prevent the dirt from entering the device.

The optional line on the breather is not part of the vent gas system and must never be connected to other lines! Observe the notes in section ⇨ [2.6 Handling explosion-protection devices](#) (p. 30).

Since no tightness test can be carried out when the device is switched off, the vent line must be checked for leaks with a gas leak detector immediately after commissioning.  
⇒ [Check the tightness downstream device](#) (p. 262)

### 5.4.3 Connect the process gas line

Prerequisite: The process gas from the process line (pipeline) is provided according to specification via the tapping equipment with temperature equalization system and pressure regulator.

Refer to ⇒ [11.3 List of suitable gases and calibration gases](#) (p. 285)

For this purpose, additional shut-off devices, further pressure reductions, filter system, gas dryer, etc. were installed on site and provided in the pipeline.

If an automatic verification measurement is to be carried out via the process gas inlet, an additional automated 3-way valve must be installed in the gas flow.

#### **Prepare the process gas sampling line connecting the device**

- 01 Ensure that the shut-off valve in the process gas pipeline is closed! If there is a pressure regulator, it must be set to its lowest setting! (Pressure regulators and shut-off valves are not equipment parts and are not included in the delivery; make sure you use types that comply with the specifications and standards)
- 02 Check whether the pressure and other parameters are correct and connect the end of the line intended for the device connection to the vent gas properly using a hose.
- 03 Carefully open the shut-off valves to create a permitted gas flow above the operating conditions. Then flush for around 30 to 45 seconds to clean the pipeline system. For very long lines you must extend this time accordingly.
- 04 Close the line shut-off again. Set the process gas pressure to a valid value, do not exceed the maximum pressure! (The exact pressure will be set later).
- 05 The pipeline is now ready for connection to the device. Prevent the penetration of dirt and moisture if the connection is not made immediately.
- 06 Remove the protection (sealing stopper/ sealing screws) from the (PG) device inlet and connect the gas line for the process gas. Observe the information in section ⇒ [5.4.1 Fluid interfaces](#) (p. 67)
- 07 Carefully open all the shut-off valves in the gas path so that the gas is present at the device inlet
- 08 Check the tightness of the process gas path from the source to the device. Refer to the section. ⇒ [10.3.3 Check the tightness of the installation](#) (p. 261)

## 5.4.4 Connect/replace calibration-, verification- gas cylinders

For proper operation of the instrument, regular automatic calibration / adjustment with a calibration gas is necessary. A gas bottle with a binary mixture of methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>), , must be connected to the instrument for this purpose. A suitable pressure reducer is required for this purpose, if not already available. Honeywell offers prefabricated panels with the high pressure reducers for this purpose.

Some situations make it necessary to connect additional gas cylinders, e.g. a verification measurement or service calibration.

This work must be performed for both **fluidic installation** and **maintenance**. For further details see ⇨ [10.4.1 Connect/replace calibration-, verification- gas cylinders](#) (p. 273)

Check the tightness before use the gas cylinder ⇨ [10.3.3 Check the tightness of the installation](#) (p. 261)

## 5.5 Opening and closing GasLab Q2

To perform the electrical installation and for subsequent maintenance work, the device has to be opened and closed again.

### 5.5.1 Opening GasLab Q2



#### PROHIBITION INTERDICTION!

- OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT  
*OUVRIER EN PRÉSENCE D'UNE ATMOSPHÈRE EXPLOSIVE*
- OPENING BEFORE DISCONNECTING THE POWER SUPPLY  
*OUVERTURE AVANT LA DÉCONNEXION DE L'ALIMENTATION ÉLECTRIQUE*
- Opening without the permission and consent of the system operator.  
*Ouverture sans l'autorisation et le consentement de l'opérateur du système.*
- Opening in the absence of conditions according to ISO / IEC61010-1\*.  
*Ouverture en l'absence de conditions conformes à la norme ISO / IEC61010-1\*.*

\* Controlled conditions according to the ISO / IEC61010-1 prevail, namely temperature +5 °C (+41 °F) to +40 °C (+104 °F); humidity up to 80% at +31 °C (+88 °F), linearly decreasing to 50% at +40 °C (+104 °F) (usually these are residential and office conditions). In case of doubts, contact Honeywell.

### Prerequisite(s)

- Permission and consent from the system operator to open installed equipment is available in writing.
- Explosive atmosphere is not present.
- Voltage is switched off.
- Conditions according to ISO / IEC61010-1 are given.
- An authorized person (calibration officer) is present if required by the regulations of your country, and the measurement task of the instrument.

### Steps

- 01 Mark your work on the switched off supply voltage and secure it against being switched on again!
- 02 Monitor the environment for the presence of an explosive atmosphere, e.g., with a gas leak detector, continuously during the entire process.

**DANGER****EXPLOSIVE ATMOSPHERE *ATMOSPHÈRE EXPLOSIVE*****Damage to health and property (explosion) possible*****Possibilité d'atteinte à la santé et aux biens (explosion)***

Stop work immediately if an explosive atmosphere occurs!

*Arrêtez immédiatement le travail en cas d'atmosphère explosive !*

- 03 Screw in the locking screws ⇒ [5.5.3 Securing the detachable parts for opening the housing](#) (p. 73).
- 04 Unscrew and remove the lid and/or housing cylinder counterclockwise without tools. If the lid and /or housing cylinder cannot be turned, contact our technical support ⇒ [12.1 Technical support Flow Computers and Gas analyzers](#) (p. 290)

The inside of the device is accessible.

**Handle with care and caution as sensitive parts are contained here.**

**Prevent electrostatic discharge e.g. with ESD wrist strap according to EN 61340-5-1.**

## 5.5.2 Closing the housing of Gaslab Q2

### Prerequisite(s)

- Work on the opened device has been completed.
- An authorized person (calibration officer) is present if the regulations of your country and the measuring task of the device require this.
- Device as well as sensor and signal lines are sealed according to the conditions of the applicable authorization, if necessary, e.g. when it is used within the scope of legal meteorology.

### Steps

- 01 Screw in the lid and/or housing cylinder clockwise to the stop, without tools.
- 02 Unscrew the locking screws to protect the lid and/or housing cylinder from unintentional opening ⇒ [5.5.3 Securing the detachable parts for opening the housing](#) (p. 73)
- 03 Check the effectiveness of the locking screws, if movement of the secured parts is still possible, unscrew the screws further and check mobility again. If you are unsuccessful, contact our technical support. ⇒ [12.1 Technical support Flow Computers and Gas analyzers](#) (p. 290)

When the device is properly closed, remove the work notice on the supply voltage Turn on the supply voltage and all gases to start operation.

### 5.5.3 Securing the detachable parts for opening the housing

All parts that can be unscrewed to open the housing are protected against unintentional opening by locking screws.



To open / unscrew, screw the locking screws shown in the following figure into the basic housing

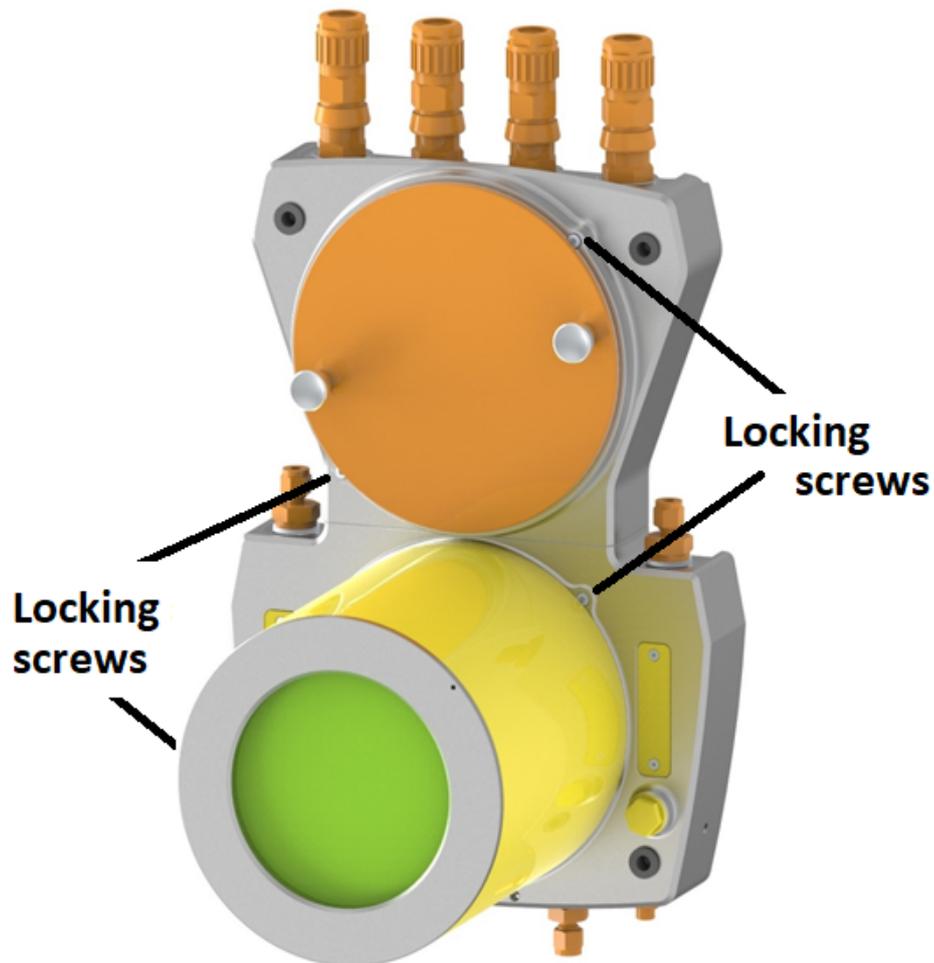


Fig. 5-3: Locking screws



At the end of installation or maintenance, unscrew the locking screws tightly against the cover or hood which has been screwed back on.

## 5.6 Electrical installation

Before starting work, make sure that you observe the general safety rules. Also observe and follow the information in section → [2 Safety information \(EN-US-FRA\)](#) (p. 17). Especially in potentially explosive atmospheres use a gas leak detector when working on the device and make sure that it is voltage-free (supply and signals) before any change of the wiring. It is essential that you follow the instructions.



### PROHIBITION

Carrying out the work described in the section without the required instructions by the manufacturer or his authorized representatives and the permission of the plant operator.

### INTERDICTION

*D'effectuer les travaux décrits dans la section sans les instructions requises par le fabricant ou ses représentants autorisés et l'autorisation de l'exploitant de l'installation.*

The local / national installation guidelines (e.g. EN 60079-14) must be observed for all work. A functioning effective lightning protection must exist at the place of use and the device must be connected to the equipotential bonding or earth. An external switch-off device must be installed near the device by the system operator.

Above all, the following sections are important:

- ⇒ [2.2 Place of use environmental conditions and installation](#) (p. 22)
- ⇒ [2.7 Electrical safety information](#) (p. 34)
- ⇒ [2.7.1 Disconnecting device and cables](#) (p. 36)
- ⇒ [2.7.2 Conduit systems and cable glands](#) (p. 38)



### DANGER Lost of explosion protection due to incorrect installation of the cable glands

The installation is relevant to explosion safety! Care must be taken to ensure safe and proper installation.



### DANGER Perte de la protection contre les explosions en raison d'une installation incorrecte des presse-étoupes.

*L'installation est pertinente pour la sécurité contre les explosions ! Il faut veiller à ce que l'installation soit sûre et correcte.*

The manufacturer therefore only accepts responsibility for cable glands made by him or on his behalf.



The device is protected against polarity reversal. The device will not work if the connections have been reversed.

## 5.6.1 Power supply and electric protection

The power supply must comply with section [⇨ 2.7 Electrical safety information](#) (p. 34). Note the following in this context:

- The 24 V (DC) power supply must have reinforced insulation and be safely isolated from other mains. Fluctuations, including mains fluctuations:  $\pm 15\%$ . It must be possible to supply a rating of up to 96 W. Generated e.g. with Quint-PS-100-240AC / Quint-PS24DC / 24DC / 10 / Siemens PSU / Siemens logo or equivalent power supplies
- Only one device may be operated at a voltage supply.
- The overvoltage/current protection and electrical line protection must be ensured by the power supply. Suitable external safety devices must shut down a current of 8.3 A or over within 120 seconds, thus limiting the power supply.



**The device has no user replaceable guards, it will not work if the internal protective equipment has tripped.**

**This protective equipment (thermal trips and electrical fuses) must be changed by authorized specialists.**

**If the internal guards have tripped, refer to**

**⇨ [9.4 Correct electrical faults](#) (p. 251)**

**or contact**

**⇨ [12.1 Technical support Flow Computers and Gas analyzers](#) (p. 290)**

Check the input voltage, at the location of use, for accuracy and usability according to the following data:

- Voltage range: 24 V DC. Including mains fluctuations  $\pm 15\%$ , Power supply units with safe electrical isolation.
- An external safety device which shuts down within 120 seconds is installed. (The shut-down current is 200/Supply voltage. The tripping properties depend on the ambient temperature. This must be taken into account if the temperature is significantly higher than room temperature.)
- Rating of up to 96 W can be supplied.

## 5.6.2 Cables (power supply / communication)

For the connection between the instrument and other instruments different control and signal cables are suitable, the choice depends on the requirements at the place of use.



Cables and wires are standard products (not from the manufacturer) which are necessary to operate the device. It is recommended to disconnect the data cables from the power supply cable.

Generally, the connection cables can be routed to 2 separate locations without additional ex-rated junction boxes. The insulation must at least comply with flammability class 1. Use screened cables. The screen on the connection cable must be connected in compliance with local regulations.



### DANGER

#### Unsuitable cables

Dangerous situations can arise

Cables shall be suitable for + 80°C  $\triangleq$  176°F.



### DANGER

#### *Des câbles inadaptés*

Des situations dangereuses peuvent survenir

Le câble doit être adapté à + 80°C  $\triangleq$  176°F.

The connection terminals are suitable for conductor cross-sections from 0.25 mm<sup>2</sup>  $\triangleq$  24 AWG to 2.5 mm<sup>2</sup>  $\triangleq$  14 AWG. Signal cables require conductor cross-sections of  $\geq$  0.25 mm<sup>2</sup>  $\triangleq$  24 AWG. We recommend signal cables with a conductor-to-conductor capacity of less than 120pF/m  $\triangleq$  36.58 p S<sup>-1</sup>/ft and an inductance of less than 0.7  $\mu$ H/m  $\triangleq$  0.213  $\mu$  $\Omega$ s /ft.

The number of cores varies depending on the application, whereby the cores should be twisted into pairs and screened jointly. The maximum cable length depends on the type of signal and must not be exceeded. A cable type of category 5 (Cat 5) is recommended for data communication links via Ethernet.

Cables or cores are fed into the device via cable glands. See also the next section. The relevant installation guidelines must be obeyed for routing the cables!

### 5.6.3 Grounding and potential equalisation



**DANGER due to inadequate grounding of the device**  
**DANGER en raison d'une mise à la terre inadéquate de l'appareil.**

Unsafe situations can arise electric shock is possible. *Des situations dangereuses peuvent survenir ; un choc électrique est possible*

The housing must be electrically connected to the local earth and the equipotential bonding. For this purpose, the equipotential bonding connection point (PA) marked GROUND on the bottom of the housing next to the calibration gas inlet must be used.

*Le boîtier doit être relié électriquement à la terre locale et à la liaison équipotentielle. Pour cela, il faut utiliser le point de connexion de la liaison équipotentielle (PA) marqué GROUND sur le fond du boîtier à côté de l'entrée du gaz d'étalonnage*

The conductor cross-section for grounding is least 6 mm<sup>2</sup>  $\cong$  10 AWG (maximum 10 mm<sup>2</sup>  $\cong$  8 AWG) copper conductor. The specified ground connection must be used with no modifications. The torque for the connection must not exceed 3.5Nm  $\cong$  2.582 ftlb. If GasLab Q2 is mounted on a metal plate, the plate must be properly included in the grounding and the equipotential bonding system.

Use the appropriate connections or install such connections. There is another functional earth point (FE) in the connection box, see following figure.

The device will only operate correctly if all the system parts have the same grounding potential. Before making any further cable connections, ensure that this is permanently guaranteed. If potential differences are found, they must be rectified by the system operator by taking appropriate measures, giving due consideration to explosion protection  $\rightarrow$  [2.1 Intended use](#) (p. 19).

The screens on the supply and communication cables must be connected in compliance with explosion-protection regulations (for example, EN 60079-0; EN 60079-14) and local regulations.

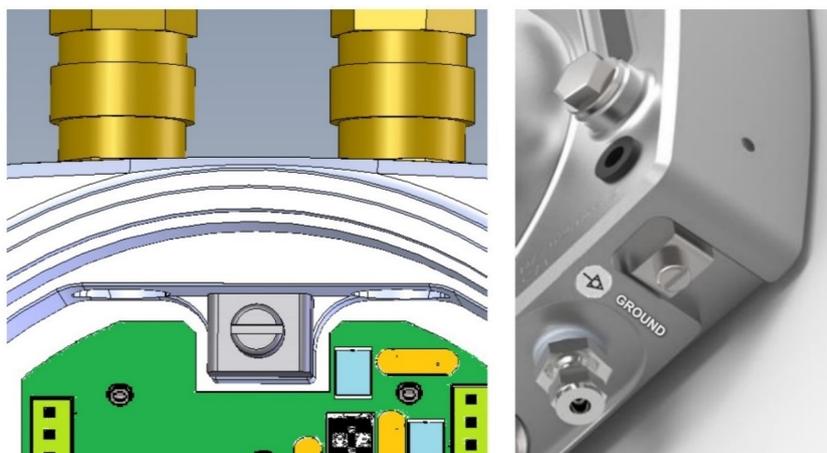


Fig. 5-4: Grounding inside connection box (FE) and outside of the device (PA)

## 5.6.4 Cable glands (adapter / dummy plugs)

On the upper side of the Q2 are four threaded holes with M20x1.5 thread. These can be fitted as required. Possible are dummy plugs, adapters (1/2"NPT thread) or cable glands like shown in the example below. Used are standard products (not from the manufacturer) which are necessary for the operation of the Q2.

The screw-in parts used must comply with the specifications at the place of use.



### NOTICE AVIS

Use in USA requires NEC compliant and use in Canada requires CEC compliant cable entry devices. For use in Japan, only JPEX listed glands may be used Contact Honeywell for types.

*L'utilisation aux États-Unis nécessite des dispositifs d'entrée de câbles conformes à la norme NEC et l'utilisation au Canada nécessite des dispositifs d'entrée de câbles conformes à la norme CEC. Pour une utilisation au Japon, seuls les presse-étoupes répertoriés JPEX peuvent être utilisés. Contactez Honeywell pour connaître les types.*

The correct IP class (IP 64 or better / higher) must also be observed. An operating temperature range up to 80°C  $\pm$  176°F  $\pm$  353K must be covered. Appropriate Ex-certifications (II2G Ex db IIC T4 Gb) must also be provided for these parts.



Fig. 5-5: Position of the cable glands

Most applications require only 2 cable glands, one for the data transfer cable and one for the power supply (24 V DC). The remaining holes provide access for further signal cables if required. Select a suitable type of cable gland depending on the location and requirements, contact Honeywell if necessary.

In order to maintain the specified explosion protection, the screw-in parts must be installed and cast in accordance with the gland manufacturer's specifications. Compliance with the IP rating may require the use of sealing rings.

**Openings which are not required must be fitted with appropriate dummy plugs.**



**DANGER due to incorrect cable entry devices.**  
**DANGER en raison de dispositifs d'entrée de câbles incorrects.**

The cable entries must meet or exceed the IP rating (IP 64). Depending on the type, additional sealing rings and washers must be used.

*Les entrées de câbles doivent être conformes ou supérieures à l'indice IP (IP 64). Selon le type, des bagues d'étanchéité et des rondelles supplémentaires doivent être utilisées.*

The required accessories listed below are supplied in the recommended or ordered version.

<b>List of cable glands and dummy plugs recommended by Honeywell (all threads M20x1,5):</b>				
<b>Type of dummy plug</b>			<b>Enclosure</b>	<b>Order number</b>
Redapt PA-D brass stopping plug type 'A'			Ex db IIC	PA-D-1-0-04-00
<b>Type cable gland Hawke ICG 653/UNIV</b>	<b>Enclosure</b>	<b>Number of cores*</b>	<b>Cable diameter (mm)</b>	<b>Order number ICG 653/UNIV...</b>
Cable gland, pressure-resistant (can be sealed with sealant**), and screen connection	Ex d IIC	6/12	5.5 to 12	...Os M20 Brass
		6/12	9.5 to 16.0	...O M20 Brass
		10/15	12.5 to 20.5	...A M20 Brass
		6/12	9,5 bis 16,0	...O M20 Brass
		10/15	12,5 bis20,5	...A M20 Brass

\* High number of cores for ATEX and IECEx only; low number of cores for all other certificates

\*\* To comply with the specified explosion protection, the cable gland must be sealed as specified by the cable gland manufacturer

#### Alternativ screw-in parts for use in Japan

EX CABLE GLAND MODEL SFLU 10-M

EX CABLE GLAND MODEL SFLB/T 10-M

EX BLANKING ELEMENT PLUG-M10/M25/M32

Furthermore, many variations are possible, such as the use of tubes and individual wires or conduit stop boxes if they are sealed or potted.

Under FM conditions these must be sealed within 18" (45cm). For ATEX and IECEx this distance is 1xD from the enclosure as for a normal cable gland. Contact Honeywell if you wish to deviate from the standard equipment.

If cable glands and dummy plugs are not pre-assembled on the device, the following applies with regard to assembly and replacement:

- Treat the thread of the screw-in parts with threadlocker! For this purpose, apply Loctite 243, Loctite 511 or equivalent threadlocker to the thread flanks in the last third of the internal thread.

## 5.6.5 Electrical connection diagram and electrical interfaces (inputs and outputs)

The cables are connected to the board in the connection box via the plugs on the edge of the board. All electrical interfaces (galvanically isolated) are located here. The plugs are secured with snap-in hooks. The connections and interfaces are supplemented and explained in figures and sections.

Connection	Interface
TB1	Power supply (see also section ).
TB2	Future extension.
TB3	Ethernet connection 10/100 Mbit/s; (TCP/IP; Modbus TCP) electrically isolated, range: 100m $\pm$ 328.084 ft
TB4	RS485 port 1 and port 2 (Modbus serial) (electrical isolation), range: 500m $\pm$ 1640ft
TB5	Digital inputs 1 and 2 (2 cores each, electrically isolated) supplied by the device, max. 9 V to a potential-free contact or NAMUR sensor. e.g. process and calibration gas pressure monitoring
TB6	4 digital outputs (electrically isolated) common return cable (1 breaker closed when de-energized, suitable for general alarms, 3 makers) (circuit operates as a floating contact), max. 120 mA at 28.8 V (DC).
TB7	4 analog outputs 0/4...20mA (electrically isolated) common return cable; short-circuit-resistant; R max. = 390 $\Omega$



### PROHIBITION *INTERDICTION!*

- remove of the plug connection in the center of the connection board. (see next figure)  
*retirer la fiche de connexion au centre de la carte de connexion. (voir figure suivante)*



### Check that the connectors are secure!

#### Tighten the screws on any unused terminals!

Connect the cables and screens in compliance with the explosion protection regulations. In practice, the screens are not attached in explosion hazard areas, but are only connected in the safe area.

The possible electrical connections for the GasLab Q2 are shown in the following diagram:

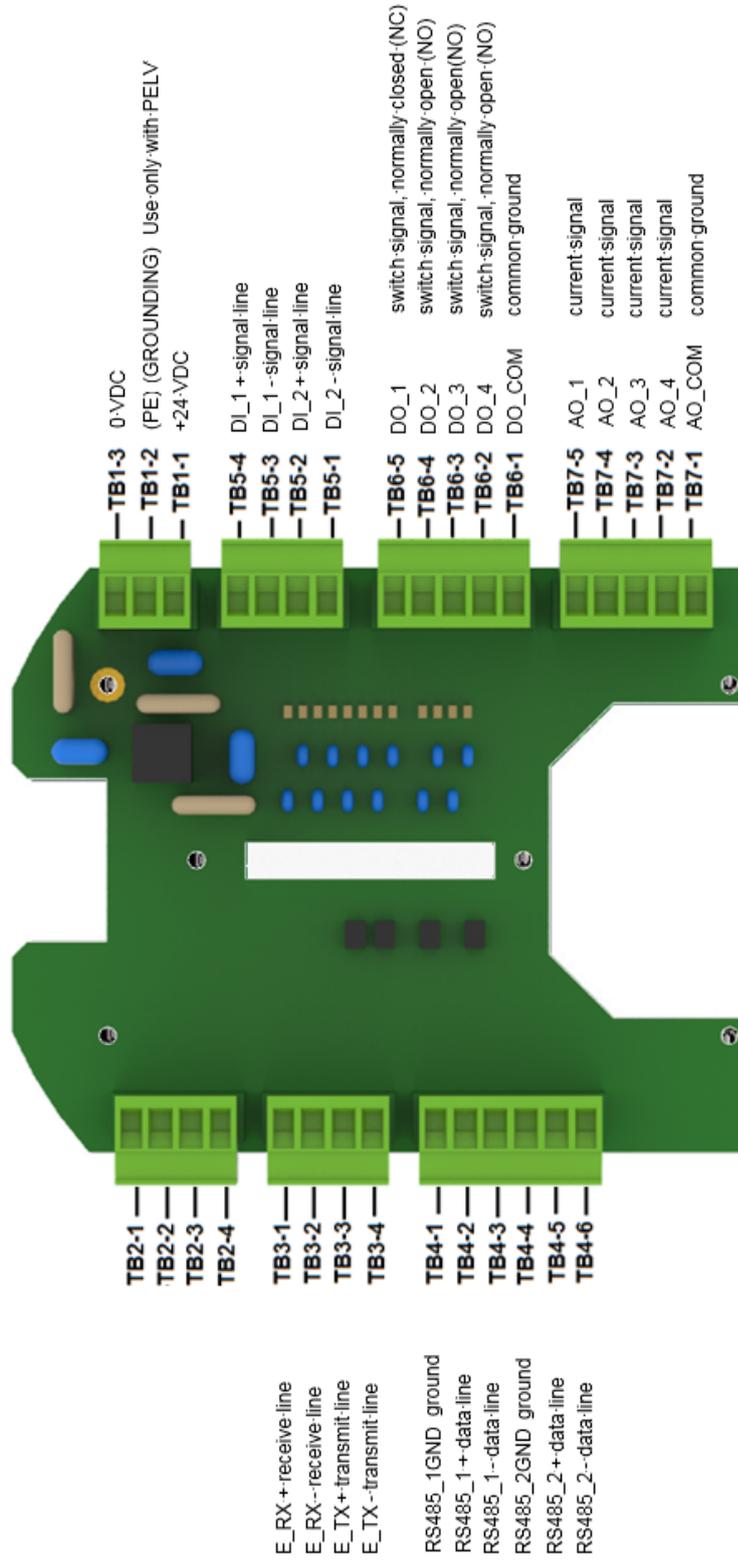


Fig. 5-6: Electrical connection assignment (circuit board)

## 5.6.6 Connection to other devices and system parts

The connection diagrams for sensors and devices to which the instrument can be connected are shown in example form in the following. This may require special parameterization in enSuite.



Detailed information on parameterization is available in section ⇒ [8.3 Notices about parameterization \(p. 228\)](#) and the online help. Only the minimally required settings are shown below in keywords

Regarding wiring, shielding / screening and grounding, the general industrial rules as well as the local conditions and regulations, e.g. EN 60079-0 and EN 60079-14, apply taking explosion protection into account.

The shielding of the cable serves to create a space free of external fields. Cable shields can best be imagined as a continuation of the housing. In order to better dissipate any interference that may occur, it is recommended that the shield be contacted as frequently and extensively as possible.

The following options for attaching the screen to the connection cable are possible as long as they do not breach explosion protection regulations

Options	Description
Two-sided attachment	<p>(It is extremely important and mandatory that there are no grounding potential differences between the end points of the shield.)</p> <p>Benefit: EMC-compliant connection is also effective against inductive coupling components</p> <p>Drawback: Compensating currents (ground loop formation), which flow through the screens should be prevented where possible and require appropriate action.</p>
One-sided attachment	<p>Benefit: Lower voltage with potential isolation in conjunction with low frequency signals No compensating currents and ground loop formation</p> <p>Drawback: Is only effective against capacitive couplings and only produces significant success if the screened circuit has no connection to the ground, at least on the cable side.</p>



### CAUTION Violation of explosion protection

### ATTENTION Violation de la protection contre les explosions

Risk of explosion *Risque d'explosion*

In order to comply with the specified explosion protection level, the cable connection in the gland must always obey the gland manufacturer's specifications. The isolation or surge (lightning) protection on the cables must be installed by the user, depending on the situation of use.

*Afin de respecter le niveau de protection contre les explosions spécifié, la connexion des câbles dans le presse-étoupe doit toujours obéir aux spécifications du fabricant du presse-étoupe. L'isolation ou la protection contre les surtensions (foudre) sur les câbles doit être installée par l'utilisateur, en fonction de la situation d'utilisation.*

## Ethernet connection



Ethernet can be used to connect to the device, access the remote control panel, retrieve information, send a new set of parameters to the device and start other device actions.

It is best to have an Ethernet cable pulled to a location outside the hazardous area, ending in a plug for RJ-45: This way you or a service person can always connect a laptop to the device.

The connection is made using the terminals designated TB3-1 to TB3-4 in the Q2 connection box. The core colors depend on the standard used, normally EIA/TIA 568B. The twisted pairs must not be untwisted or regrouped. The polarity of the cores within the core pair is unimportant and the core pairs can even be swapped.

For cable type refer to section → [5.6.2 Cables \(power supply / communication\)](#) (p. 76) length 100m ±328ft.

Core pair	Plug (pins)	Color EIA/TIA 568 B	Color EIA/TIA 568 A	Color IEC	Color REA	Color DIN 47.100	Terminal inside device
1	4 / 5	blue white/blue	+ blue white	+ white/+ blue	white+blue	white+brown	
2	3 / 6	white/green + green	white orange	+ red+orange	turquoiseviolet	green+yellow	TB3- 3 TB4-4 TB3-4
3	1 / 2	white/orange + orange	white +green	black+grey	white+orange	grey +pink	TB3- 1 TB4-2 TB3-2
4	7 / 8	white/brown + brown	white +brown	yellow+brown	turquoise+violet	blue + red	

The following drawing is only designed to illustrate the screening using an example.

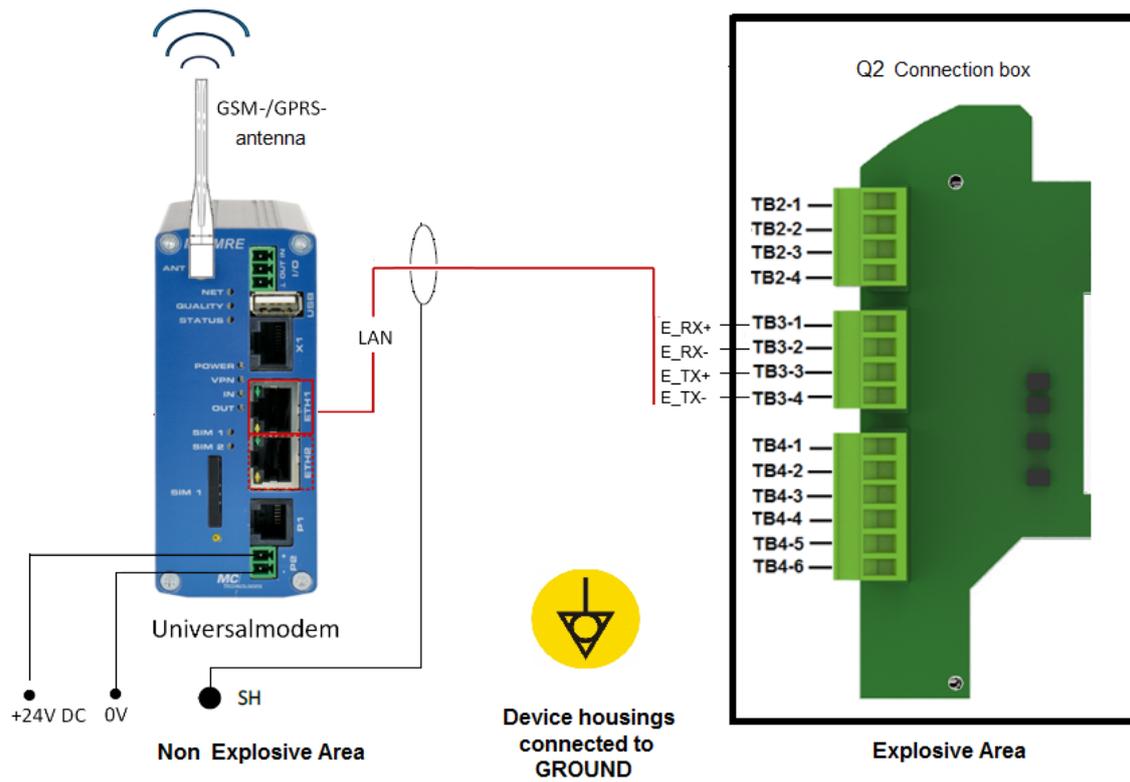


Fig. 5-7: Sample LAN/Ethernet connection (diagram)



Additional to the wiring, settings must be made before this interface can be used. See sections [7.3.9 System display I/O \(network settings / inputs/ outputs\)](#) (p. 141) or [8.2.1 SFB I/O \(IP address network- and I/O-settings\)](#) (p. 189)

## RS485 serial interface connection

Connections include, for example, other measurement devices, devices for final processing and evaluation, PLC systems, and so on. Cable type refer to section [5.6.2 Cables \(power supply / communication\)](#) (p. 76).

There are 2 interfaces (TB4-terminals 1 to 3 for CH1 and TB4-terminals 4 to 6 for CH2, details see figure). The connection varies depending on the device (see dotted cable in the following example). The ground (0 V) is either connected directly to the device/system or connected to GND.

Pull-up / pull-down resistors should be installed at the cable end near the data evaluation unit to generate the neutral potential. A  $470\ \Omega$  resistor must be connected between RSA and the positive supply voltage of the connected data evaluation unit. A further  $470\ \Omega$  resistor must be connected between RSB and GND. For cable lengths over 200 m  $\pm$  656ft, additional bus connection resistors of  $120\ \Omega$  each between RSA and RSB at the cable end at the data evaluation unit are recommended.

The following drawing is only designed to illustrate the screening using an example.

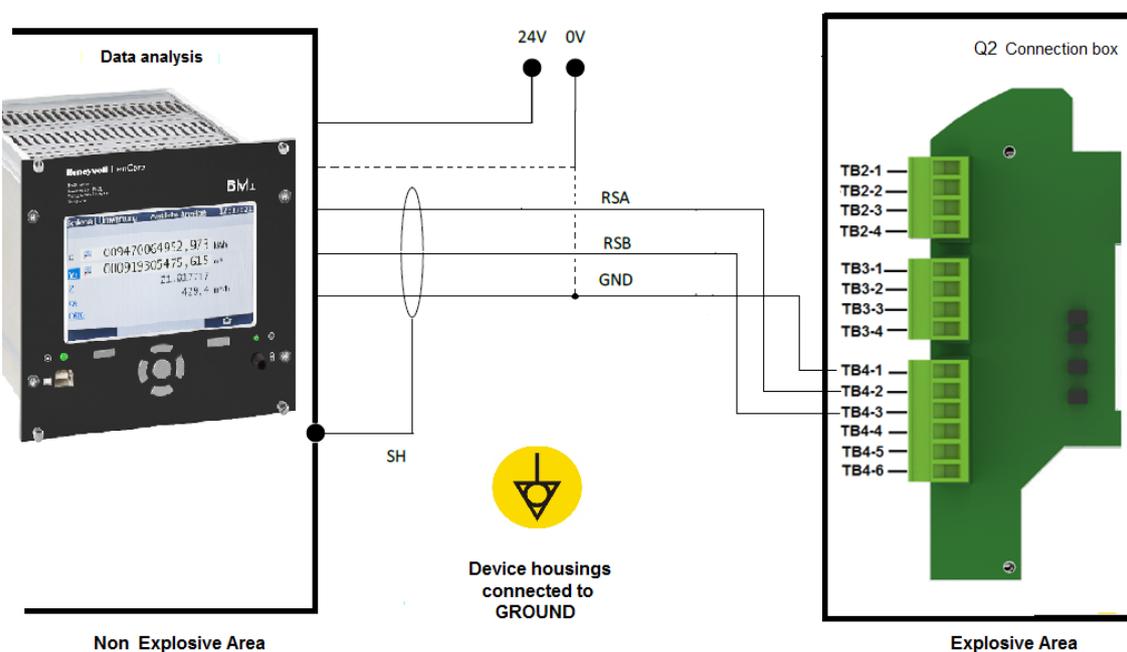


Fig. 5-8: Example of RS485 connection (diagram)



In addition to the wiring, various enSuite settings are required before this interface can be used. Refer to section [8.2.1 SFB I/O \(IP address network- and I/O-settings\)](#) (p. 189)

## Digital inputs

There are two electrically isolated inputs supplied in the connection box (TB5-terminals 1 to 2 and TB5-terminals 3 to 4, details see figure). The maximum supply voltage is approx. 9 V.

For cable type refer to section ⇨ [5.6.2 Cables \(power supply / communication\)](#) (p. 76)  
The figure also shows the appropriate terminals in the connection box. The wiring in the drawing is only designed to illustrate the screening using an example.

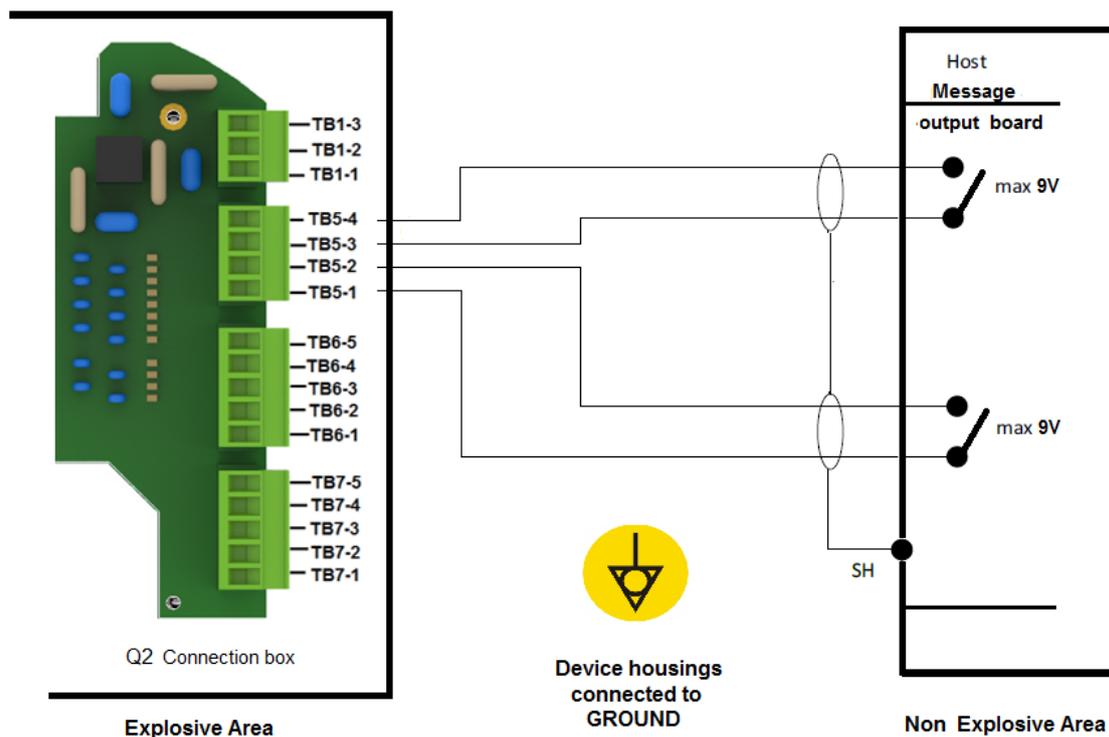


Fig. 5-9: Example connection of digital inputs



In addition to the wiring, various enSuite settings are required before this interface can be used. See ⇨ [8.2.1 SFB I/O \(IP address network- and I/O-settings\)](#) (p. 189). Then, just make a connection to a potential-free contact. The state of these inputs can be observed on the display and via enSuite using “Live values” function.

## Digital outputs

There are four digital outputs (electrically isolated passive output circuits) in the connection box (TB6-terminals, details see figure).

The output at TB6-5 is a breaker (NC, “normally closed”), the other outputs are makers (NO, “normally open”). Output DO1 is an NC contact (terminal TB6-1) and output DO2 is a NO contact (terminal TB6-3).

The maximum load per channel is 28.8 V DC/120 mA. The maximum pulse rate is 25 Hz.

Cable type refer to section ⇒ [5.6.2 Cables \(power supply / communication\)](#) (p. 76) the maximum length is 250m ±820ft. The figure also shows the appropriate terminals in the connection box. The wiring in the drawing is only designed to illustrate the screening using an example.

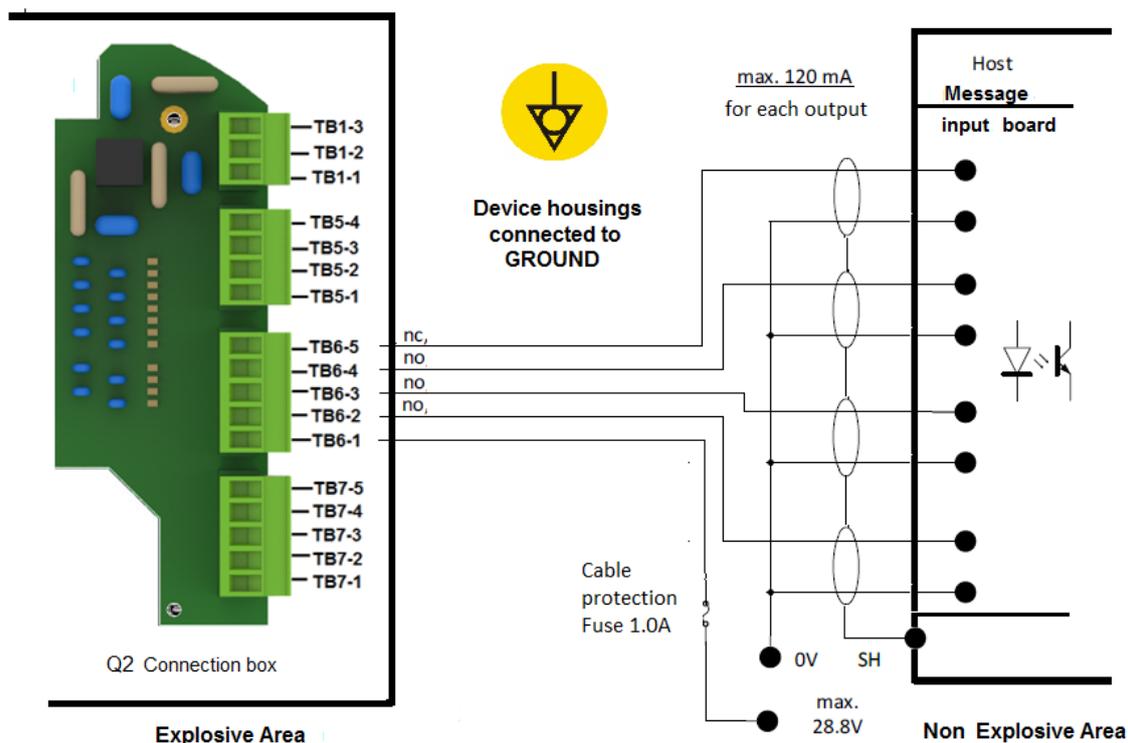


Fig. 5-10: Example connection of digital outputs



These outputs act like a potential-free contact to a common point. This common point is usually used as common supply (usually +24 V). If configured that way and a channel is switched ON, the corresponding pin switches to +24 V. In addition to the wiring, various enSuite settings are required before this interface can be used. Refer to section ⇒ [8.2.1 SFB I/O \(IP address network- and I/O-settings\)](#) (p. 189). The state of these outputs can be observed and manually set by setting these outputs into “Test mode” on the display.

## Analog outputs

There are four common electrically isolated active output circuits (“common ground”/short-circuit-resistant) with 0 or 4 to 20 mA in the connection box (TB7-terminals, details see next figure). The maximum supply voltage is around 9 V. The maximum load is 390  $\Omega$ .

Cable type refer to section [⇨ 5.6.2 Cables \(power supply / communication\)](#) (p. 76) the maximum cable length is 500m  $\approx$  1640ft. The figure also shows the appropriate terminals in the connection box. The wiring in the drawing is only designed to illustrate the screening using an example

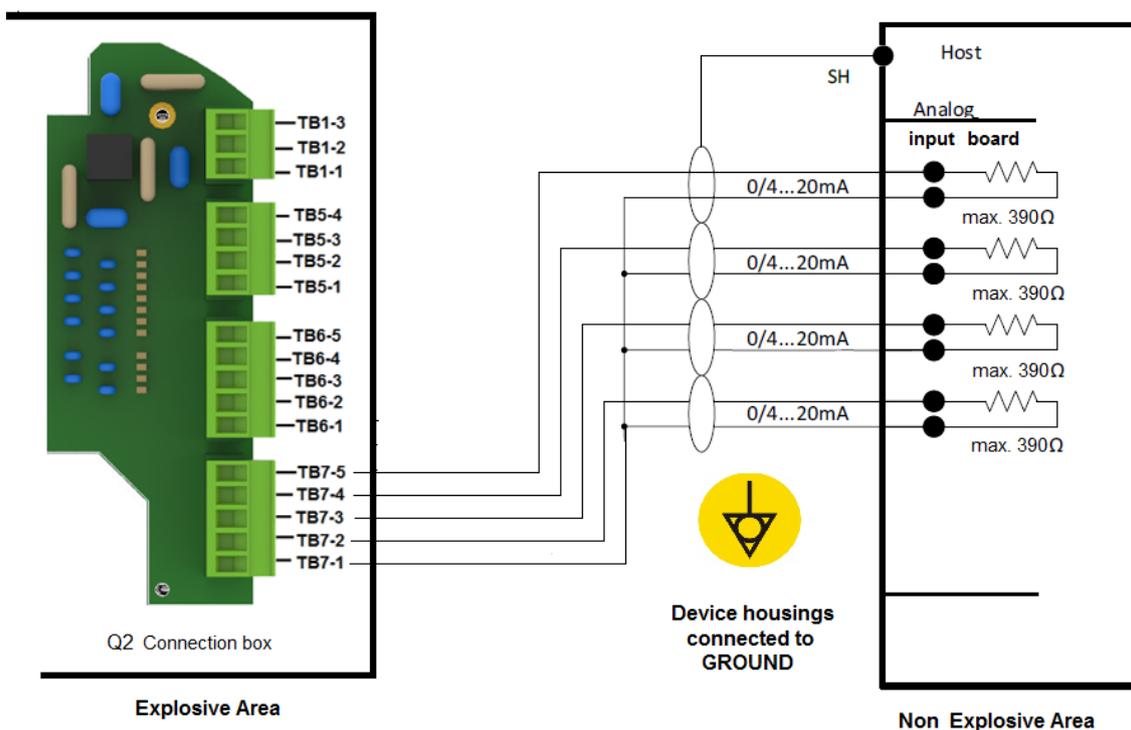


Fig. 5-11: Sample connection of digital outputs



In addition to the wiring, various enSuite settings are required before this interface can be used. Refer to section [⇨ 8.2.1 SFB I/O \(IP address network- and I/O-settings\)](#) (p. 189).

## 5.6.7 Electrical device test to verify correct installation

After completion of the electrical work, you should conduct a test to eliminate the possibility of errors, e.g. insulation faults in the supply voltage and communication.



### PROHIBITION INTERDICTION

- to conduct the tests in a potentially explosive atmosphere.  
*de réaliser les essais dans une atmosphère potentiellement explosive.*
- to conduct the tests without the permission of the system operator  
*d'effectuer les essais sans l'autorisation de l'exploitant du système.*

The use of a multimeter is required to conduct the test. You should check the following points:

- 01 ⇨ [5.5.1 Opening GasLab Q2](#) (p. 70) Conduct a visual inspection of the interior of the device. There must be no loose wires. All wires are connected as shown in the circuit diagram. Spare wires have been dealt with correctly and routed safely.
- 02 The supply voltage is 24 V DC. ± 15% is available after switching on the terminals on the Terminal Board.
- 03 The power supply capacity is sufficient for the maximum device requirement (see type plate). If necessary, connect a load resistor in parallel to achieve this value.
- 04 Cause a short-circuit and the supply voltage must be switched off within 120 seconds.
- 05 Check all switches and fuses outside the device. Is everything accessible and can everything be switched off and on?
- 06 Conduct resistance measurements to ensure that all the electrical connections have low resistance. Check the earthing as well.
- 07 Conduct resistance measurements to ensure that all the cables are adequately isolated from each other and to earth.

If you find any discrepancies or errors during the check, eliminate them and repeat the corresponding points of the installation procedure until all points are error-free and OK. This completes the installation work. Then close the device properly. ⇨ [5.5.2 Closing the housing of Gaslab Q2](#) (p. 72)

## 6 Commissioning and decommissioning



### PROHIBITION INTERDICTION

Carrying out the work described in the section without  
*D'effectuer les travaux décrits dans la section sans*

- the required instructions by the manufacturer or his authorized representatives.  
*les instructions requises par le fabricant ou ses représentants autorisés.*
- the permission of the plant operator.  
*l'autorisation de l'exploitant de l'installation.*

Refer allways to the regulations for explosion protection and the safety information, particularly for starting up the device in a potentially explosive atmosphere.

The commissioning procedure may only be carried out by qualified technician or field service personnel. Honeywell can provide training and commissioning services.

Before commissioning, make sure that Section [⇨ 2 Safety information \(EN-US-FRA\)](#) (p. 17) have been observed and followed and that the instrument has been installed and connected in accordance with this document.

All newly delivered devices already have a factory parameterization. This default parameterization should usually be sufficient; if necessary, fine-tuning may be required in the field and some parameters may need to be adjusted via the software, such as the calibration gas properties.

If you are not familiar with the operation and software of the instrument, read the appropriate information in section

[⇨ 7 GasLab Q2 operation panel and operation](#) (p. 103) and [⇨ 8 Configuration and analysis software enSuite](#) (p. 169)

## 6.1 Commissioning preparations and requirements

The following points must apply:

- The upstream sample handling and conditioning system must be operating properly, providing the correct pressure to the device, and at its operating temperature.
- An operational calibration gas cylinder is correctly connected. The composition of the gas mixture is programmed into the device.
- Delivery is less than 1 year ago, (battery charge above 20%). If you are unsure check according to hints in section ⇨ [Info display \(Device monitor\)](#) (p. 119) or have the battery replaced as a precaution.
- The device is installed and fully closed.
- There is no moisture condensation inside the device. If in doubt, remove the covers (see next section) and allow the appliance to dry for at least 12 hours; or contact Honeywell.
- Power supply and communications are carried out properly and is available.

### 6.1.1 Set date and time

First set the current date and time as well as the timezone of the location. Activate daylight saving time if applicable.



#### Information about the procedure

- ⇨ [7.3.5 System display Time Service \(System time and date\)](#) (p. 126)
- ⇨ [8.2.3 Time service SFB settings and system time action](#) (p. 193)

## 6.1.2 Set password for Administrator (admin1) and generate a new TLS certificate

### Background

The access data is always checked in the device, i.e. the user must have been created in the device.

In the delivery state, user passwords for standard users are empty for all enCore devices, including **admin1**.

To increase security, we recommend creating passwords for **admin1** and all existing users during commissioning and implementing a role-based authorization concept.



#### NOTICE AVIS

##### Lack of password protection *Absence de protection par mot de passe*

Access to the device is possible for unauthorized persons.

*L'accès à l'appareil est possible pour les personnes non autorisées.*

Assign passwords for administrator and all main users during commissioning and create a role-based authorization concept.

*Attribuez des mots de passe à l'administrateur et à tous les utilisateurs principaux lors de la mise en service et créez un concept d'autorisation basé sur les rôles.*

The enCore device uses a self-signed TLS-certificate to authenticate itself to enSuite each time a connection is established. This certificate is created when the enCore device is put into operation.

Delete the TLS certificate on the enCore device (if already exist) and having the device generate a current one with administrator and user passwords set up.



#### Further details:

- ⇒ [Info display \(Serial number and TLS certificate\) \(p. 116\)](#)
- ⇒ [7.3.6 Display and operation \(p. 132\)](#)
- ⇒ [8.2.5 User and rights management \(p. 201\)](#)

## 6.1.3 Adapting the factory parameterization

In the factory parameterization (default parameter set), usually only calibration gas properties, automatic calibration intervals and the purging / flushing times for the gases must be adjusted. For extreme ambient conditions, the setting for the auxiliary housing heater or the fan is still required.

The default parameter set automatically switches on the additional heating system at  $0^{\circ}\text{C} \cong 32^{\circ}\text{F} \cong 273\text{K}$  with a switching hysteresis of  $2^{\circ}\text{C} \cong 3,6^{\circ}\text{F} \cong 2\text{K}$ . This supplementary heater function is only available up to a maximum housing temperature of  $+ 13^{\circ}\text{C} \cong 55^{\circ}\text{F} \cong 286\text{K}$ .

Other parameters are normally left at their factory-set values and, if necessary, supplemented by customer-specific requirements.

To understand these parameters and to change their values if necessary, please refer to section [8 Configuration and analysis software enSuite](#) (p. 169) as well as to [enSuite online help](#) (p. 173)

## 6.1.4 The hardware parameter guard (SSW)

You can (and must for fiscal use) protect settings which affect the measuring properties. This is done with the Security Switch (short: SSW) also called calibration switch. It ensures that fiscally relevant changes can only be made with the SSW opened or are logged in the audit trail.

To open or close the SSW, the device must be opened. Follow the procedure from ⇨ [5.5.1 Opening GasLab Q2](#) (p. 70)

Always keep in mind:

- never open the housing in the presence of an explosive gas atmosphere and with out the permission of manufacturer and system operator
- The inside of the device contains sensitive parts that can easily be damaged proceed with the appropriate care.

### Use of hardware parameter protection (SSW)

The SSW is closed or opened by attaching a bridge (jumper) see the following figure, view from below.

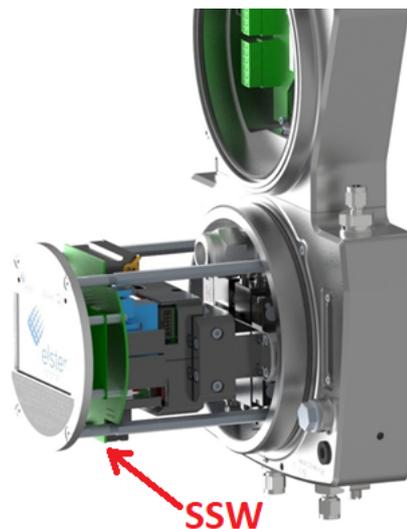


Fig. 6-1: Position of SSW

Prerequisite(s)

- The instrumentation area is open. ⇨ [5.5 Opening and closing GasLab Q2](#) (p. 70)
- Angled tweezers or forceps and mirror are available

## Steps

The SSW connection pins can be found on the underside of the main board (Q2BASE) between the battery and the USB connector.

### Close SSW

01 Insert the jumper using angled tweezers or pliers.

02 Use a mirror to check the correct positioning. Compare the following figure.

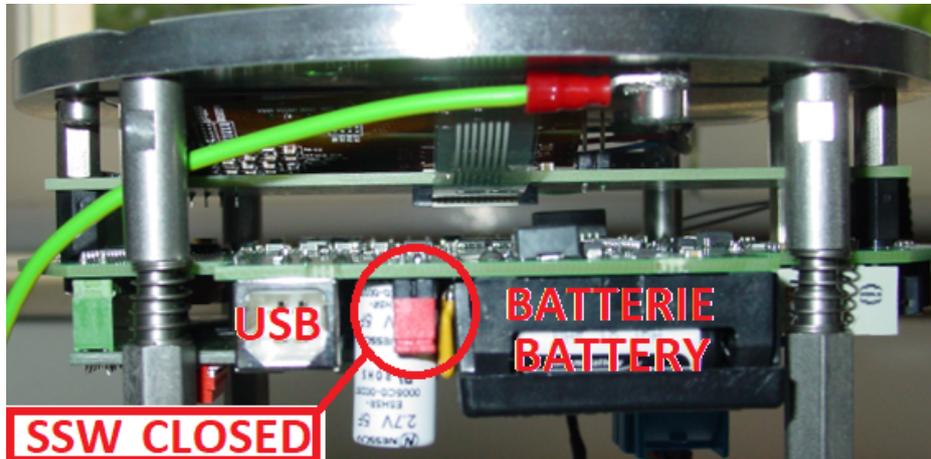


Fig. 6-2: SSW closed (jumper connected)

03 If the jumper is seated as shown, close the instrument ⇨ [5.5.2 Closing the housing of Gaslab Q2](#) (p. 72)), otherwise repeat the above steps.

### Open SSW:

01 Pull off the jumper with angled tweezers or pliers.

02 Use a mirror to check the correct removal of the jumper. Compare the following figure.

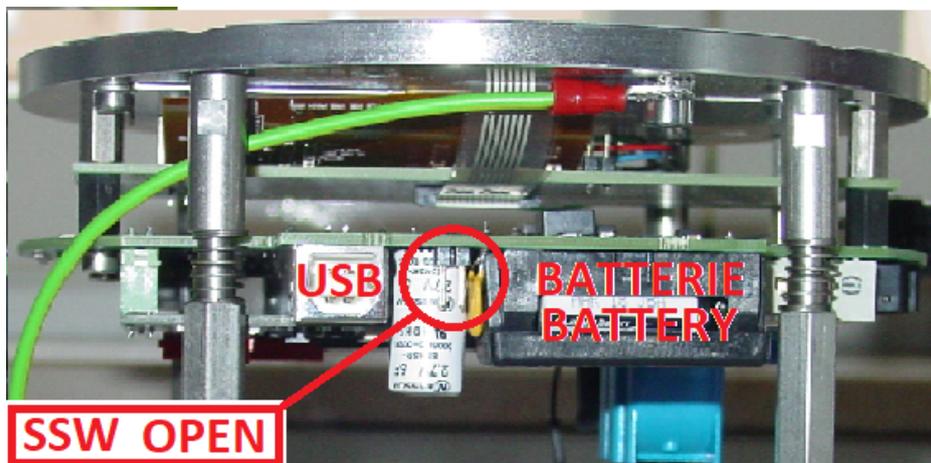


Fig. 6-3: SSW open (no jumper)

03 If the contacts are free, as shown, close the instrument ⇨ [5.5.2 Closing the housing of Gaslab Q2](#) (p. 72)), otherwise repeat the above steps.

## 6.1.5 Additional conditions for fiscal metering

In the case of fiscal use, the conditions laid down in the relevant approval must be met. This is ensured by a file in the device that adjusts the settings. For final commissioning, the calibration switch or security switch (SSW) must be closed. You can attach a seal directly to the SSW (jumper) to prevent or detect unauthorized access.



### **Presence of an authorized person (calibration officer)**

Within the scope of fiscal metering, depending on the regulations of your country, for the final commissioning the presence of an authorized person (calibration officer), who carries out officially protected work on gas-technical plants is required.

Details of the SSW are given in section → [6.1.4 The hardware parameter guard \(SSW\)](#) (p. 95). For the approval file have a look into → [8.2.6 Fiscal parameters and optional using of approval file](#) (p. 218).

The applicable regulations on sealing the device must also be observed during fiscal operation. Make sure that you comply with these regulations.

## 6.2 Standard commissioning and normal operation

Step	Action: Commissioning
1.	Check the state of the system and the connections.
2.	Open the operational calibration gas cylinder (setting 0.2 MPag $\pm$ 2 barg $\pm$ 29.01psig)
3.	Open the process gas (PG) (setting from 0.15 MPag $\pm$ 1.5 barg $\pm$ 21.76psig to 0.3 MPag $\pm$ 3 barg $\pm$ 43.51psig = max. inlet pressure)
4.	Switch on the power supply

The start procedure is now executed automatically. It starts by powering up the computer and heating the sensor block.

The current temperature of the sensor block (TSB) is also shown on the display during this time. The heating time of a cold device can take up to one hour in a cold environment. All dependent values are displayed in RED as an error before the working conditions are reached.

When the temperature of the sensor block reaches the operating range (70°C  $\pm$ 158°F  $\pm$  343K), a start delay, which is also displayed, will commence. Outputs and inputs of the device are not yet active during this time.

After the start delay has expired, the instrument is flushed with measuring gas and the inputs and outputs are activated. The device then automatically switches to standard mode, known as "Analysis". This is displayed on the screen of the instrument. The Q2 now operates with the adapted factory setting, which also determines the starting behaviour described above.

Step	Action: Continuation commissioning
5.	If necessary, open the bypass and check the gas flow. If necessary, set it to the valid range. see next section.
6.	Check and change the device settings and signals if necessary, see next section

GasLab Q2 works continuously after all steps have been carried out and the standard commissioning is finished.



**The right LED flashes in RED when errors occur. If there are currently no errors, the LED lights up permanently.**

The color depends on the event history. For more information [↔ 7.1 LEDs on the operation panel](#) (p. 104)

## 6.2.1 Checking the setting and signals

Adjustment of the gas flow is only necessary if the right LED of the device flashes red. This can be due to local installation conditions or the use of the bypass and indicates that the internal pressure is too low.

In case of flashing LED, first try to increase the pressure of the process gas to 0.2 MPa  $\pm$  2 barg  $\pm$ 29.01 psig overpressure. Make sure that the upstream installation can supply up to 370 l/h of gas to cover all possible operating settings.

When using the bypass, its flow rate must be adjusted to the conditions of the installation. This can be done with the left needle valve (usual set about 50 l/h). The valve spindle is secured with a lock nut, which must first be loosened and tightened again after adjustment. Try to reduce the flow when the right LED is flashing. If you don't use the bypass close the valve completely.

**Only if you cannot change the external conditions above**, carefully turn the right needle valve until the LED lights up permanently. Be careful not to close the needle valve completely. The ball of the right flow meter must at least float slightly.

Mark the position of the ball of the right flow meter beforehand and note the spindle revolutions of the valve to be able to restore the delivery condition if necessary.

The valve spindle is secured with a lock nut, which must first be loosened and tightened again after adjustment. This process reduces the flow and increases the internal pressure.



### PROHIBITION INTERDICTION!

- **Close the needle valve on the right-hand side fully**  
*Fermez complètement la vanne à pointe au côté droit.*

The valve is for regulation only, it is not a shut-off valve!  
*La vanne sert uniquement à la régulation, ce n'est pas une vanne d'arrêt !*

⇒ [4.1 Description of the measuring method](#) (p. 56)

If it is also not possible to generate a valid internal pressure in this way, turn the needle valve back to its original position. The device must be subjected to a further error analysis. ⇒ [9.3.1 Pressure alarm analysis](#) (p. 249).

A complete check of the current parameter set can be made using the **enSuite configuration and analysis software** with an online connection to the GasLab Q2. See also section ⇒ [8.3.2 Online parameterization](#) (p. 232).

Parameterized output signals can be measured using suitable measuring equipment. The digital communication (Modbus, etc.) can be checked using suitable tools (for example, a protocol analyzer).



**Preferably use the cable ends outside the instrument for the measurement. Never open the device when in operation. When check cable ends inside the device, refer to** ⇒ [5.5.1 Opening GasLab Q2](#) (p. 70)

## 6.3 Decommissioning and disposal

### 6.3.1 Decommissioning and disassembly



**WARNING! Risk of explosion**  
**AVERTISSEMENT ! Risque d'explosion**

DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT

*NE PAS OUVRIR EN PRÉSENCE D'UNE ATMOSPHÈRE EXPLOSIVE*

For safety reasons, the decommissioning of the enCore device may only be performed by the service or appropriately trained specialist personnel of the operator.

*Pour des raisons de sécurité, la mise hors service de l'appareil enCore ne peut être effectuée que par le service ou le personnel spécialisé dûment formé de l'exploitant.*



#### **NOTICE**

Before making any changes to the wiring, it is essential to ensure that all cables are de-energized. The enCore device can be damaged if cables are removed while the power supply is switched on.

Improper removal of components may cause additional hardware damage, the device will not work any longer. Carry out the work with the appropriate level of care if you want to use the device again.

If the device contains hazardous media e, g. toxic gases, they must be removed before its dismantling. Prevent the release of potentially pollutant or dangerous substances.



#### **AVIS**

*Avant toute modification du câblage, il est essentiel de s'assurer que tous les câbles sont hors tension. Le dispositif enCore peut être endommagé si les câbles sont retirés alors que l'alimentation est sous tension.*

*Un retrait incorrect des composants peut entraîner des dommages matériels supplémentaires, l'appareil ne fonctionnera plus. Si vous souhaitez réutiliser l'appareil, effectuez les travaux avec le soin nécessaire.*

*Si l'appareil contient des substances dangereuses, par exemple des gaz toxiques, elles doivent être éliminées avant son démontage. Empêchez le rejet de substances potentiellement polluantes ou dangereuses.*

**To take the enCore device out of operation, proceed as follows:**

- 01 Disconnect the device from the power supply.
- 02 Turn off all gas flows and depressurize all gas inlets.
- 03 Here, too, prevent the unintentional opening of the shut-off valves by taking suitable measures so that no danger can arise from further disassembly.
- 04 In a non-explosive atmosphere, remove all connected gas lines, cables and data lines.
- 05 Dismantle the device mechanically.

**Next steps:**

- In case of temporary decommissioning: ⇨ [5.1 Storing GasLab Q2](#) (p. 60) To do this, return the device to the condition in which it was transported.
- For final decommissioning open the device ⇨ [5.5.1 Opening GasLab Q2](#) (p. 70), disassemble the HMI module and turn the back side upwards You are looking directly at the CPU3 card with the SD card holder(as shown).

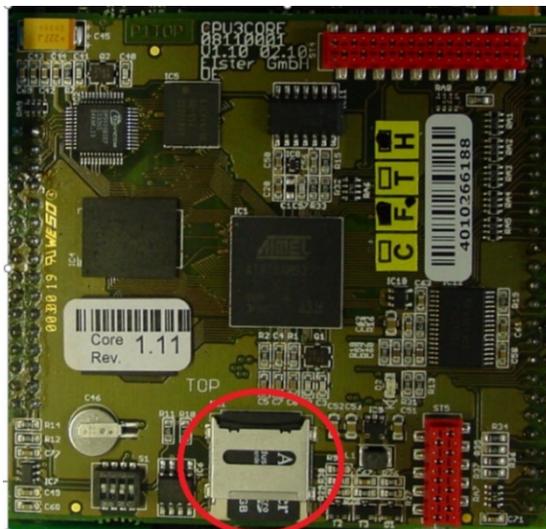


Fig. 6-4: Open SD card holder

- Open the SD card holder by sliding the cover down and remove the SD card to prevent unauthorized third parties from accessing the device's data. To prevent data from being recovered even after deletion, we recommend destroying the SD card.



**NOTICE AVIS**

Destroying the SD card means, the device will not work any longer.

*Détruire la carte SD signifie que l'appareil ne fonctionnera plus.*

- Remove the battery ⇨ [10.4.3 Remove of the battery](#) (p. 276)



#### NOTICE AVIS

##### Proper disposal of the battery *Mise au rebut correcte de la batterie*

Please note that batteries are subject to hazardous waste treatment. Drop them off at a collection point or have them disposed of by a specialist company.

*Veillez noter que les piles sont soumises au traitement des déchets dangereux. Déposez-les dans un point de collecte ou faites-les éliminer par une entreprise spécialisée.*

## 6.3.2 Disposal

enCore devices fall under the WEEE directive and are marked with the WEEE symbol . It is important to note that disused enCore devices must be sent to an individual or collective take-back and disposal system. As the EU member states have transposed the WEEE directive into national legislation in different ways, the regulations for the return of disused equipment vary.

Please ask your local Honeywell sales partner how the take-back of your equipment is regulated.



#### Environmentally friendly disposal according to WEEE directive

The WEEE directive 2012/19/EU was issued by the European Commission. WEEE stands for “Waste of Electrical and Electronic Equipment”. It aims to create a legal framework for sustainable production and consumption of electrical and electronic equipment through reuse, recycling and other forms of recovery of used electrical and electronic equipment. The proportion of such devices in household waste should be reduced, raw materials should be collected and sent for recycling.



#### NOTICE

##### Remove battery before shipping or disposing of the enCore device.

Note that batteries are subject to hazardous waste treatment. Remove them before shipping the enCore device and hand them in at a collection point or have them disposed of by a specialist company. ⇨ [10.4.3 Remove of the battery](#) (p. 276)

## 7 GasLab Q2 operation panel and operation

GasLab Q2 will begin its starting procedure after the power supply has been connected and it has been switched on. The interactive HMI, the screen and the LEDs, are activated. This combination is also called operation panel.

In this start display, GasLab Q2 always displays current measured values for partly saturated gas.

Process-dependent values (e.g. temperature, pressure, etc.) are initially displayed in red (as a fault). When the operating conditions are reached and the status is error-free, the display color changes to black. Both LEDs above the screen light up permanently in this case.

No further changes or operations are required for normal analysis operation. Only, some functions and operating modes (known as operations) do require the use of other displays, or the use of the **enSuite configuration and analysis software**.

Two access options enable device operation:

### Access options

1. via the operation panel local on the device (described in this section)
2. via a PC or laptop described in section ⇨ [8 Configuration and analysis software enSuite](#) (p. 169)

The device has a user management system protected by a password to protect important settings and simplify the parameterization process. For each type of access applies:

- There are no passwords when the device is supplied!
- Passwords can be created and edited on the device.
- Only one user can be logged in at any one time.
- Logins, logouts and password changes are entered into the device's logbook.
- Changes which have been completed but not yet saved are discarded when you log out.



Honeywell can provide classes and training to make the measuring equipment easier for you to use and for using all the individual options offered by the device. If you are interested, please contact ⇨ [12.1 Technical support Flow Computers and Gas analyzers](#) (p. 290)

## 7.1 LEDs on the operation panel

Two multicolored LEDs are placed on the device above the actual screen. On the left the power LED and on the right the status LED. Their color and behavior (steady light or flashing light) indicate whether the measuring device is working properly or whether there is or was a malfunction.

If there is no supply voltage, the diodes are OFF. If the device is supplied with voltage, the power LED switches permanently to green. In the start-up phase and after the supply voltage has been restored, the status LED flashes green. If there are no entries in the fault list, it switches to green continuous light. A red or yellow status LED indicates that there are pending or unacknowledged faults. (The LED status is retained even after a re-start and is displayed again). The status LED indicates the fault status as follows (in order of priority):

Status LED	Explanation
Red flashing	The error list contains at least one pending alarm which has not been accepted.
Yellow flashing	The error list contains at least one pending warning which has not been accepted.
Red, permanently on	The error list contains at least one alarm which has already ended but has not yet been accepted.
Yellow, permanently on	The error list contains at least one warning which has already ended but has not yet been accepted.



The remote operation panel ⇨ [8.6 The Remote operation panel actions](#) (p. 243) shows a simulation of the LEDs.

## 7.2 Screen display on the operation panel

The display of the control panel, is equipped with 7 touch fields, for interactions. Shown as red areas in the following figure, the areas are not visible on the operation panel.

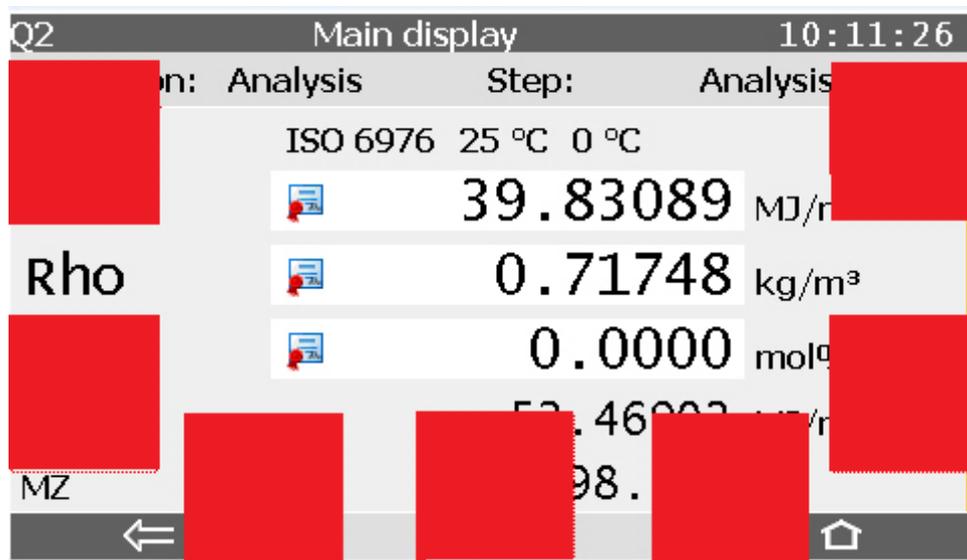


Fig. 7-1: Interactive screen



The display lighting is switched off automatically after a period of inactivity, whose length is adjustable. The display will be visible again after a touch fields has been tapped again.

The operation panel can be operated in various ways. Locally on the device or remotely, then called "Remote operation panel".

The **Remote operation panel** is a constantly updated interactive graphic image of the front of the device. It can be displayed on the PC using the enSuite configuration and analysis software and enables remote operation and observation, analogous to local action on the device.



The remote operation panel simulates tapping the device using the mouse, see [↔ 8.6 The Remote operation panel actions](#) (p. 243)

## 7.2.1 Superimposition keys

If you move your finger over the touch fields of the display on the device or if you click on them with the mouse in the remote operation panel, direction arrows will be displayed pointing left and right, as well as up and down. A confirmation arrow will appear at the bottom of the display.

These displays are known as **superimposition keys**. They enable navigation in the displays and operation. If no further touches or clicks are made, these keys are hidden again.

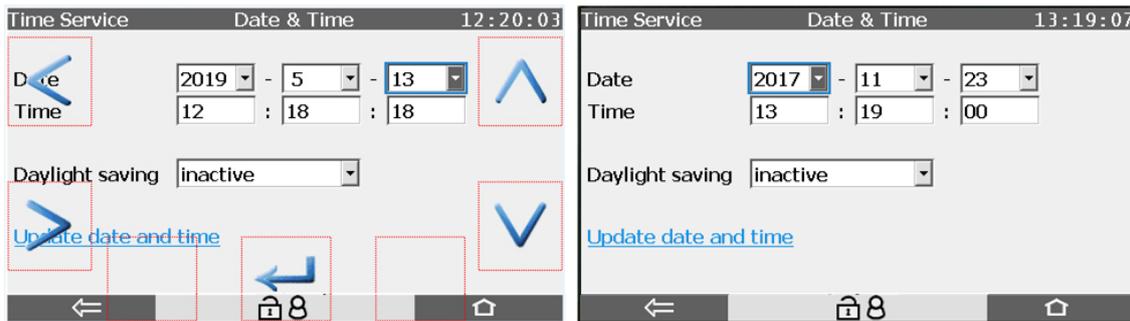


Fig. 7-2: Superimposition keys and touch area fields with superimposition keys



To enable the complete screen to be used, the superimposition keys are only displayed when they are required for as short a time as possible. The superimposition keys are not displayed when the device is started.

Refer to the following information relating to the superimposition keys:

- The first time the (invisible) sensitive areas are activated, the superimposition keys will only be displayed without any further functions being executed. They will then disappear again after 30 seconds if no further action is taken.
- If an area is tapped or clicked again while the superimposition key is visible, the corresponding function will be executed, and the superimposition keys will remain visible for 10 more seconds.
- If no further actions are taken, the areas under the superimposition keys, which are now invisible again, will be active for a further 20 seconds. The keys will be displayed again if actions take place during this time.
- If 30 seconds pass without activity, the display will return to its initial state.

## 7.2.2 Different types of device displays

**Main display** is the name of the first display of an application or a functionality of the basic system; it shows the most important results of this functionality. Depending on the application or functionality, further information is displayed in subordinate device displays.

The **basic display** is displayed immediately after the device is started. If no operation is performed during a preset time, the device switches back to the **basic display** automatically. For some device types, it is parameterizable which display is used as basic display. ⇨ [8 Configuration and analysis software enSuite](#) (p. 169)

**Home** is a special display and shows the software structure of the device. In enSuite you add further entries to the home display .

Single software modules, which shall be easily accessible (e. g. error list or language setting), are represented with small symbols in this display. The symbols are labelled with the name of the corresponding functionality. A user-defined name, if parameterized, is possible– otherwise the default name is displayed..

### Examples and structure of displays



Fig. 7-3: Display **Home** and **Main** display

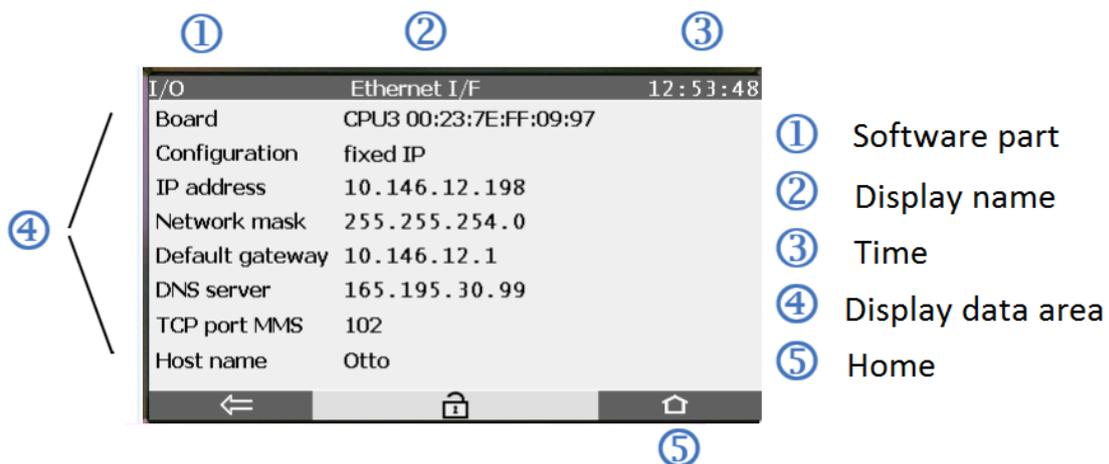


Fig. 7-4: Structure of a display

## 7.2.3 Navigation options

### In general

Two buttons are displayed at the bottom of the touch screen. Depending on the context, you can use the symbols  and  or  and , as well as  or .

Function of the buttons	
	switches directly to the home display.
	switches directly to the basic display.
	switches back to the calling display, i. e. the display that was previously opened.
	accept user action
	discard user action

The basic display can always be reached with a maximum of two steps – either by pressing  and  successively, or by pressing , if this button is displayed directly.

If the buttons are marked with the check marks  or , the device is waiting for a confirmation by the user. (e. g. previously using the Keypad).

### Navigation options in the “Home” display

You open a folder by selecting and confirm its symbol in the display. After having activated the symbol of an application or any other selected functionality, the corresponding **main display** is shown or the function is executed.

### Navigation options in other displays

Most device displays show measurement results, status information or settings.

When operating an enCore device, hyperlinks and actions are distinguished:

- Use **hyperlinks** to navigate through the device's displays
- Use **actions** to perform a specific functionality.

Both hyperlinks and actions are presented in the display with a [blue](#) font color and underlined. If the text is not underlined, the item cannot be selected.

Further items which can be selected on the display are drop-down lists and input boxes.

- A **drop-down list** can be identified by the triangle on the small grey box next to the value with everything being framed in blue when selected.
- Input boxes show their values in white boxes. When a value has been selected, it will be displayed with a blue background and there will be a blue border around the box.

You can select this the entries using the superimposition keys. To confirm or execute the selection with a blue background e.g. "Serial number" press the confirmation arrow box on the device in the center of the bottom line..

If a display contains more rows than can be displayed at once, a scroll bar is displayed. A small yellow diamond on the right-hand edge indicates your position in the content. Use the superimposition keys to scroll.

You can also use the **superimposition keys** to jump to the next selectable item, even if it is not in the visible section of the display.

## 7.2.4 The middle of the bottom status line



Additional information icons are displayed contextually in the middle of the bottom row. It is possible that not all or none are displayed.

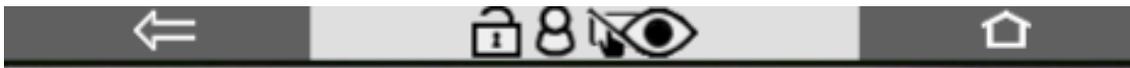


Fig. 7-5: Possible icons in the middle of the status line of displays

For **fiscal measurements**, settings relevant for approval must be protected. For this purpose, conductor connections must be made inside the device via the security switch (SSW). If these are missing, this symbol  (open padlock) is displayed, which then appears in every display. In **non-fiscal operation**, the connections can remain open. Since the housing must be opened to operate the security switch (SSW), special rules apply, see [⇨ 6.1.4 The hardware parameter guard \(SSW\)](#) (p. 95). You can also have a seal affixed to the switch its selve to verify unauthorized access. Contact Honeywell if necessary.

If the symbol  is shown, somebody has logged in and is working with the device. Normally you are the logged in user, if not you should not carry out any further activities, so as not to disturb the work of the user who is logged in. If several people access the device, mutual agreement is always required.

(Further information on this is provided in section [⇨ 7.3 Displays and functions](#) (p. 113)



These symbols provide information about the visualization settings and input conditions on device displays or the remote operation panel.

The following table gives an overview:

### Options at a glance:



means that the security switch (SSW) is open.



means that the user is logged in.



One or more remote controls are active. The local user sees the screen content and can operate the device .



The device is operated remotely. The local user sees the actual screen content but cannot operate the device.



The remote user sees a lock screen because the local input is active.



Without user login, remote operation panel and with closed security switch (SSW) no symbols are visible. Further information will follow in the course of this manual.

## 7.2.5 Visibility of the displays

When accessing the device via remote control, the local user sees a lock screen on the device by default, unless the remote user changes these settings. → [8.6 The Remote operation panel actions](#) (p. 243)

The lock screen hides the actual device display and does not allow any operation until it is removed by the remote user or the system. For devices with the software Q2BASE 1.0.7 (available from Sept. 2020) the remote access can also be canceled locally. This is done by simultaneously activating the sensitive navigation areas at the bottom of the display, as shown on the lock screen.

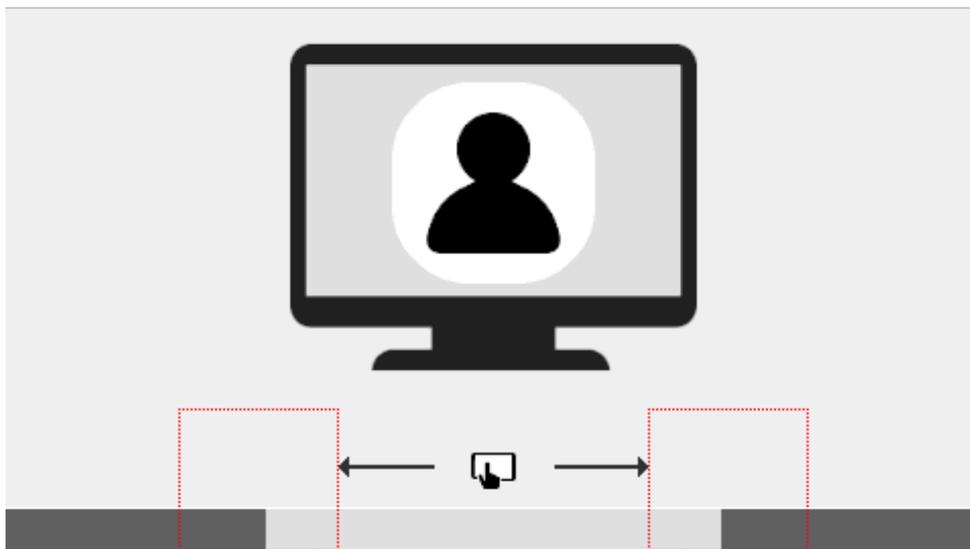


Fig. 7-6: Lock Screen

## 7.2.6 Entries and changes using the operation panel



Changes on the device are always made in the following steps:

- Log into the device
- Complete and confirm the changes on the device
- Log out of the device

Use the **Users main display** to log in, confirm and log out ⇔ [7.3.6 Display and operation](#) (p. 132). The procedure for changing parameters is also described there.

Values which can be changed are displayed in white boxes. These are editable boxes. These editable boxes appear depending on the login status and user rights. Changes are not finally entered and saved to the device until the user has explicitly confirmed them. If the user has logged out beforehand or is logged out due to another event without confirming the changes, any changes that have been made will be discarded. Entries and changes can be made either using a drop-down list or the displayed keypad.

Changes using a drop-down list are shown in the following example.

A drop-down list can be identified by the small gray box with a triangle next to the value to be changed, in this example after month and day. The view will change when you click on it, in the example the year.

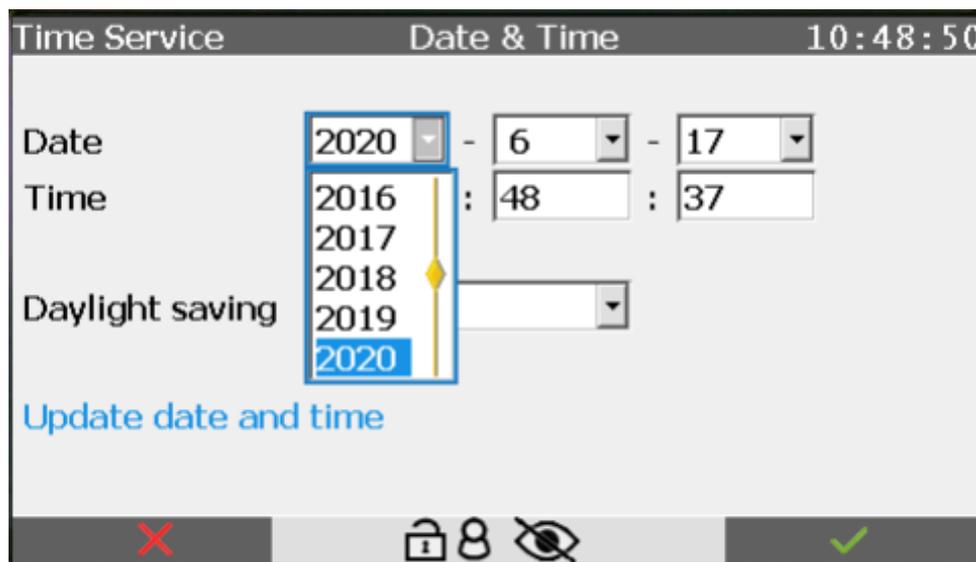


Fig. 7-7: Drop-down list open

The drop-down list is opened and displays the available values. The superimposition keys enable you to select a value from the drop-down box. Your selection then has a blue background (in the example 2020).

After this user action, confirmation  or discarding  of the selection is requested, therefore the buttons at the bottom of the display area are marked with corresponding icons. See the figure above.



If you have confirmed the selection, you also must execute your change.

In the above example, this is the action Update date and time. which is then underlined.

Changes using a displayed keypad for entering letters and numbers. To prevent local users from inadvertently blocking remote access, the virtual keyboard closes automatically after one minute of inactivity - no input is visible on the remote operation panel.

You can identify an entry box by its white background. When the box has been selected, it will have a blue border and the content (if there is any) will have a blue background. In the following examples, the entry boxes for Password and Time can be seen. The view will change after you click on a box as shown below and the keypad will be displayed.

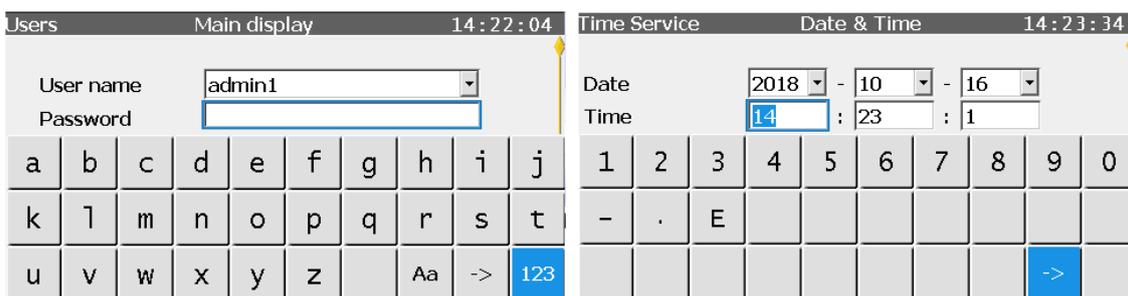


Fig. 7-8: Keypad displayed

Depending on the expected entry, a keypad which can be switched between letters and numbers (on the left in the example) or just a number pad (on the right in the example) will be displayed. You can switch between upper- and lower-case letters using the "Aa" key. You can switch between letters and numbers using the "123" or "ABC" key. If a special symbol must be entered, the "Aa" key will also appear on the number pad. When this is pressed, the special characters will be displayed and can be selected.

The superimposition keys enable you to select a key (button) in the box. Your selection then has a blue background. You can adopt the selected value using . In this case, the keypad will remain open and you can select and add another value in the box.

If all the values are already filled in, you can close the keypad using and keep all the entries in the box.

You can discard the entries using . The keypad will also close. When you leave entry mode, a consistency check is made to find whether a value has been entered which in this context is nonsensical or not allowed. If this is the case, the value is not saved and the previous one is retained or replaced by a substitute value.



If only individual characters are to be replaced, it is possible to jump to the end of the existing entry using the key and then supplement the entry.

At the same time, the key changes and shows the following symbol which allows individual characters to be deleted starting from the right.

If the entry requires a restart, this is indicated in the display with a link. The restart is then carried out immediately after you click on the link. If you log out without completing the restart, the changes will not be saved. An example of this is changing the IP address.

## 7.3 Displays and functions

Although the Q2 main display contains all the relevant information, some applications require you to change the display. You can get to any display using the navigation methods explained in the previous section. In addition, device dialogs and confirmation prompts guide you through the displays. Progress displays provide information about the success and progress of actions.



The current time is shown in the top right-hand corner of most device displays.

Changing display is generally done using a special display known as “Home”. This is the main node for the device. This display is explained first of all as it provides a better understanding and a good overview. Starting from the “Home” display, various other displays and functions are then presented as well as the details described.

### 7.3.1 Home display (overview)

“Home” is a special display that can show the structure of the device software. Individual software parts and selected other functions that should be easily accessible (e.g. switching the language) are displayed here in the form of small icons. These are marked with the name of the respective function.



After start-up or power-up, the “Home” display can be accessed by using .

The number of displayed icons, which in turn may contain further branches, depends on the version used and the parameterization. The menu structure is like a tree, in other words, a subordinate menu option of a module may, in turn, include subordinate menu options and branch off to the side. The following figure shows an example of this main node.

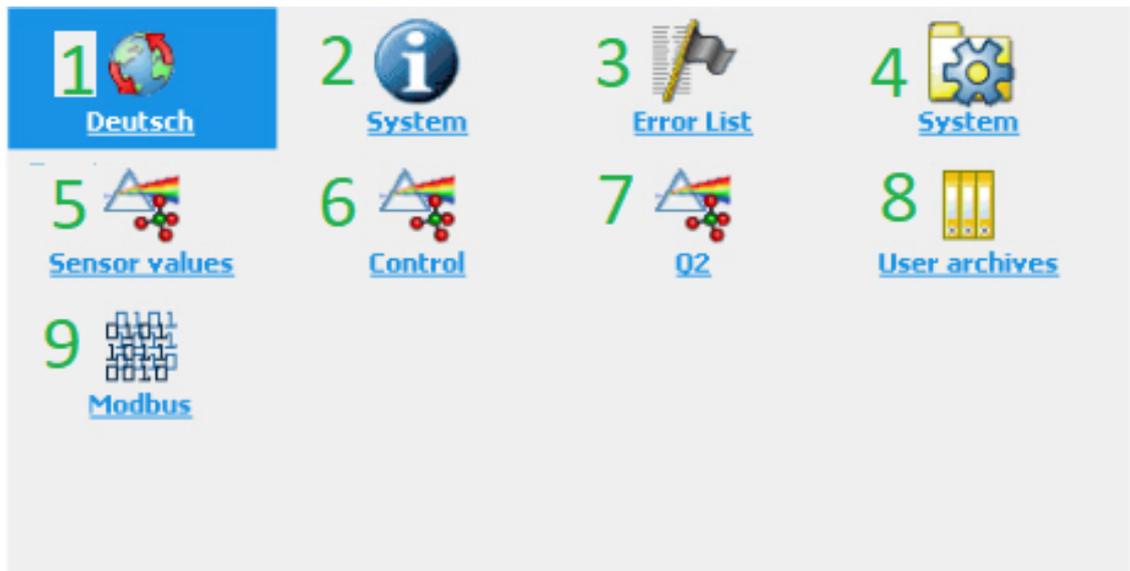


Fig. 7-9: "Home" display node (example)

If you have the required rights, you can change and supplement this display.

⇒ [Define basic display and edit display behavior](#) (p. 200)

The following describes only the contents of the **"Home"** display that are usual on delivery.

### Home display (Navigation options)

Selecting a symbol (using the superimposition keys) in the Home display will open it to display the functions grouped in this folder. If only one function is assigned to this symbol, selecting it will immediately take you to the main display of this function.

**The "Globe"** enables you to change the language to the language stated below the symbol.

**The displays behind "Info"** provide an overview of "Serial number", "TLS-Certificate", "Device monitor", "Software status", "Display test" and "License info". The state of the security switch is also specified.

**The "Error List – Main display"** contains a complete list of all active errors and those which are no longer active (but have not been accepted).

**The gear wheel symbol** opens the System display, another node to the displays for the time service, user management, logbooks and I/O functions.

**The Q2 sensor values** display supplies the current incoming measurements (raw values) from the transmitters and sensors inside the device.

**The displays under "Q2 control"** enable a calibration or test gas measurement to be started and adjusted and the touchscreen to be deactivated.

**The symbol designated Q2** also enables you to access the Q2 main display (device starting screen) or further information

**The "User archives"** display enables you to select various archives and view them.

**The "Modbus"** display enables you to select various tabs and view them.

## Home display (device language change)

Up to two languages are optional possible. English is always the second language. The devices will always start in the first language. Please notify Honeywell if you wish to change the first language installed in the device.

If English is selected as the first language, the device can only be operated in English.

The design of displays and menus, for example, date and time format, depends on the current parameter set and language.

If the language is changed, all the data in the device will be renamed or reformatted and displayed in the current language.



Carry out the following procedure to change the language:

In the “Home” display select the  “Globe”. The alternative language is shown below the symbol. Confirm your selection. The language has changed. The text beneath the “Globe” shows the previous language as the new alternative.

## Home display (start-up or for system errors)

A system error may occur in very rare cases. If this happens, a prohibition sign will be displayed, and the device will switch to emergency mode.

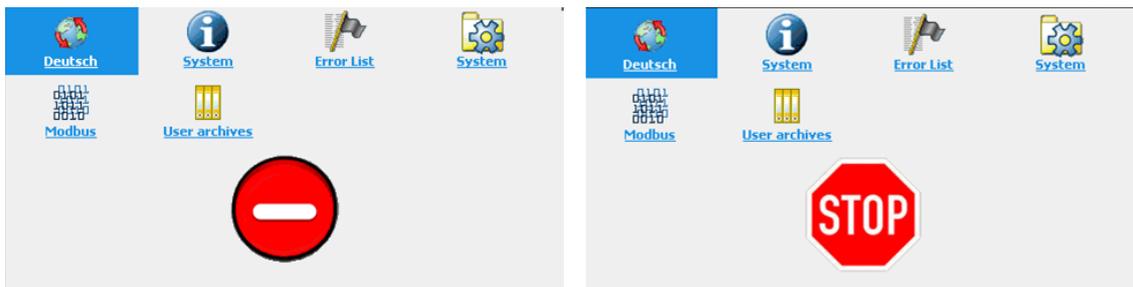


Fig. 7-10: Device not ready

Examples of these errors include uploading an incorrect parameter set or internal connection errors. This means that after or during the start-up process, for example, a one-way street sign will be displayed, and only the basic functions for troubleshooting will be active; all other functions are disabled.



Was the error caused by the parameter set?

Rectify it by transferring a correct parameter set to the device, for example, the default parameter set.

⇒ [Import parameter settings \(Reset device\)](#) (p. 185)

If the error cannot be rectified by the parameter set, please contact Honeywell.

## 7.3.2 Info display (overview)



This symbol opens the following display:

The display shows the device's serial number (first line) and the status of the security switch (SSW). Furthermore, the display provides access to the listed functions:

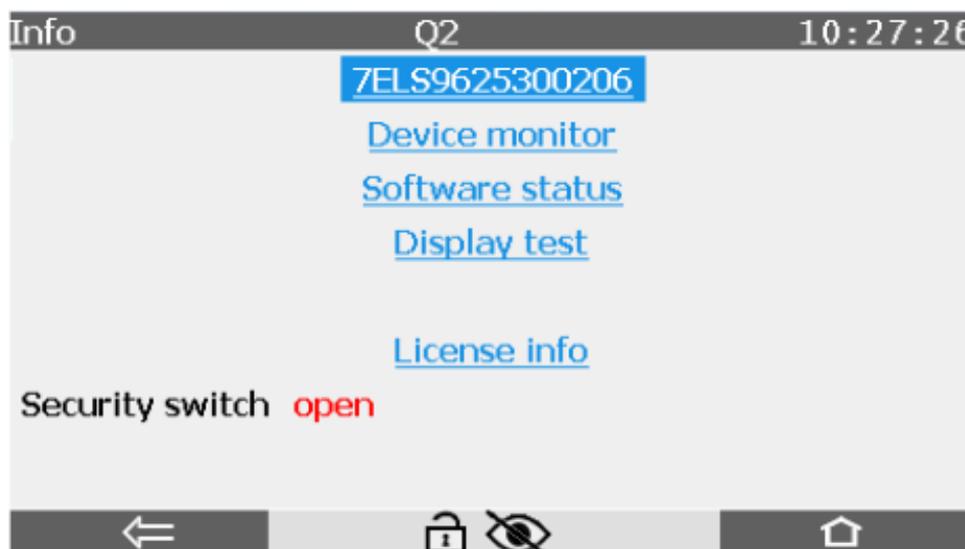


Fig. 7-11: Info (System) display



The functions are described in the next sections.

The security switch (SSW) can either be **open** or **closed**. In the case of devices which are used in the field of legal metrology, it is generally stipulated that the security switch is closed and sealed during operation and can only be opened in the presence of an authorized person.

This protection prevents changes to the fiscal settings or main device settings and software downloads. Refer to ⇒ [6.1.4 The hardware parameter guard \(SSW\)](#) (p. 95)

### Info display (Serial number and TLS certificate)

After activate the serial-number-link the display **<Serial number of the device>** shows important information **Device type** and **CPU Serial number** as well as further links and functions.



When the system is started, the device compares its data with the so-called basic device settings. If it detects deviating data e.g. incorrect device type or wrong CPU number, during the consistency check, these are shown in red in the display.

The link [Certificate](#) on the display enables to view the MMS certificate for secure data transmission. The display action [Delete certificate](#) allows the authorized user to delete the existing certificate and create a new one.

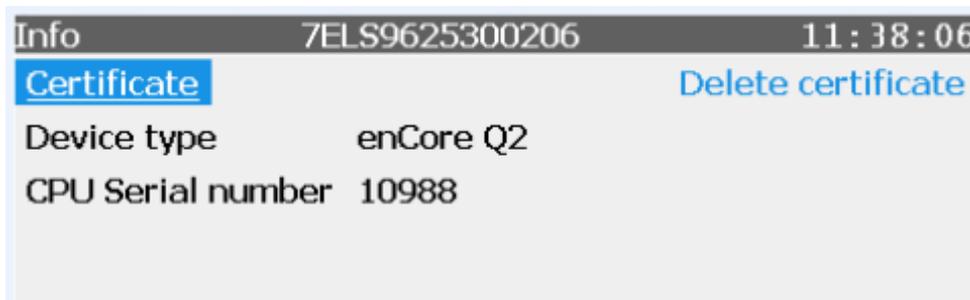


Fig. 7-12: Display serial number (example)

The certificate display shows the details of the used certificate for secure data transmission. Since the display is too long to be shown completely, use the small yellow diamond on the right-hand edge or scroll use the up and down arrows on the display.

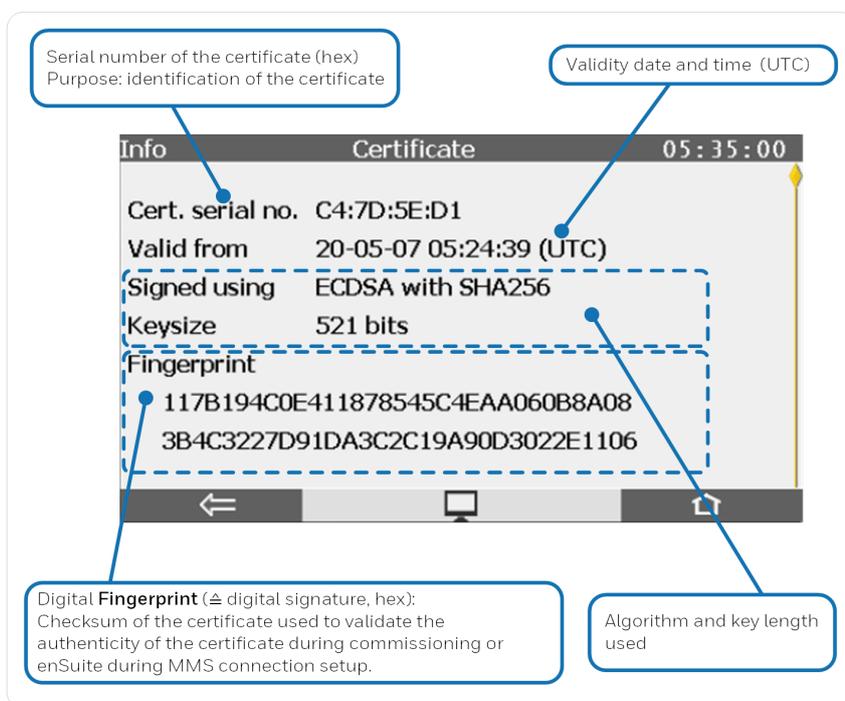


Fig. 7-13: Display **Certificate** with certificate information, top of page - example

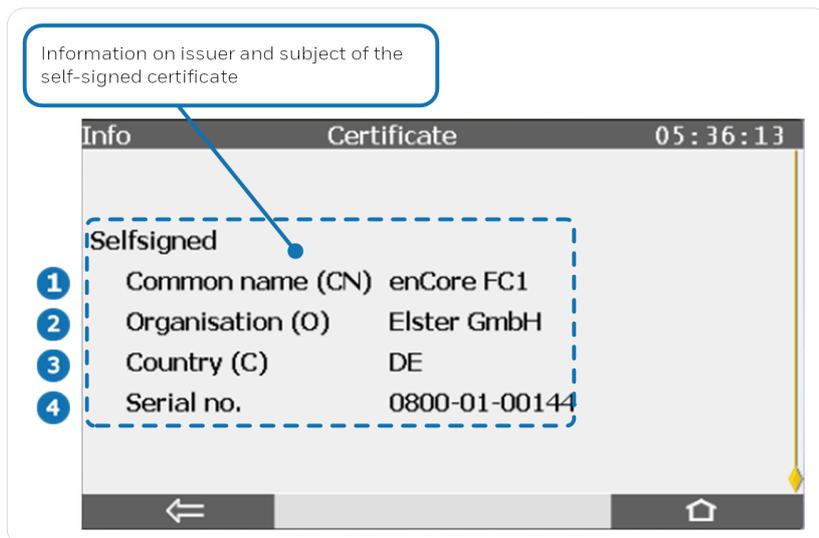


Fig. 7-14: Display **Certificate** with certificate information, end of page - example

Naming convention according to X.500 standard and values for TLS certificates for enCore devices:

- 1 CN = Common Name, *here*: enCore device type
- 2 C = Country; *here*: DE - Germany
- 3 O = Organization; *here*: Elster GmbH
- 4 Serial number of enCore device



To increase security, we recommend that a new TLS certificate always be created if the existing one was made under unknown conditions, e.g. on the transport route or in trial operation

## Info display (Device monitor)

The device monitor shows information about the operating hours and battery charge and about the CPU and RAM load. **Navigation: Home- display – Info – Device monitor**

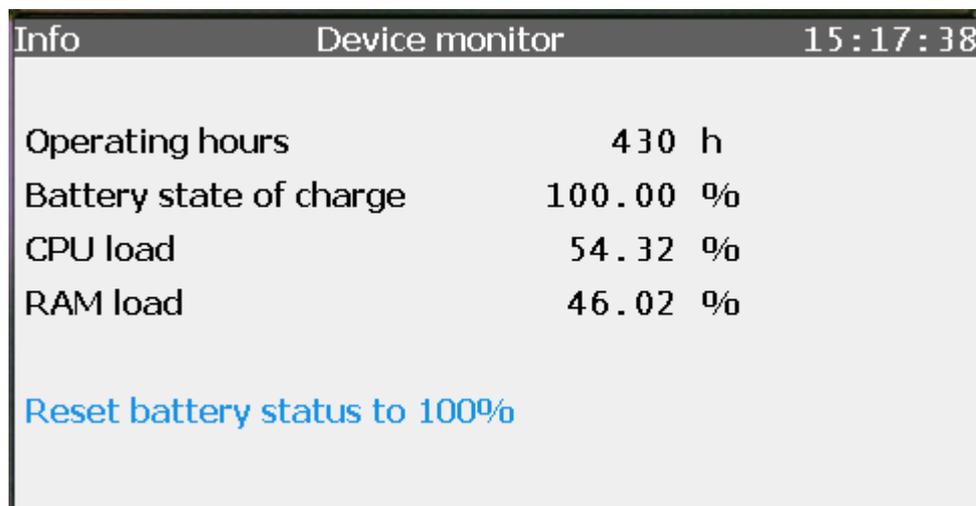


Fig. 7-15: System info – Device monitor display

Device monitor	
Operating hours	Elapsed hours that the unit has been on and running since manufacture.
Battery state of charge	Remaining battery charge in percent. (The battery is mainly used when the instrument is switched off. The message "Battery charge low!" is displayed when the battery capacity has dropped below 20%. The battery must then be replaced).
CPU load	Current utilization of the CPU in percent. (Message "CPU load high!" can optionally be displayed if a warning limit has been parameterized).
RAM load	Current load of the main memory in percent. (for information only)
Reset battery status to 100%	Action to reset the battery status to 100% after a battery change (action only active when logged in with the appropriate authorization. A service technician should perform this action to keep the device data up to date. In case of error, "Reset failed!" is displayed.)

## Info display (Software Status)

Software status shows the identification data of all software parts in the device. The data consist of the name of the software parts, the version number and the checksum. In addition to the “**Last check**”, the topmost line contains the date of the readout for the following information.

The **first column** lists the names of the software parts. These names are selectable hyperlinks and take you to subordinate displays (component displays) containing information on the corresponding software part.

The **second column** contains the software version number of the components and the third column contains the relevant checksum. During operation, the actual checksums are calculated and compared to the reference values.

If an **entry (checksum) is marked red**, the last test failed, in other words, a discrepancy was identified. In this case, an error is generated. Information about checksum can be found in the glossary.

Info	Software status	11:13:07
Last check	19-06-05 11:12:41	
<a href="#">Q2</a>	03-39-A	3B3EEB0D
<a href="#">NonFiscal</a>	Elster	E3E263D3
<a href="#">6 Q2SENS</a>	1.2.0	C0661248
<a href="#">7 Q2BASE</a>	1.0.5	F4890DA2
<a href="#">Basic System</a>	03-39-A	A0AD8AC9
<a href="#">Q2</a>	03-12-A	81A790E1
<a href="#">Postprocessing</a>	03-11-B	3997C826
<a href="#">Hardware</a>	03-10-11	11704715

Fig. 7-16: System info – Software status display

The following shows examples of component displays. You will find the following information: Last check/Software part/Name/Version/Software/All parameters

Info	Software info	11:25:23	Info	Software info	11:26:19
Last check	19-06-05 11:25:02		Last check	19-06-05 11:26:04	
SW part	Q2		SW part	I/O	
Version	03-34-A		Name	7 Q2BASE	
CRC total code	3B3EEB0D		Version	1.0.5	
CRC param. total	F23EB25F		CRC total code	F4890DA2	

Info	Software info	11:27:11	Info	Secured parameters	13:27:37
Last check	19-06-05 11:27:06		Name	Q2.Base calibration.20% CO2 / 80% CH4.Inlet	
SW part	AFB		Value	Inlet CAL	
Name	Q2				
Version	03-12-A				
CRC total code	 54F4F886				
CRC param. secured	 886F 54F-				
CRC param. total	49DF03B9				
Build	NQM_Build_GIT_82				

Fig. 7-17: System info – Software info display example



Above only examples are shown. If the device is not used with an approval file, the “**Secured parameters**” display will not be available. Furthermore, some links can only be selected if there are no red entries. As the example shows, the component displays do not have a uniform structure.

The “**Software status**” display shows the short name of an **approval file** in second place on the list. This file contains the definition of which parameters are backed up before being changed so that the device can be operated in compliance with customer specifications or approvals.

Operation without an approval file is also possible. In this case, as in the example above, **NonFiscal** is displayed as the abbreviation. If the device is operated with an approval file and a closed SSW, the appropriate parameters are protected to prevent them being changed.



If you wish or have to backup parameters with an approval file, refer to section ⇨ [6.1.4 The hardware parameter guard \(SSW\)](#) (p. 95) and section ⇨ [8.2.6 Fiscal parameters and optional using of approval file](#) (p. 218). If necessary, contact Honeywell.



If an approval file is used and both the official access rights of the parameterization as well as the fiscal software component versions are in line with the approval file, then this text is black; the text is red in the event of any deviations.

If you activate the hyperlink of the Approval, a display is then evoked which contains detailed information on the approval.

If the device is operated with an approval file and a closed SSW, the appropriate parameters are protected to prevent them being changed.

### Info display (Display test)

Using the display test, you can check whether the device display is working correctly. Not all enCore devices have a display.

Prerequisite(s)

- Home display is shown, switch to this display with  if necessary.

### Steps

- 01 Open the **Info** display behind the symbol 
- 02 Start the test with the action [Display test](#). All pixels of the data area are shown alternately black and white. Defective pixels keep their color.
- 03 End the test with  or .

If the test shows that the display is faulty and a number of pixels are not responding, it may be necessary to replace the display. This is done by changing the affected module.



This function is also remote available, but in this case the test result is not meaningful. ⇔ [8.6 The Remote operation panel actions](#) (p. 243)

### Info display (License info)

The hyperlink on the overview leads to the following display with details of licenses, copyright and rights.



Fig. 7-18: System info – License info display

### 7.3.3 Error List – Main display (accept / quit error messages)

The device manages the warning and alarm messages in the error list (located on Home display) and reports them in the logbook. Which messages appear, depends on the parameterization of the device.

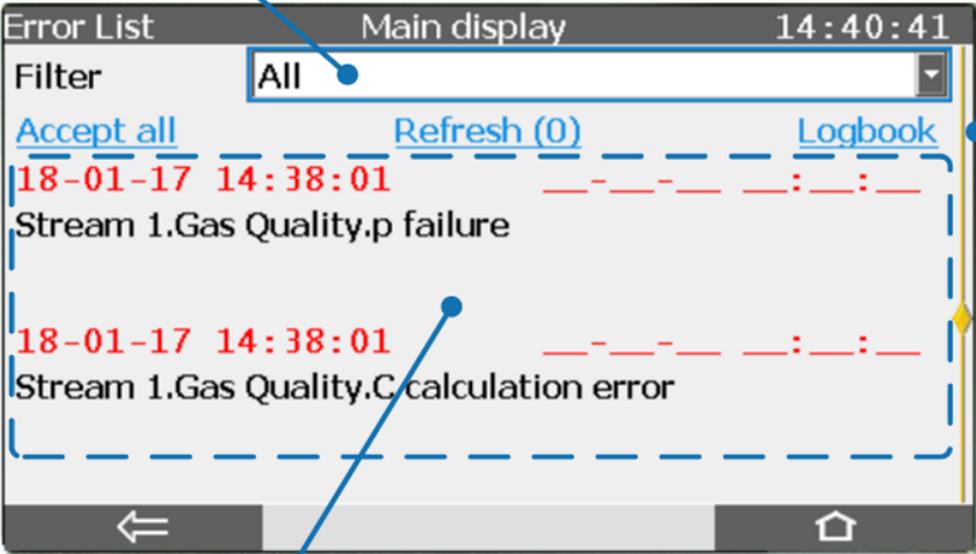


If the status LED is lit or flashing in red or yellow, there are entries in the error list. The list can be opened by clicking on this symbol in the home display .

The figure below shows an example of the error list and explains the display in detail.

Hyperlinks for:

- Action [Accept all](#)
- Action [Refresh \(<n>\)](#) the display (number in bracket  $\hat{=}$  number of new messages)
- Go to the [Logbook](#) display



List of error messages

Fig. 7-19: Error list Main display

#### In general:

- The error list is sorted in chronological order based on the time at which each the message was received, with the latest message being displayed first.
- If it contains more messages than can be shown on one screen, the scroll bar appears in the right margin.
- Using the Filter drop-down list, this full list can be filtered so as, for example, to view all the messages for one stream.

**Action Accept all** The Accept all action enables you to accept all the messages in the current filter selection which have ended; they will then disappear from the error list. Depending on the parameterization, a user may first have to log into the device to perform the Accept all action.

**Action Refresh (<n>)** While the error list is displayed, the states of errors which have already been displayed are updated continuously. New errors are not automatically added to the list. You can update the list manually using the Refresh (<n>) action. The number in brackets shows the number of new errors, which means the display is up to date if a zero is displayed here, i.e., Refresh (<0>).

**Hyperlink (Logbook)** You can go straight to the logbook display from the error list display using the Logbook hyperlink.. Here you will find further information to enable you to analyze the cause of the message in more details. ⇨ [7.3.7 System display \(Logbook\)](#) (p. 138).

### Time stamp for when the message begins and ends

The Begins time stamp is shown on the left for each message and the Ends time stamp on the right (if the error has already ended). The time stamps for all **alarms are displayed in red** text and for all **warnings in yellow** text. A current error can be identified by the fact that the Ends time stamp on the right has not yet been entered and instead, empty boxes are displayed (as in the above example).



Entries must be accepted, this is done list-wise and not individually. The action is defined in the parameter **Acceptance procedure**. This parameter checks if only errors, which are no longer currently pending, can be accepted or whether errors can always be accepted irrespective of whether they are currently pending or no longer pending. Refer to the online help of ⇨ [8 Configuration and analysis software enSuite](#) (p. 169) for details about the acceptance procedure. (branch **Basic System – System**, section **Error List**)

Step	Acceptance procedure clearing the error list
1.	Navigate to error list and open it. (Activate: Home >>Errorlist).
(2.)	In order to accept messages of a specific software part from the list, open it by selecting the corresponding entry or <Group> from the drop-down list <b>Filter</b> .
3.	Select "Refresh" to update the list which had been frozen upon opening (number in brackets = number of new messages).
4.	Trigger the action <a href="#">Accept all</a> . The selected list is accepted and updated according to the parameterized acceptance procedure.
(5.)	If required, repeat these steps for other lists.

After all the entries have been accepted, the system will be returned to error-free status. The status LED will be lit in green.



Honeywell provides assistance with troubleshooting work. ⇨ [12.1 Technical support Flow Computers and Gas analyzers](#) (p. 290)

## 7.3.4 System display (overview)



The system display, a node to additional displays, is opened by selecting this symbol.

You can go to the following sub-displays using this node:

- Time Service ⇒ [7.3.5 System display Time Service \(System time and date\)](#) (p. 126)
- Users ⇒ [7.3.6 Display and operation](#) (p. 132)
- Logbook ⇒ [7.3.7 System display \(Logbook\)](#) (p. 138),
- Audit trail ⇒ [7.3.8 System display \(Audit trail\)](#) (p. 139)
- I/O. ⇒ [7.3.9 System display I/O \(network settings / inputs/ outputs\)](#) (p. 141)

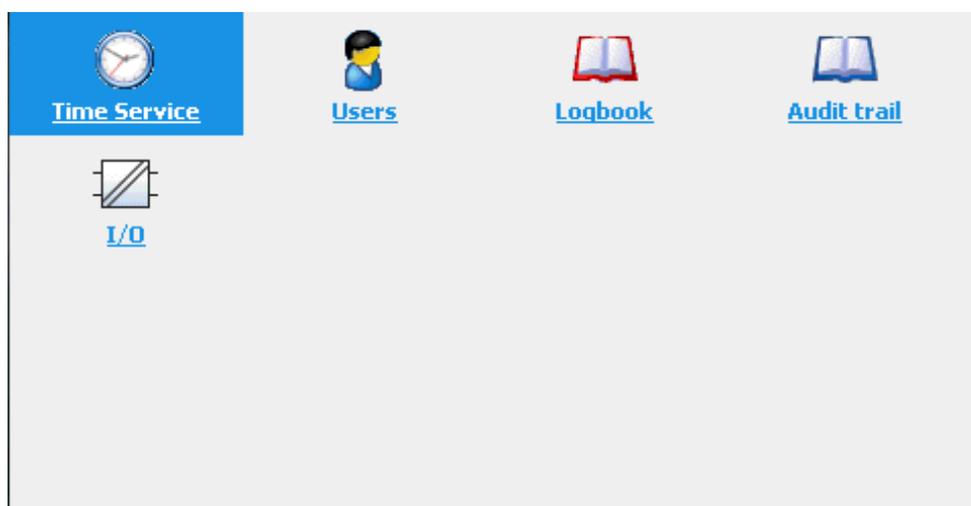


Fig. 7-20: System display

## 7.3.5 System display Time Service (System time and date)



Depending on the parameterization, the Time Service has up to four standard displays located behind this symbol. The **Main display** showing the internal time in the device, via links and actions it leads to the other possible and optional displays.

The following figure shows the hierarchical structure of the displays

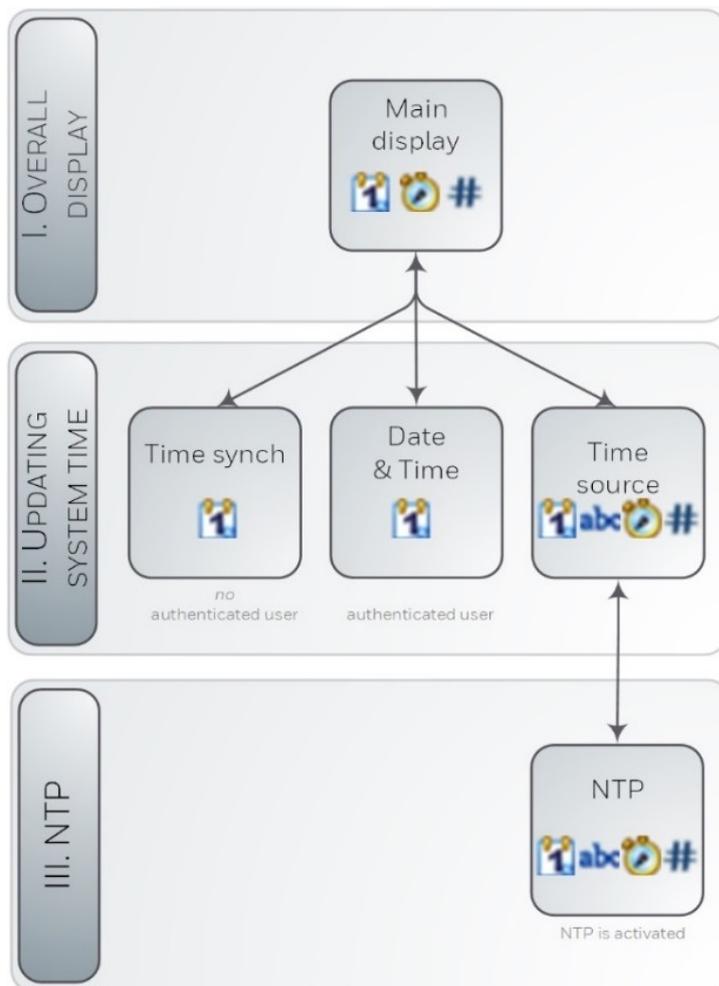


Fig. 7-21: Time Service display overview

Depending on the user login ⇨ [7.3.6 Display and operation](#) (p. 132), the enSuite parameterization ⇨ [8 Configuration and analysis software enSuite](#) (p. 169) and the user's authentication, the main display branches to the corresponding display. The displays **Time source** and **NTP** are only shown when time polling via NTP is enabled.



The system time (permanent device-internal calendar with date and time) is saved on a battery-buffered clock block and available even after the device has been switched off and on again. Changing the system time is the generic term for both synchronization and for adjusting the date and time.

## Time Service Main display

The initial display of the Time Service is the Main display.

(Access: Home - System - Time Service)

Time Service	Main display	11:08:02	Time Service	Main display	14:39:13
Date & Time	2018-10-12	11:08:02	Date & Time	2018-10-12	14:39:13
Time zone	UTC ±00:00 - London, Lisbon, Rat...		<a href="#">NTP overview</a>		
Time zone	UTC ±00:00 - London, Lisbon, Rat...		Time zone	UTC ±00:00 - London, Lisbon, Rat...	
Latest update	---		Latest update	---	
Latest deviation	? s		Latest deviation	? s	
Ext. source	-		Ext. source	-	

Fig. 7-22: Time Service main display without/with NTP synchronization

The Time Service main display shows the date and time (also known as the system time). The abbreviation (DST) means daylight saving time and is only shown if the current time is in daylight saving time.

The Network Time Protocol (NTP) is a standard for clock synchronization in computer systems. The NTP overview link is only displayed if NTP synchronization has been enabled in this device. For Information about activating this function refer to [8 Configuration and analysis software enSuite](#) (p. 169)(branch **Basic System – Time Service**, section **NTP**).

Furthermore, the following is also displayed:

Time zone:	Geographical location
Latest update:	Time stamp of the last time change.
Latest deviation:	Deviation (in seconds) at the last time change
Ext. source:	Number of the external source for the last time synchronization

## Synchronizing system time

For a user who is not logged in or a user who is logged in but is not entitled to change the device time, “**Time Service – Time Synchronization**” will open as the second display after “**Date & Time**” has been activated. (**System > Time Service > Date & Time**)

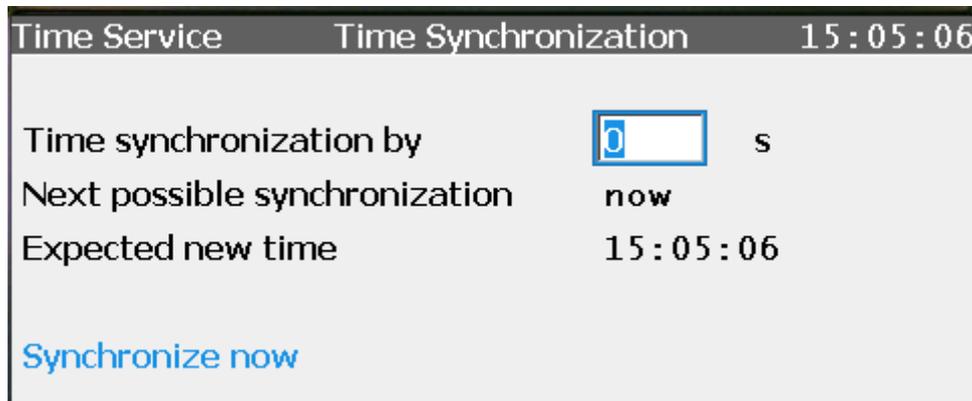


Fig. 7-23: Time Service – Time Synchronization display

### The display shows following information:

- Time synchronization by: A change in the system time is regarded as synchronization if the difference between the old and the new system time does not exceed the parameterized time window (Max. synchronization range). Enter the seconds in the box by which the system time is to be changed. Both positive and negative values may be entered. The box will only accept values within the parameterized synchronization window .
- Next possible synchronization: Next possible time for another synchronization. The calculation is made after a synchronization based on the synchronization interval. The parameter Synchronization Interval determines the time interval that has to pass after an executed synchronization before the next synchronization can be done. If the entry is Now, you can synchronize the system time; otherwise, you must wait until the next specified time.
- Expected new time: The time service continuously calculates the new system time in this line. You can easily synchronize the system time by specifying the difference in seconds relative to the current system time.
- Synchronize now: This action (if available) specifically saves the new time as the system time. The action can only be executed if a synchronization is possible, that is, the specified difference is greater than zero (0) and the system time has not yet been synchronized within this synchronization interval.



By default, you can synchronize the system time by  $\pm 20$  seconds every 12 hours without having the access right Update device time. Refer to [8 Configuration and analysis software enSuite \(p. 169\)](#) online Help (branch Basic System – Time Service) for information about the time service parameter setting.

## "Update date and time"

For a user who is logged in and entitled to change the device time, after "Date & Time" has been activated, the display with the same name will open as the second display.

The type and sequence of the display (this can be parameterized with ⇨ [8 Configuration and analysis software enSuite](#) (p. 169)) is dependent on the language and the time stamp format, for instance. The following shows an example:

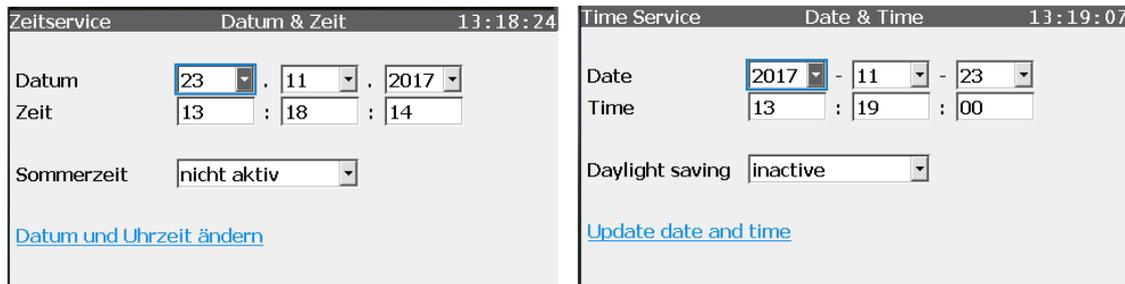


Fig. 7-24: Time Service display "Date & Time" (various time stamp formats)

The system time can be adjusted in this display. You require the appropriate rights for this purpose and the security switch (SSW) must be in the setting specified in the parameter set.

### Action: Setting the time and date

- 01 Log in and open "Date & Time" display.  
(System > time service > Date & Time)
- 02 Enter the current date and time using the drop-down menu and keypads.
- 03 If appropriate setting has been made in enSuite, click on the **Daylight saving box**, and choose between **Active** ( device system time is daylight saving time) or **Inactive** (device's system time is standard time). Automatic switchover between daylight saving time and standard time is not provided for in the default parameter set.
- 04 When the entries have been made, execute [Update date and time](#). Status messages (*Date and time updated / Update of date and time prohibited! / Update of date and time failed!*) are displayed briefly at the bottom of the screen. If the action fails, this is indicated by red text otherwise the new time setting is used.



The date and time can also be changed using enSuite ⇨ [Update date and time \(system time action\)](#) (p. 194)

The **Daylight saving box** can only be used if the following setting is parameterized in enSuite (branch: Basic System – Time Service, Daylight saving area, Daylight saving has the value manual).

(The **Time zone** can only be set using enSuite )

## NTP overview display

The final optional display entitled NTP overview is only displayed if NTP synchronization has been enabled in the device. Therefore it has to be parameterized in enSuite branch **Basic System – Time Service, parameter NTP**, see online help for more information. It will open after NTP overview has been selected in the **Main** display.

Time Service	NTP overview	15:07:56
Latest update	2018-10-12 14:04:11	
Latest deviation	-3590 s	
Server used	10.159.25.238	
Server stratum	1 (GPS)	
<a href="#">Update now</a>		

Fig. 7-25: Time Service – NTP overview display (optional)

This display provides the action [Update now](#) with NTP server synchronization.

Select “[Update now](#)” to view the current time information values from the parameterized NTP servers, regardless of the specified query interval. In addition, the following entries are displayed:

- Latest update: time stamp of the last time synchronization using NTP. If a synchronization has already been completed, the precise time of the synchronization can be read in the display (date, time and time zone).
- Latest deviation: The deviation (in seconds) at the last time synchronization using NTP shows by how many seconds the internal time deviated from the standard time at the last synchronization.
- Server used: name or IP address of the NTP server used for the last time synchronization, for example, ptbtime1.ptb.de or de.pool.ntp.org or company servers as in the figure.
- Server stratum: stratum value of the NTP server used for the last time synchronization (number of computers up to the time reference in the NTP hierarchy).

This display provides the action [Request time via NTP](#) for manual time synchronization via NTP. Further information is given in the figure above.

Following status messages can occur. Messages in red font indicate that the NTP time request was not successful and inform about the type of error.

**Successful.** The time was successfully requested of the NTP server, the system time might have been synchronized with the new time.

**No NTP server configured** Error in the parameterization The time request via NTP is activated (NTP: active), but no Server 1..Server 3 is parameterized.

**Name resolution error** The names of the NTP servers (Server 1..Server 3) could not be resolved via DNS. Possible causes: The DNS server is not available, e.g. because the IP address of the DNS server in the network settings (CPU or ESER4) is not correctly parameterized. The names of Server 1..Server 3 are not correct.

**Network error** Internal network error In this case, contact our support team.

**Stratum exceeded** Error in the parameterization. The maximum permitted NTP server stratum (Max. stratum) is exceeded by all parameterized Server 1..Server 3.

**Network timeout** The Timeout was exceeded in the time query of the Server 1..Server 3. Possible causes: Timeout selected too low or network error.

## 7.3.6 Display and operation

The user management only has one pre-defined display (**Main display**) for logging in and out of the device as users and rights are managed in enSuite. After a successful local login, the actions to accept or discard the parameter changes and to log out are displayed. In addition to this, the user who is logged in can change their password.

### Main display

Access:  Home –  System –  User

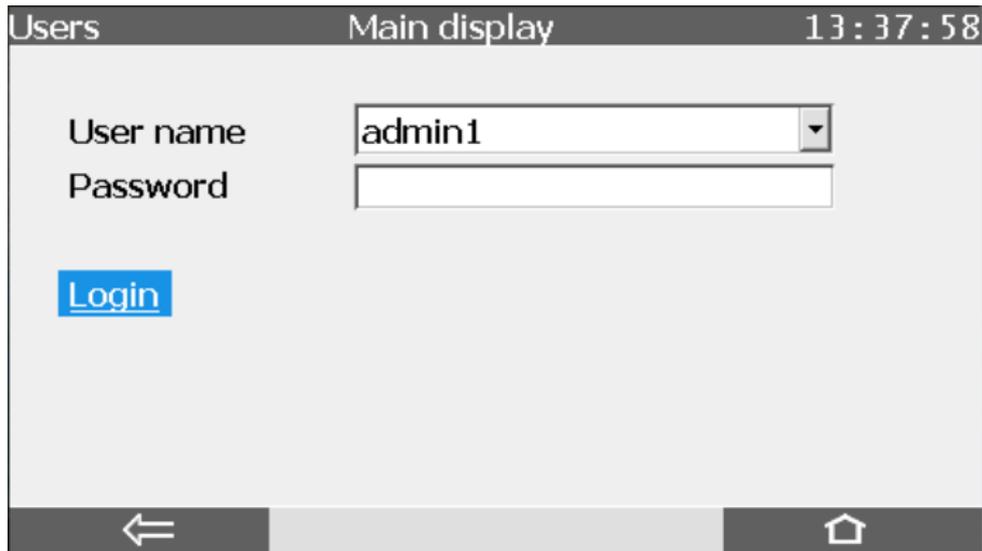


Fig. 7-26: Main display – Logging in to the device  
(Status:no user logged in)

#### Display view – status: no user logged in to the device

<b>User name</b>	<b>&lt;Name&gt;</b> Field pre-assigned with the name of the last login. If necessary, change the pre-assigned user name.
<b>Password</b>	<b>[*****]</b> For security reasons, in the display each character in the password is replaced by an asterisk (*); the field can also be empty.
<b>Login</b>	Action for log in to the device (user details set fields before) After this action the display changes the appearance ⇒ <a href="#">Logout</a> (p. 134)
<b>Remote operation panel active</b>	This warning is always shown when a user has access to the device's operation panel via remote connection and the remote user has enabled the local user to view the device. In this case, the following symbol is displayed locally in the status bar:   Otherwise, the local user sees a lock screen.

## Login

Access:  Home –  System –  User

Only one user can be logged in to the device exclusively at any one time, either the action Login will be displayed on **Users Main display** or the user name through which the action is logged.

If [Login](#) is shown select your **User name** (if not already shown) fill in your **Password** and choose this action, if not, read special cases below.

After successful login, a session is started, and only terminated again when you log out or logged out by others. You can navigate through the device depending on your authorizations ⇒ [8.2.5 User and rights management](#) (p. 201), you are able to change settings.

With the login the **Users Main display** changes its appearance and offers the possibility to logout ⇒ [Logout](#) (p. 134), to change parameters ⇒ [Perform parameter changes via displays](#) (p. 133) – and the password ⇒ [Change password](#) (p. 136).



### Special cases:

Another user is already logged in

The name of the user who is logged in will be shown, read the section ⇒ [Mechanisms to end exclusive access](#) (p. 134)

### Authorization mode Security switch is used

Parameter **Authorization mode** has the value **Security switch** and the security switch is open, only the field **User name** is displayed. In this mode the password is not required. (By default, <User name> and <Password> are required.) Parameter **Authorization mode** is set to **Password**) ⇒ [Rights at a system level](#) (p. 208)

## Perform parameter changes via displays

Changes are always made in three steps and are only saved if the user explicitly confirms this. If a user is logged out before confirmation, changes already made are discarded.

01 **Login** ⇒ [Login](#) (p. 133)

02 **Perform changes and actions in the various displays.**

Depending on your authorization, as long as you are logged in certain parameters will be displayed as editable fields and the associated actions as accessible hyperlinks. To save parameter changes, switch back to the **Main display** (System User) and perform the action Accept parameter changes, to discard parameter changes, perform the action Discard parameter changes.

03 **Logout** ⇒ [Logout](#) (p. 134)

## Mechanisms to end exclusive access

The device has the following mechanisms to prevent the device accidentally being blocked for further service activities:

- Parameter **Inactivity timeout**
- If there is inactivity, a user is automatically logged out after a parameterized timeout (default is **120 min**). Changes which have been made but not accepted will be discarded.
- The timeout takes effect for example if a user is logged in to the device remotely and ends enSuite without logging out of the device beforehand.
- (👤 **User**, tab **Parameter**, Parameter **Inactivity timeout**) ⇔ [General parameters](#) (p. 211)
- Automatic logout after an action has been carried out via enSuite
- If an action is carried out in enSuite that requires a user to be logged in, the user is automatically logged out at the end of the action. For example, this can be after a parameterization or a firmware change has been transferred to the device.
- Logout remote user manually
- For service activities on site, it is possible to manually log out a user who is remotely logged in to the device. Please note that the parameter changes made by the user who has been logged out will be discarded.
- (🏠 **System** – 👤 **User**, action [Logout remote user](#)).
- Closing enSuite or closing the connection to the device.

## Logout

Access: 🏠 Home – 🏠 System – 👤 User

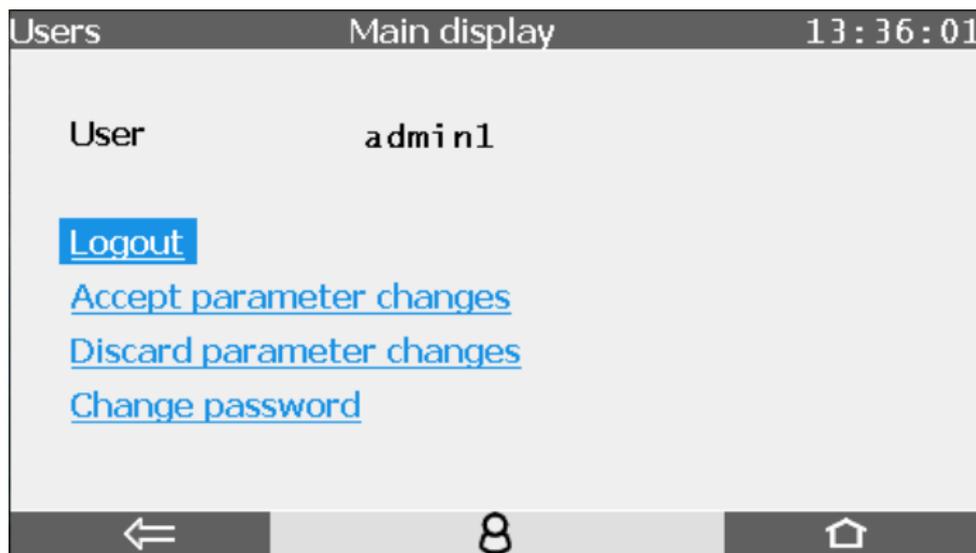


Fig. 7-27: Main display – User **admin1** is logged on

End your session with [Logout](#). The session is over. Other users can log in to the device. Always log out of the device manually as soon as you have made the desired changes. On the one hand, this prevents the device from unnecessarily being blocked for service activities of other users and on the other hand it prevents other users from using your session to make changes to the device with your user data.

Logout view – lines in overview	
<b>User name</b>	<Name>Name of the user logged in
<a href="#">Logout</a>	End the session and switches to ⇄ <a href="#">Login</a> (p. 133)
<a href="#">Accept parameter changes</a>	Save current parameter changes and enable them in the device.
<a href="#">Discard parameter changes</a>	Discard current parameter changes.
<a href="#">Change password</a>	Set a new password. Action switches to display ⇄ <a href="#">Change password</a> (p. 136)
<b>Remote operation panel active</b>	This warning is always shown when a user has access to the device's operation panel via remote connection and the remote user has enabled the local user to view the device. In this case, the following symbol is displayed locally in the status bar:   Otherwise, the local user sees a lock screen.

End the session of an user all ready logged in with [Logout remote user](#).

In this case the **Logout view** is displayed instead of the "**Login view**"and contains following lines:

Logout view – Status: A user is logged in to the device e.g. via enSutie.	
<b>Remote user</b>	<Name>Name of the user who is logged on and is currently performing an action.
Logout remote user	End the session of this user and switches to ⇄ <a href="#">Login</a> (p. 133). You discard all changes that the previous user has not saved yet.

## Change password

All users can change their passwords on **Users Main display** after successfully logging in to the device. → [Login](#) (p. 133)

Click the action Change password. The fields for the new password will be displayed:

Fig. 7-28: Main display – change password

You can make the keyboard appear by clicking the field **New password**. Then enter new password. Enter the same password in field **Repeat password** and save it with selection of Accept new password.

A short status message will be displayed briefly over the lower edge of the screen. Red font indicates that the password was not able to be saved, e.g. the passwords are not identical or not permissible.



### Permissible passwords

**When choosing a new password, note password policies!**

- A password can be made up of 3 to 10 permissible characters – empty passwords (0 characters) are also permitted.
- No distinction is made between upper case and lower case letters.
- All the letters from a through z (or A through Z) and the numbers 0 through 9 are permissible.
- Special characters such as `_`, `-`, `*`, `[`, `{`, `#`, `\` are not permissible.

## Unlock Password Lock for Older Devices

Until early 2019, devices were shipped with a Honeywell Administrator password. Since the administrator rights are transferred to the system operator, the factory-assigned administrator password must be reset for older devices.

Prerequisite(s)

- Navigation knowledge. ⇨ [7.2.3 Navigation options](#) (p. 108)

### Steps

- 01 Log in to the unit or remote control panel under  **System** –  **User**. Use the settings as shown..

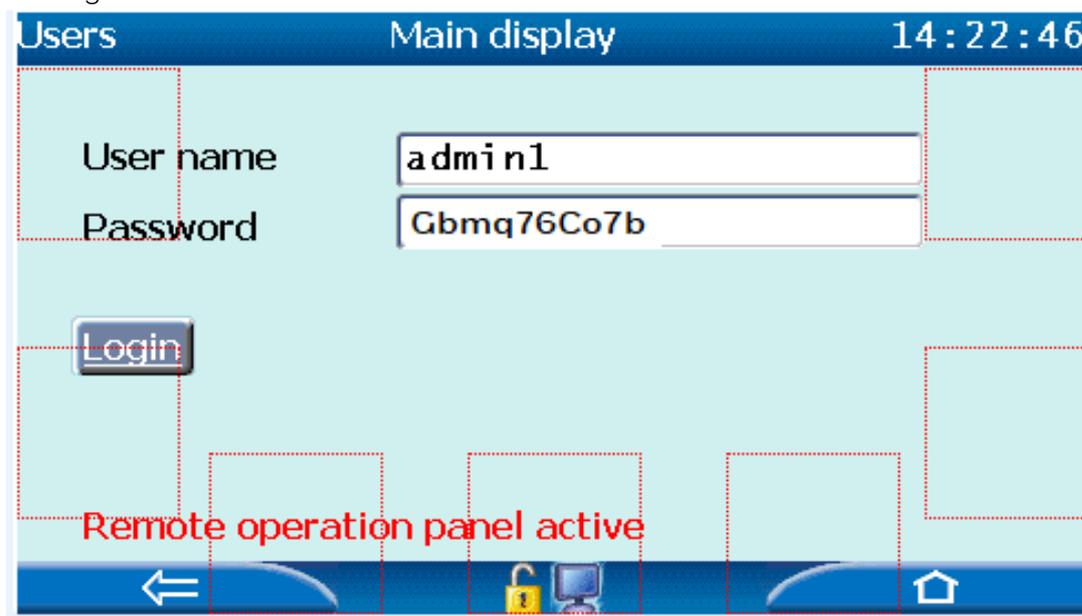


Fig. 7-29: Benutzer Hauptanzeige mit Werkspasswort

- 02 Navigate to the line **"Change password"**.
- 03 Do not enter any new passwords (no entry will delete the password)
- 04 Select **"Accept new password"**
- 05 Log off.



#### NOTICE

Password protection no longer exists.

Create new passwords immediately.

## 7.3.7 System display (Logbook)

The **Logbook** located under **Home** **System** **Logbook** is one of two device logs in which events during operation are stored as history. It is similar to an archive; each entry is assigned an ordinal number. The entries which have been removed from the **error list** ⇒ [7.3.3 Error List – Main display \(accept / quit error messages\)](#) (p. 123) can be found here with the same labeling of the time stamp.

The second is the **Audit trail** ⇒ [7.3.8 System display \(Audit trail\)](#) (p. 139) whose data is also stored in the **Logbook**.



The logbook ( Logbook error list, see the figure below) documents / saves incidents and thus logs the device operation. It cannot be deleted and contains up to 1000 data records. When the logbook is full, the next entry overwrites the oldest record.

The logbook records the coming and going of all messages (alarms and warnings). Each entry is assigned an ordinal number. The header also contains a timestamp with the exact calendar time when the entry was created.

The body contains the text with the information why the entry was created and starts with the name of the software part that caused the entry.

Like the error list, the content of the list of displayed logbook entries can also be filtered using the Filter drop-down list. If there are more messages than can be displayed at once, the scroll bar appears at the right edge. The following figure shows an example for displaying the logbook with the All filter selected:

Labeling of the time stamp	Meaning
↗ <Red text>	<b>Alarm</b> message begins
↘ <Red text>	<b>Alarm</b> message ends
↗ <Yellow text>	<b>Warning</b> message begins
↘ <Yellow text>	<b>Warning</b> message ends
Signals only appear once in the logbook and <i>not</i> when they begin and end.	
🚨 <Red text>	Signal of <b>Alarm</b> type
⚡ <Yellow text>	Signal of <b>Warning</b> type

Fig. 7-30: Error List – Logbook display-example

Whenever changes occur or an event is included in or removed from the Error List main display, this information is recorded in the logbook



To analyze large archive sections, it is more practical to read the archives using enSuite. ⇒ [8.5.1 Working with archives and logs](#) (p. 238)

## 7.3.8 System display (Audit trail)

The **Audit trail** is one of two device logs in which events during operation are stored as history. It is located under **Home** **System** **Audit trail**. The content is also stored in the other log. ⇨ [7.3.7 System display \(Logbook\)](#) (p. 138).



The audit trail distinguishes between "**General**" and "**fiscal**" because of the different type of archived data.

### General audit trail and fiscal audit trail

To open this: Home display **System** **Audit trail**

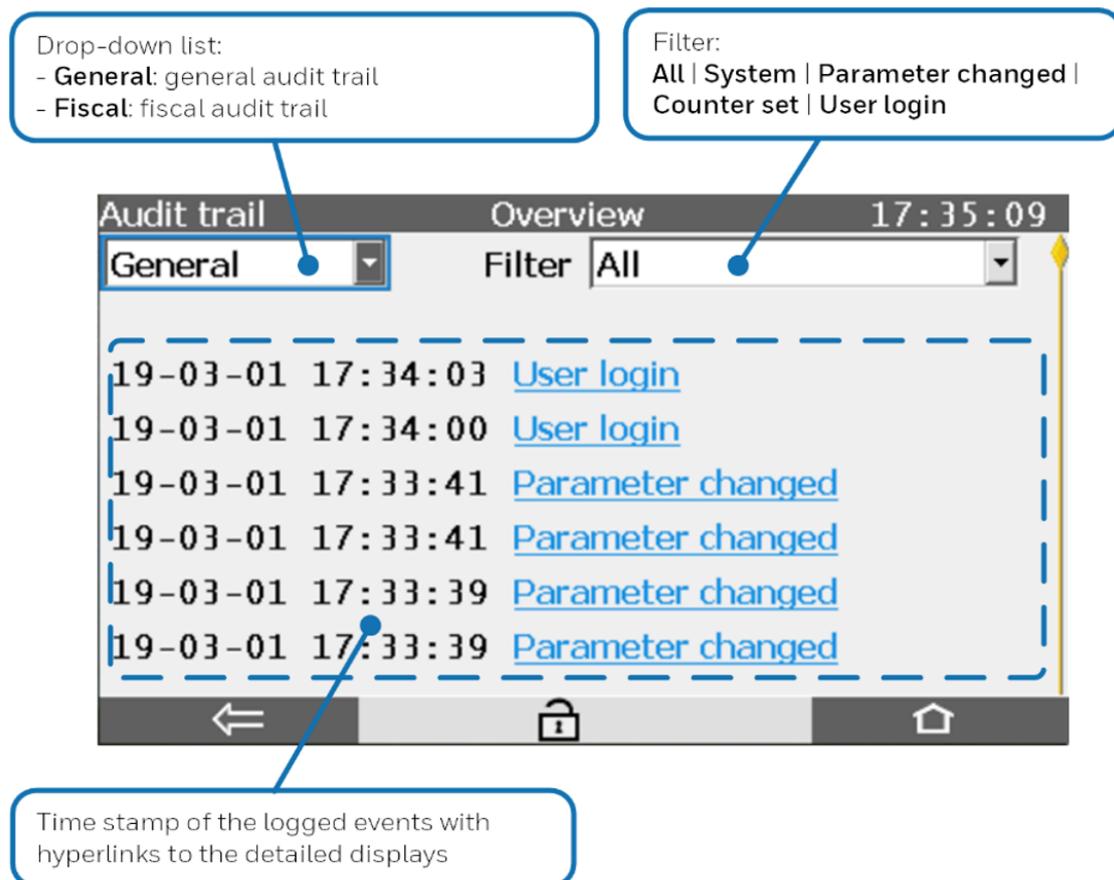


Fig. 7-31: Overview display – example



### Fiscal audit trail

The fiscal audit trail has the same structure as the general audit trail and is therefore not described in any further detail here

For the enCore FC device series, you will find a detailed description in the ⇨ enCore manual "Instructions for Use in Legal Metrology" for the respective device type.

### Audit trail entries

The audit trail has space for 1000 entries. **In the general section**, the oldest entry will be overwritten after 1000 entries have been created. If this space is occupied **in the fiscal section**, no changes can be made to the legally relevant parameters without opening the security switch (SSW).

The events recorded in the audit trail can be displayed more clearly with a filter in the right selection list. Activate the hyperlink behind the entry whose details you would like to view. The detail view for the entry appears.

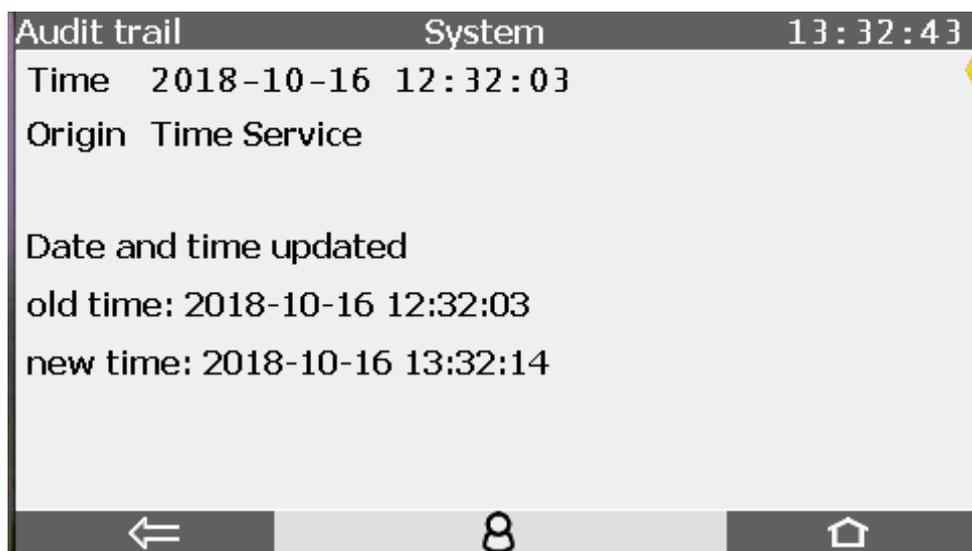


Fig. 7-32: Example of audit trail details



The type and scope of the displayed data depends on the situation and the settings in enSuite. If the SSW is opened, the entries can be deleted using the now displayed action to create space for new changes.

## 7.3.9 System display I/O (network settings / inputs/ outputs)



The I/O – Overview display lists all the device parts available on inputs or outputs and enables the user to go to other sub-displays using hyperlinks.

The hyperlinks and test mode function appear depending on the parameter set. A login is required to use the functions. ⇨ [7.3.6 Display and operation](#) (p. 132)

I/O	Overview	08:43:12
<a href="#">CPU3</a>	V03-34-A 1897	
1: <a href="#">Q2SENS</a>	1.2.0 ---	
2: <a href="#">Q2BASE</a>	1.0.5 6666 Test mode Off	

Fig. 7-33: I/O – Overview display

Using test mode, you can apply test values to individual output channels, which are used instead of the original values.

Hyperlink CPU3 is always available and enables the user to go to the Ethernet I/F display with the basic network settings.

### Ethernet I/F display with the basic network settings

Location : Home display – System – I/O - CPU3

I/O	Ethernet I/F	13:55:35
Board	CPU3 00:23:7E:FF:23:8A	
Configuration	fixed IP	
IP address	10.146.12.197	
Network mask	255.255.254.0	
Default gateway	10.146.12.1	
DNS server	165.195.30.99	
TCP port HTTP	80	
TCP port MMS	102	

I/O	Ethernet I/F	13:56:04
Configuration	fixed IP	
IP address	10.146.12.197	
Network mask	255.255.254.0	
Default gateway	10.146.12.1	
DNS server	165.195.30.99	
TCP port HTTP	80	
TCP port MMS	102	
Host name		

Fig. 7-34: I/O – Ethernet I/F display

As the example above shows, this display lists the internal board (CPU3) with its MAC address (00:23:7E:FE:04:17).

If a user with the appropriate authorization is logged in, the configuration (DHCP mode), IP address, network mask, default gateway, DNS server, TCP ports and host name can be changed. The number of entries which can be changed is also affected by the selected / pre-set settings.



If the user is not logged in or does not have the appropriate authorization, data can only be read in this display.

The setting of the IP address and the basic network settings can be made alternatively via enSuite ⇒ [8.2.1 SFB I/O \(IP address network- and I/O-settings\)](#) (p. 189). The enSuite online help explains the various settings in more details.

A logged in user with the appropriate rights, get following view, see the figure below.

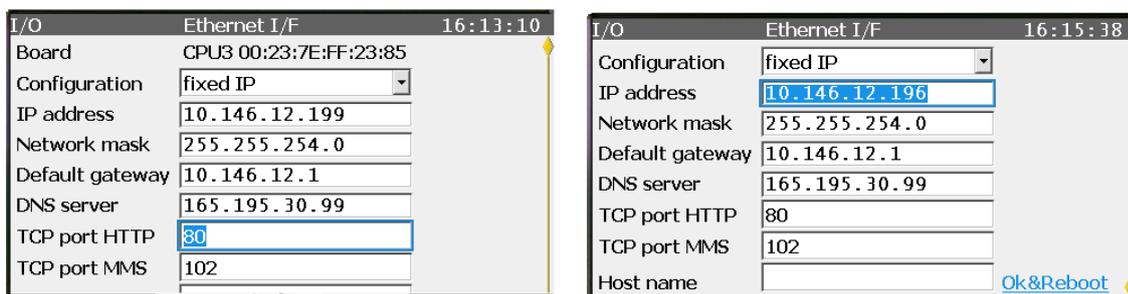


Fig. 7-35: I/O displays with options to make an entry and restart



#### PROHIBITION

- to change the settings of the Configuration (DHCP operation mode)

Change basic network settings:

- Make a note of the settings to be able to undo your changes if necessary.
- Select the entry you want to change. If necessary, ask your system administrator which parameters are to be changed. (With the selection the keyboard is shown)
- Enter the values specified (by the system administrator) field by field using the keyboard that appears.
- To accept the changes, the device must be restarted with the then appearing action **[OK&Reboot]** (see figure).

The changed data will be used after the reboot. If you exit the display with your changes will not be applied.

## 7.3.10 Display Q2 sensor values



Behind this symbol lies the list of sensor values.

As a rule, this display is only used for service purposes and to isolate faults.

Q2		Sensor values		12:09:49
Operation:	Analysis	Step:	Analysis	
UIR1			453.97 mV	
UIR2			1231.66 mV	
UIR3			598.05 mV	
UIR4			476.36 mV	
PI			1.0146 bar	
TSB			69.99 °C	

Fig. 7-36: Q2 sensor values display

A complete list of all sensor values is displayed in the following table:

Sensor signal	Use/Meaning	Sensor value range
UIR 1- UIR 4	For internal calculations only	Several 100 mV
PI	Pressure (ambient + measuring unit [approx. 160 mbar])	Ambient-dependent
TSB	Temperature of sensor block	approx. 70°C $\pm$ 158°F $\pm$ 343K
UW11 - UW22	For internal calculations only	Several 100 mV
PU	Ambient pressure (internal monitoring)	Ambient-dependent
TP	Circuit board pressure (internal monitoring)	Ambient-dependent
PW1, PW2	For internal calculations only	Several mW
TM1, TM2	For internal calculations only	Around 100°C
TB1, TB2		Around 68°C
TH1	Housing temperature (internal monitoring)	Ambient-dependent

## 7.3.11 Display Q2 control (calibration/verification/touch)



Clicking on this symbol leads to the following display which branches to functions “Calibration”, “Verification” and “Disable touch”.



**Calibration** enables you to branch into other calibration sub-displays.

**Verification** enables you to start the verification and to go to other branches.

**Disable touch** interrupts the device operation for a time displayed as it runs down behind the link. This prevents, for example, errors with a limited time during inspections or service work.

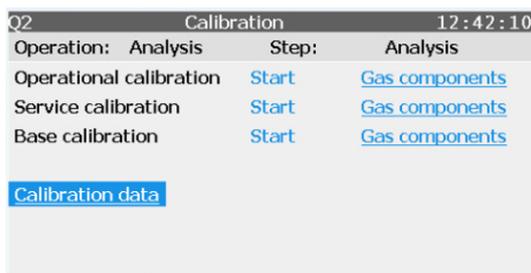


Fig. 7-37: Control display with sub-displays



"Operational calibration"

⇒ [7.4.2 Operating mode: Operational calibration \(manual\)](#) (p. 162).

"Service calibration"

⇒ [10.3.11 Completing a service calibration](#) (p. 270)

For branches and function of "Verification"

⇒ [7.4.3 Operating mode: Verification \(special mode\)](#) (p. 165),

Displays and functions for " Base calibration " are not described here (basse calibration only takes place before delivery at the Honeywell factory)

The Calibration data display lists internal instrument values and deviations from previous settings caused by the operating calibration

Q2		Calibration data		13:45:44
Operation:	Analysis	Step:	Analysis	
PI_GAIN		1.001600E00		
TB_OFFS		-2.135900E00	K	
DT_OFFS1		-1.414800E01	K	
DT_OFFS2		-5.247800E00	K	
PW_OFFS1		2.027679E-06	W	
PW_OFFS2		-1.504908E-06	W	
...	...	...	...	

Fig. 7-38: Q2 – Calibration data (Sub-display of Calibartion display)

The **display of the calibration values** is not required in everyday operation. It is for service purposes only and may help troubleshooting work.

In the **Gas components displays** you can view the gas composition of all calibration gases used. The following figure shows an example of the operational calibration gas. If you have the appropriate rights, you can also make changes here, e.g. to the composition of the company calibration gas.

Q2		Operational calibration gas		13:46:44
Operation:	Analysis	Step:	Analysis	
Ref. gas	2% CO2 / 98 % CH4			
Name	-			
ID	-			
Inlet	Inlet CAL			
CH4	0.0000 mol%			
N2	0.0000 mol%			

Fig. 7-39: Q2– Gas components (Sub-display of Calibartion display)

The displays for the gas components are only required when the gases are changed and are explained in more detail in section [7.4.2 Operating mode: Operational calibration \(manual\)](#) (p. 162).

## 7.3.12 Q2 main display (calculation standard)



This symbol takes you to the Q2 main display (display when the devices started set at the factory). Alternatively, you can use the  button (home display bottom right)

\* The button will take you to the parameterized basic display, in delivery condition, this is the main display.



If other displays are not used within a previously defined period (⇒ [Define basic display and edit display behavior](#) (p. 200)), Q2 will automatically return to this display. New measurement results are always displayed here in a table.

The following figure shows the appearance of the display at the end of the start-up process with an extra line for the temperature of sensor block (TSB) and then for the start delay (seconds) during which the boxes for the measurement results will be filled with question marks.

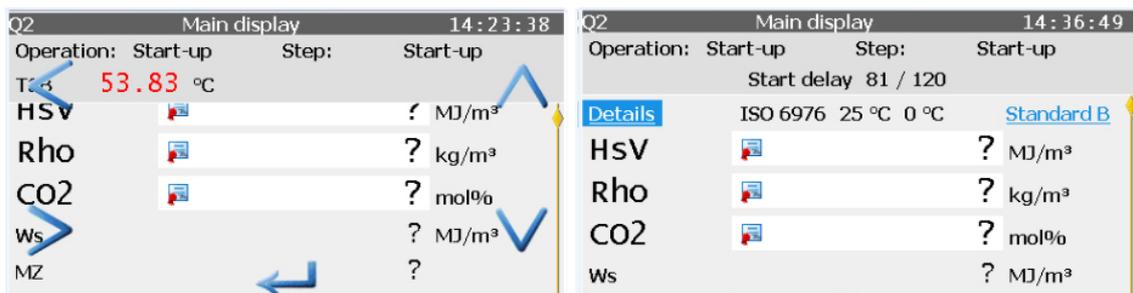


Fig. 7-40: Q2 main display (during start-up)

After the start-up process has been finished, the measurement results boxes show values in black. If red entries are shown, an error has occurred. (Red entries only with the appropriate parameter settings ⇒ [8.3 Notices about parameterization](#) (p. 228).



The appearance of the display depends on the parameterization. In addition to “Details”, the line above the results shows the current standard and the selected settings. Generally, this will be standard A.

If parameterized (examples on the following pages) a link will appear to the right of it for the second available standard (standard B). In this case, you can switch between the standards using the superimposition keys.

Below is an example of the appearance of the main display with the default parameter set. The calculation standard (standard A) with the standard states is shown above the results in the center. A default calculation standard and the units are set.

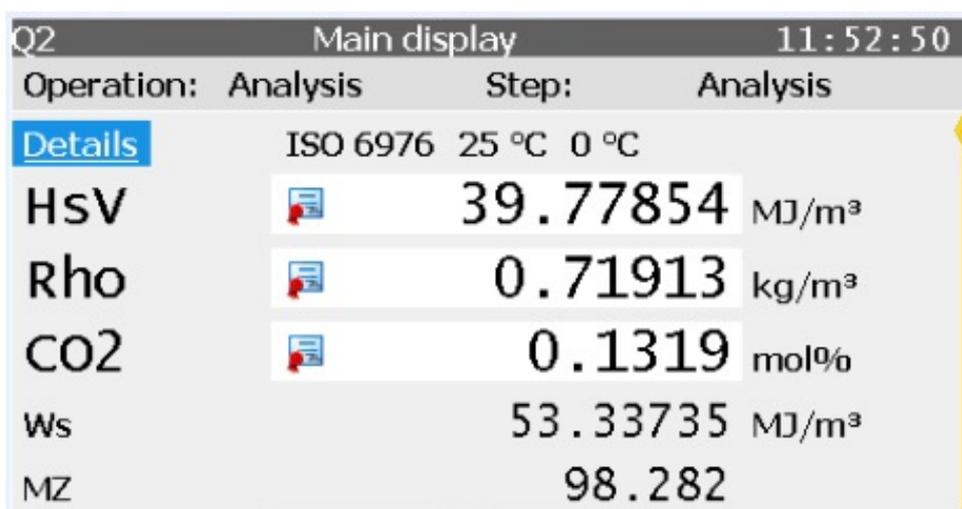


Fig. 7-41: Q2 main display (default parameter set)

The operating mode is specified under the name of the display next to “Operation”. The user can adopt for operating modes. The current step being undertaken by the device is shown next to “Step”. Standard operation comprises six steps. The following combinations are possible:

Operation	Step	Meaning
Start/Start-up (7)	Start/Start-up (22)	Device in starting phase (start-up)
Analysis (1)	Flush (19)	Clean the gas routes with measuring gas
	Analysis (18)	Normal measuring mode, recording measurements
Operational calibration (2)	Start (0)	Wait for confirmations before starting an action
	Flush (19)	Clean the gas routes with measuring gas
	Gas 1 (1)	Recording measurements, calibration gas
	End (14)	Wait for confirmations before ending or cancelling an action
Verification (5)	Start (15)	Wait for confirmations before starting an action
	Flush (19)	Clean the gas routes with measuring gas
	Verification (16)	Recording measurements/Verification
	End (17)	Wait for confirmations before ending or cancelling an action

Operations and steps are displayed as export values, for example, in a Modbus list, indicated by the figures in brackets (Modbus numbers) since the clear text is not output here.



Further details of the executed “operations” and “steps”, which may vary slightly depending on the software version, will be provided later in this document.

The states shown in the following can also be recorded outside normal operation using the Modbus numbers.

These only occur during the base calibration at the factory, during Honeywell service work or in the event of errors and are therefore not described in further detail here.

Operation	Step	Meaning
Idle (0)	Idle (20)	Device in idle state
Service calibration (3)	Confirm 2 (2)	Wait for confirmations by user
	Gas 2 (3)	Recording measurements, calibration gas 2
	Confirm 3 (4)	Wait for confirmations by user
	Gas 3 (5)	Recording measurements, calibration gas 3
	Confirm 4 (6)	Wait for confirmations by user
	Gas 4 (7)	Recording measurements, calibration gas 4
	Confirm 5 (8)	Wait for confirmations by user
	Gas 5 (9)	Recording measurements, calibration gas 5
	Confirm 6 (10)	Wait for confirmations by user
Base calibration (4)	Gas 6 (11)	Recording measurements, calibration gas 6
	Confirm 7 (12)	Wait for confirmations by user
	Gas 7 (13)	Recording measurements, calibration gas 7
	Confirm 8 (24)	Wait for confirmations by user
	Gas 8 (25)	Recording measurements, calibration gas 8
	Confirm 9 (26)	Wait for confirmations by user
	Gas 9 (27)	Recording measurements, calibration gas 9
	SAVE_CAL_DATA (28)	Save the calibration data
Error (6)	Error (21)	The device is not functioning correctly, see error list
	Step error/Failure (23)	

If parameterized, it is possible to display another standard and switch between the standards, therefore the appearance of the appropriate line varies, see following examples with 2 calculation standards.

Q2 Main display		15:21:22		Q2 Standard B		15:22:10	
Operation:	Analysis	Step:	Analysis	Operation:	Analysis	Step:	Analysis
<a href="#">Details</a>	ISO 6976 25 °C 0 °C		<a href="#">Standard B</a>	<a href="#">Details</a>	ASTM 3588 14.696 psia		<a href="#">Standard A</a>
Hsv	39.83089 MJ/m <sup>3</sup>			Hsv	37.70610 MJ/m <sup>3</sup>		
Rho	0.71748 kg/m <sup>3</sup>			Rho	0.67852 kg/m <sup>3</sup>		
CO2	0.0000 mol%			CO2	0.0000 mol%		
Ws	53.46902 MJ/m <sup>3</sup>			Ws	50.66332 MJ/m <sup>3</sup>		
MZ	98.158			MZ	119.191		

Fig. 7-42: Examples for the appearance of the main display with 2 calculation standards

In the center is the current standard with the standard states. In this example, it is standard A ISO 6976 25°C 0°C. A link to the alternatively selectable standard appears to the right, in the example Standard B.

Activate the link using the superimposition keys, this will change the display as follows:

- Text Main display changes to Standard B, and indicates that the figure to the side is displaying results using standard B.
- In the middle of the second line the standard B with the standard states is now named in the example, it is ASTM 3588 14.696 psia.
- To the right the link Standard A is shown, which enables you to switch back again.



For information about changing or extending this setting see [⇨ 8.3 Notices about parameterization](#) (p. 228)

These control and information lines are followed by the measurement and calculation values (results).



The values displayed are only valid if the system is in analysis mode and has not suffered an error. This means that no sensor alarm is active, and both “Operation” and “Step” read “Analysis”.

If the value is monitored, this is also shown clearly by a display in black text. The rule of thumb is: There is no alarm active if the status LED is permanently on.

The following is shown in the Q2 main display:

Displayed value (abbreviation)	Meaning (of the value abbreviation)/Physical quantity	Displayed result...
HsV (in large letters)	Superior calorific value; based on volume	
Rho (in large letters)	Density at base conditions	... in the preset unit
CO <sub>2</sub> (in large letters)	Carbon dioxide	
Ws	Superior Wobbe index	
MN	Methane number	...Dimensionless

Calculated gas analysis with 10 components and the total of the C<sub>2</sub>+ components

Displayed value (abbreviation)	Meaning (of the value abbreviation)/Physical quantity Displayed result in mol%
CH <sub>4</sub>	Methane
N <sub>2</sub>	Nitrogen (gas component)
C <sub>2</sub> H <sub>6</sub>	Ethane
C <sub>3</sub> H <sub>8</sub>	Propane
nC <sub>4</sub> H <sub>10</sub>	n-butane
iC <sub>4</sub> H <sub>10</sub>	Isobutane (i-butane)
nC <sub>5</sub> H <sub>12</sub>	n-pentane

Displayed value (abbreviation)	Meaning (of the value abbreviation)/Physical quantity Displayed result in mol%
iC <sub>5</sub> H <sub>12</sub>	Isopentane (i-pentane)
C <sub>6</sub> H <sub>14</sub>	Hexane
C <sub>7</sub> H <sub>16</sub>	Total heptane
C <sub>8</sub> H <sub>18</sub>	Total octane
C <sub>9</sub> H <sub>20</sub>	Total nonane
C <sub>10</sub> H <sub>22</sub>	Total decane
CH	Total of all hydrocarbons
C <sub>2</sub> <sup>+</sup>	∑ ethane + all higher hydrocarbons
C <sub>6</sub> <sup>+</sup>	Hexane ∑ + all higher hydrocarbons

The first element that can be selected in the control and information lines is the “Details” button. It allows intermediate results to be viewed in another display.

Once again, the selection and activation is done using the superimposition keys.

The Q2 standard details display shows intermediate results for the selected calculation standard. The following examples show the appearance of the display after branching with details:

Standard A details		Standard B details	
Operation: Analysis	Step: Analysis	Operation: Analysis	Step: Analysis
ISO 6976 25 °C 0 °C		ASTM 3588 14.696 psia	
Part. wet		Part. wet	
Hs	890.63000 kJ/mol	Hs	891.50479 kJ/mol
HsV	39.83089 MJ/m <sup>3</sup>	HsV	37.70610 MJ/m <sup>3</sup>
HsM	55.51518 MJ/kg	HsM	58.63098 MJ/kg
Li	802.60000 kJ/mol	Li	802.70738 kJ/mol

Fig. 7-43: Q2 – Standard A details/Q2 – Standard B details

The line with the details of “Operation” and “Step” is also displayed here. The next line contains the calculation standard in double size. Values are calculated for partly saturated, dry and humid gas for the set reference status.



The superior/inferior calorific value changes if the gas contains water vapor. Depending on the quantity, a distinction is made between dry and partially saturated or saturated (humid).

Values for the partly saturated or humid gas are lower than for dry gas since water vapor and combustion gas components divide the volume.

Specified water vapor saturation values in the superior/inferior calorific value results for three assumed states (dry/humid/partly saturated) are used in the calculation method.

The actual water vapor content must be calculated, for example, from humidity or dew point measurements.

The following values can be found in the sub-display Details of the main display:

Displayed value (abbreviation)	Meaning (of the value abbreviation)/Physical quantity
Hs	Superior calorific value; molar
HsV	Superior calorific value; based on volume
HsM	Superior calorific value; based on mass
Hi	Inferior calorific value; molar
HiV	Inferior calorific value; based on volume
HiM	Inferior calorific value; based on mass
Zb	Compressibility factor at basis conditions
Ws	Superior Wobbe index
Wi	Inferior Wobbe index
d	Relative density
Rh	Density at base conditions
M	Molar mass (of the mixture)
MN	Methane number



To see all the calculations, you must once again use the superimposition keys as the display is too long to be shown in full.

You can only change to the details of another standard using the main display.

### 7.3.13 Display User archives



This symbol takes you to the main display of the User Archives AFB, which can be used by multiple devices, in other words, also by the GasLab Q2.

The following figures and explanations are only examples, further information and the actual set-up takes place using enSuite. ⇔ [8 Configuration and analysis software enSuite](#) (p. 169)

The main display contains two drop-down list boxes. Using these, you can select the archive group and then select the archive channel. All the parameterized user archives in the enCore device are available. After making your selection, you can go to a detailed display “Values” using the Show values link.

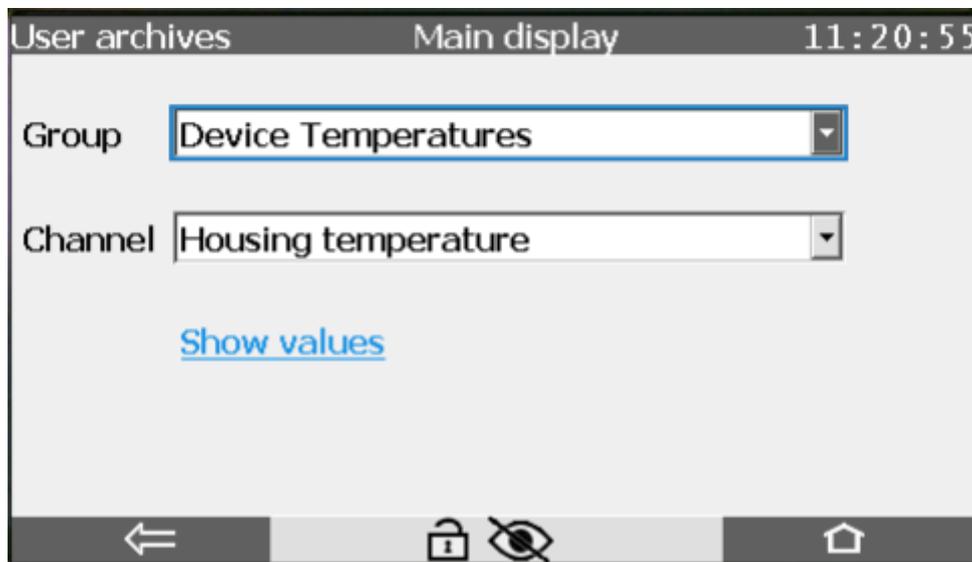


Fig. 7-44: User archives main display

The following functions and information are available in the displays:

- Channel (switch to other group channels)
- Delete content (not possible)
- Time stamp (date of archive entry)
- Ordinal no. (automatic identification number)
- Value (archived measurement or calculation result)

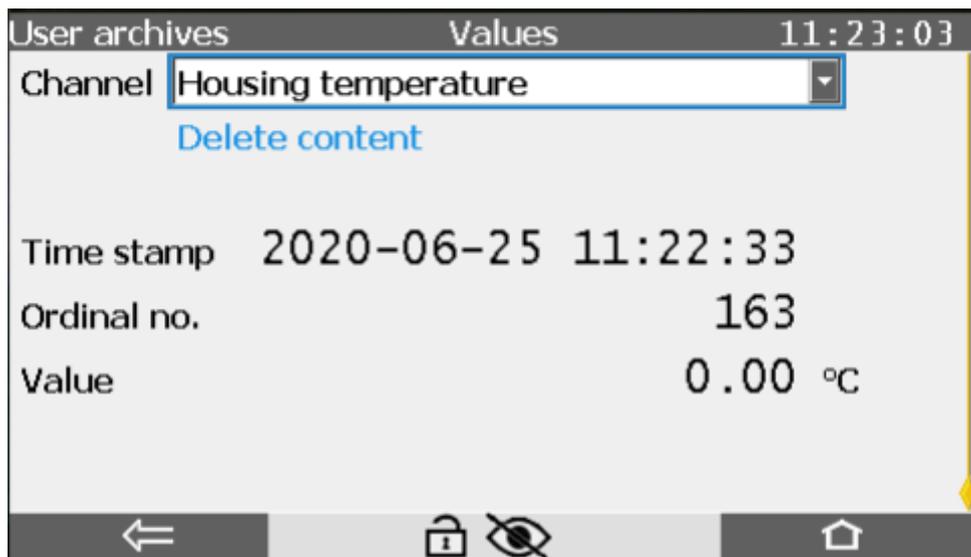


Fig. 7-45: Values sub-display

It is also possible to delete the content of the archive. A login with the appropriate rights is required for this.

The archive can be cleared if the Delete content link is underlined, see the two examples

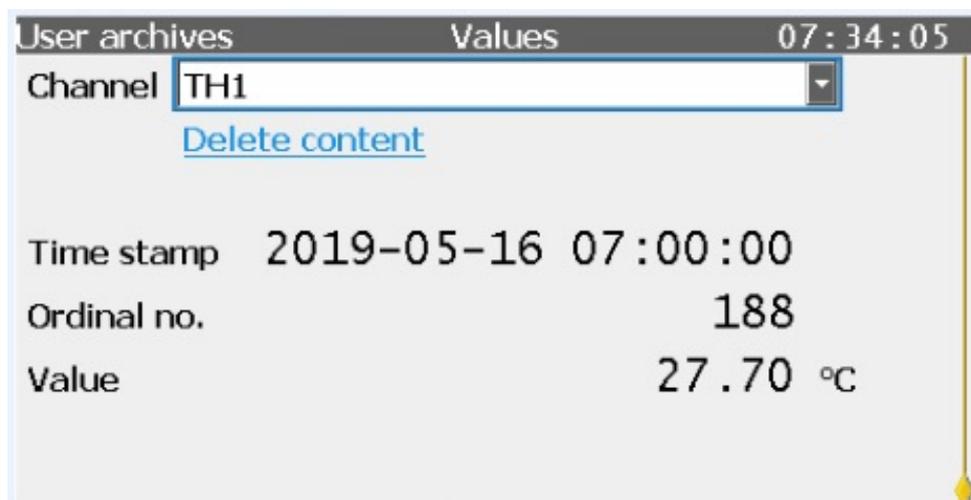


Fig. 7-46: Values sub-display (Delete content)



Documents for the enCore flow computer (⇒ [www.docuthek.com](http://www.docuthek.com)) also contain information about this general data management

## 7.3.14 Display Modbus



This symbol takes you to the main display of the Modbus AFB which can be used by most enCore devices and also by the GasLab Q2

The following figures and explanations are only examples, further information and the actual set-up takes place using [8 Configuration and analysis software enSuite](#) (p. 169).

### Displays at a glance

The following figure shows the hierarchical structure and the navigation through the displays of the Modbus AFB:

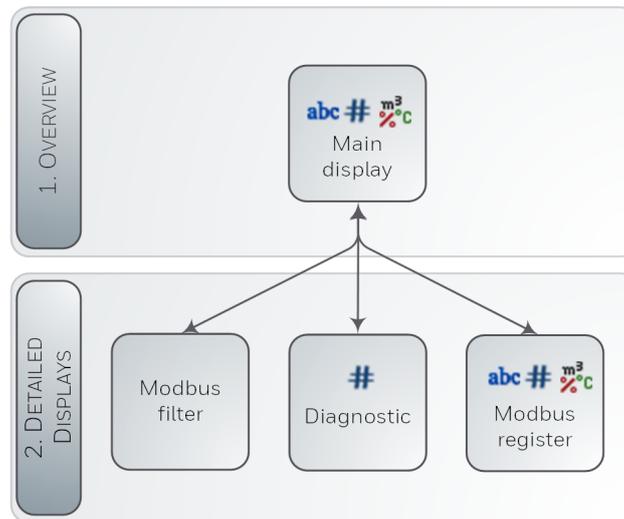


Fig. 7-47: Display – hierarchical structure

### Displays in detail

The **Main display** of the Modbus AFB provides you with an overview of all (parameterized) Modbus areas of the enCore device and lists (in ascending order) all associated registers for the selected area. From here you can switch to a diagnostics display. Optionally, you can select filters to specify the results list and you can switch to a detailed display for each register.

## "Main display"

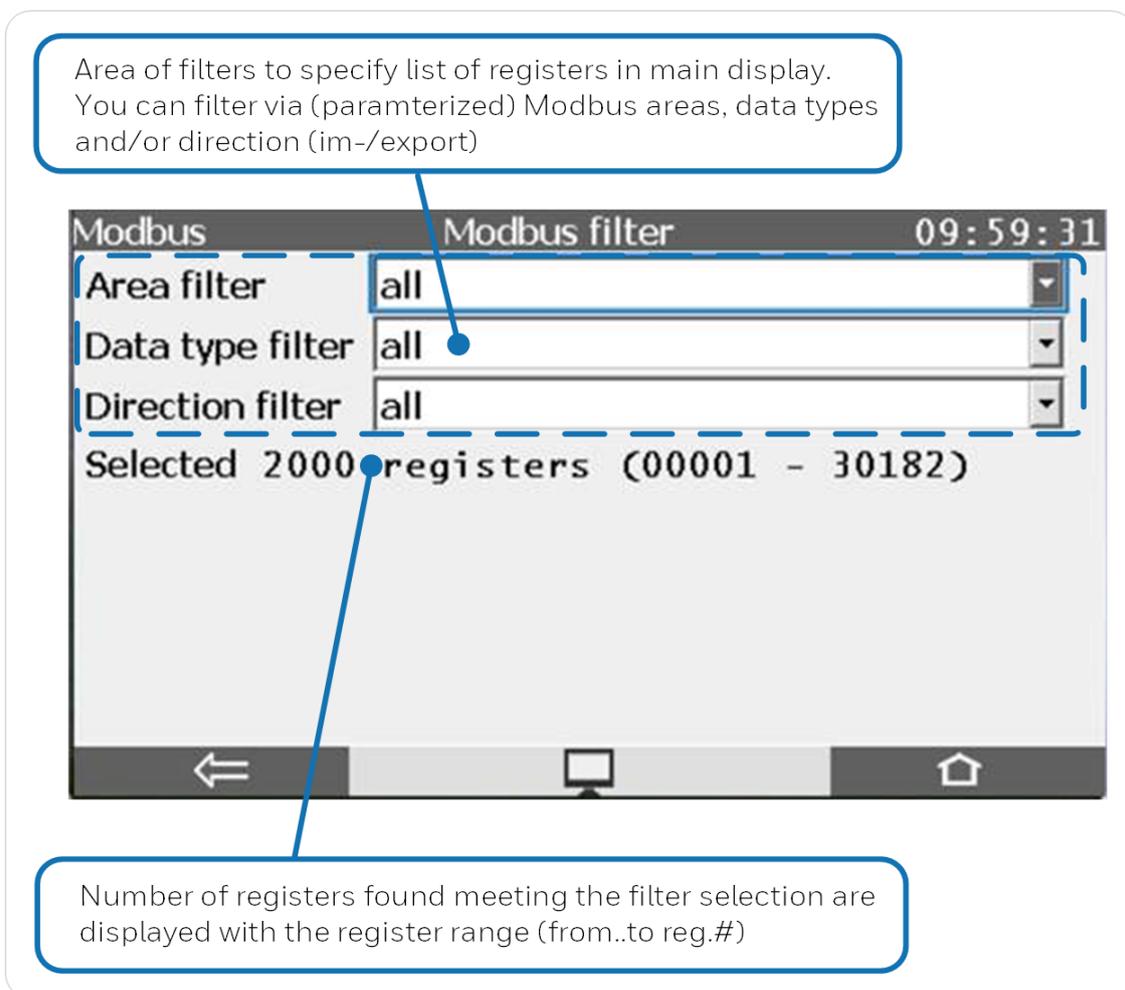
The screenshot shows the Modbus Main display interface. At the top, it displays 'Modbus Main display' and the time '15:23:09'. Below this is a dropdown menu for 'Local device'. A callout points to this dropdown with the text: 'Selection via (parameterized) area name'. Below the dropdown, it says 'No filters selected'. A callout points to this text with the text: 'Hyperlink <Selected filter> to specify Modbus filter'. Below this is a section for 'TC: 4905' and 'Reg.#: 0'. A callout points to the 'Reg.#' field with the text: 'Jump to reg.#'. Below this is a scrollable list of registers with their values and units. A callout points to this list with the text: 'Area lists selected registers (scrollable) with information to:'. Below the list, there are three callouts explaining the list's content: 'Telegram Counter of selection; Hyperlink to view Diagnostic', '1. Hyperlink <Reg.#> to details of Modbus register', '2. <Data object>: transmitted value formatted', and '3. The characters -, \, | and / are used to simulate a kind of turnstile that changes by a step each time the individual im- or export register is transmitted successfully.'

Reg.#	Value	Unit	Character
00001	123.449997	bar	\
00002	6789.100098	bar	\
00011	333.000000	bar	
00012	444.000000	bar	
00021	11.000000	bar	
00022	22.000000	bar	

Fig. 7-48: Modbus Main display – example

- ❶ For Modbus master or client the dropdown list contains all parameterized **Remote devices**; for slave or server only the entry **Local device** is available
- ❷ The text **No filters selected** is displayed in case no filter from the display **Modbus filter** is active; otherwise the all selected filters are displayed instead.
- ❸ If the register number does not exist or if no register is found due to the current filter selection, the AFB jumps to the nearest displayable register number.

## Display "Modbus filter"

Fig. 7-49: Display **Modbus filter** – example

### Display "Diagnostic"

This display provides diagnostic information of the selected area (not from function diagnostics 0x08):

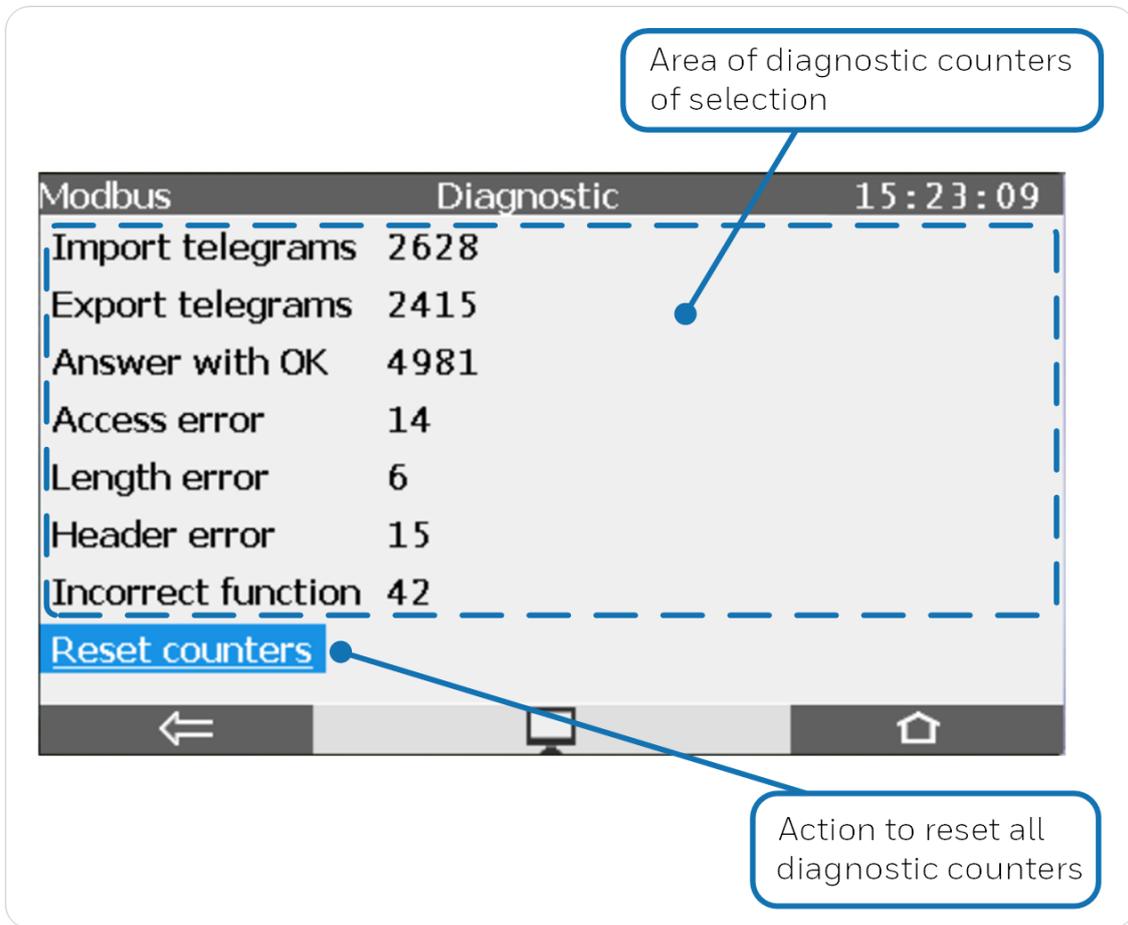


Fig. 7-50: Display **Diagnostic** – example

Error counters are only displayed, if they are not null (0), max. value is 999.999.999. Following error counters are supported:

#### All Modbus types:

- **Access error**  
Accessing (read/write) protected register(s) while password is still locked.
- **I-range error**  
For import data with range checking, the intended write value from telegram is outside the set range.
- **Length error**  
For writing into device registers, the size of data received from telegram differs from the total size of Modbus registers to be written.

**Client and master:**

- **Error responses**  
Received telegram(s) with error response
- **Checksum error** (*master only*)  
Received telegram(s) with wrong checksum
- **Header error**  
Telegram(s) with unexpected function or (*master only*) unexpected command
- **Reception timeout**  
Response time is up.
- **ID error** (*master only*)  
Received telegram(s) with wrong ID
- **Register not found**  
ACK telegram received but either total number of written registers or first register is not correct.
- **Sending error**  
Sending telegram failed.

**Server and slave:**

- **Access error**  
Write request for export register
- **Header error** (*server only*)  
Total number of bytes specified in header is incorrect.
- **Checksum error** (*slave only*)  
Received telegram(s) with wrong checksum
- **Incorrect function**  
Request telegram with unsupported function
- **Register not found**  
Requested register(s) not available
- **Sending error** (*server only*)  
Internal data cannot be written due to program errors.

## For simultaneous write area:

- **Access error**  
Register not in intended area
- **Length error**  
Data size for writing the value of a single register is not 16 bits.
- **Register not found**  
Incorrect register number, or the number of registers to be written differs from total number of registers in the area.

## Display "Modbus register"

**1**

Switch test mode: **on/off**  
 When test mode = **on**, then you can enter a **Data object** (**2**).  
 Prerequisite: authenticated user is logged in

Modbus	Modbus register	14:36:27
Test	off	
Area name	off	
Register name	on	
Register no.	00001	
Register content	01000000	
<b>2</b> Data object	1	
Last refresh	06.03.20 14:35:08	

Area with detailed information of selected im- or export register.  
 Whereby:

- **Register content** contains the transmitted value (hexadecimal)
- **Register object** contains the transmitted value formatted with unit.

Fig. 7-51: Display **Modbus register** – example

- 1** The test mode is available for all export registers except the data types **Export date and time**, **Monoflop register** and **Sequence number** (for archive areas).  
 The user right **Change general system settings** is required.

#### Checking export registers on the device

With the AFB, it is possible to check individual export registers directly in the device display – apart from data types **Export date and time**, **Monoflop register** and **Sequence number** (for archive areas).

As soon as you log in to the device as a user with the user right **Change general system settings**<sup>1</sup>, you can activate or deactivate the test function.

<sup>1</sup> You can find the setting for the authorization in the parameterization under <Device> – Basis System –  Users – Special user rights.

## Steps in enSuite

### Prerequisite(s)

- You are logged in as a user with the user right **Change general system settings**.

To activate the test of an export register, ...

- ... switch to the detailed display of the desired export register via **Modbus – Main display**.
- In the **Modbus register** display, the **Test** line is displayed as a drop down list.
- Select the entry **on** in the drop-down list.
- The test mode is active and the value for the **Data object** can be edited. The text **Data object** is displayed in red font color during the test mode.

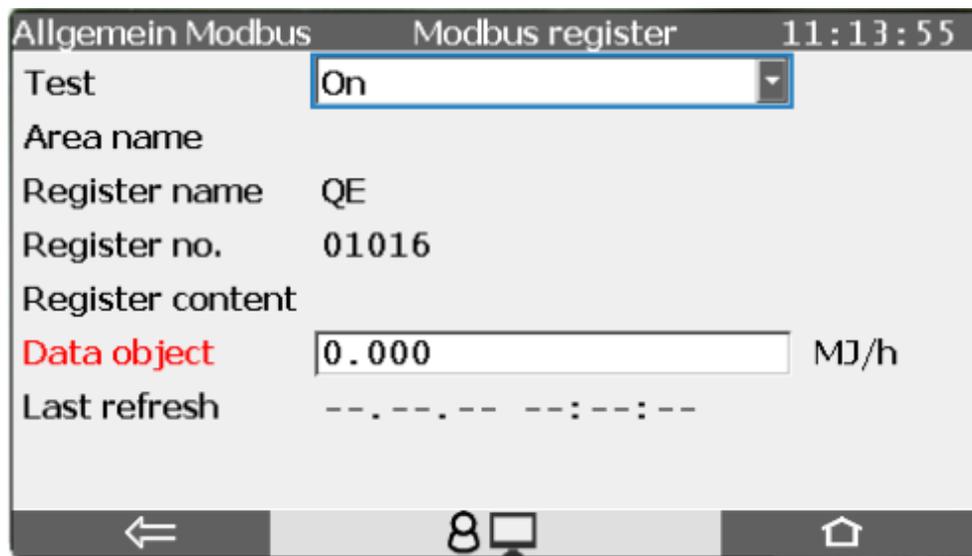


Fig. 7-52: Test function active for selected export register

- In the **Data object** field, enter the desired value that you want to simulate and confirm your entry with the button ✓. The value ranges vary depending on the register type and assigned format.
- The specified value is provided via Modbus until you enter a new value or end the test function.



### Exit of test function

The test function ends in the following cases:

- As soon as you navigate to another page in the display, for example, to simulate the value of another register.
- Logoff of the user, for example, due to the inactivity timeout.
- After a restart of the enCore device.

## 7.4 Operation and operating modes of GasLab Q2

The aim of this section is to explain more details of operation, operating modes and device functions. First of all, the observation of the device functions and normal operation are presented, which requires no or little action from the operating personnel. This is followed by operating instructions for more complex operating modes and functions, for example, calibration.

### 7.4.1 Operating mode: Analysis (automatic normal operation)

After connecting the power supply and reaching operating temperature, the measurement will take place every second in an endless loop in the continuous flow. The gas flow can be identified on the float flow meter. The Q2 main display will be visible on the device and on the remote operation panel. "Analysis" will be output as the operation and step on the display. Values will be displayed in black text. The two LEDs will be permanently lit.

Apart from intervention by the operator, the analysis will only normally be interrupted by the automatic operational calibration.



#### **NOTICE AVIS**

GasLab Q2 must perform an operational calibration at least once per week. This normally runs fully automatically

*Le GasLab Q2 doit effectuer un étalonnage opérationnel au moins une fois par semaine, ce qui se fait normalement de manière entièrement automatique.*

⇒ [8.4.1 Setting or changing automatic measurements](#) (p. 235)

## 7.4.2 Operating mode: Operational calibration (manual)



The last valid gas property values are held throughout the calibration time using measurement outputs. The parameters from the last successful calibration remain in use until a new successful calibration has taken place. Errors will be displayed on the device and documented in the “Error List”.

### Prerequisite(s)

- The device is in automatic normal operation (Analysis).
- Sensors are in the measuring range. (no alarm / no warning)
- Calibration gas cylinder is properly connected and ready for use
- You are logged in with the necessary rights. ⇔ [Login](#) (p. 133)

## Steps

01 Go to:

Home  -> Control ->  Calibration .

02 After a change in the parameterization or with a new calibration gas, click on "**Gas components**" in the "**Operational calibration**" line.

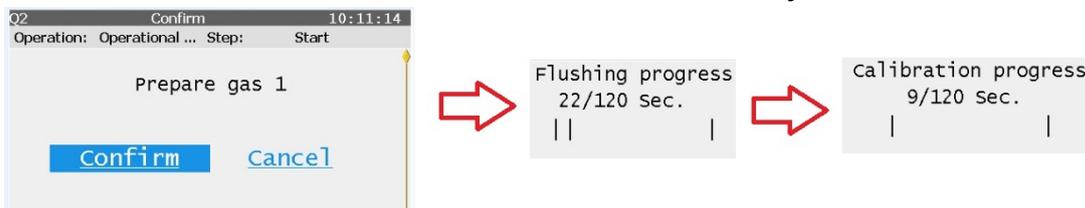
Q2 Calibration 12:42:10			Q2 Operational calibration gas 09:48:59		
Operation:	Analysis	Step: Analysis	Operation:	Analysis	Step: Analysis
Operational calibration	Start	<u>Gas components</u>	CH4	100,0000	mol%
Service calibration	Start	<u>Gas components</u>	N2	0,0000	mol%
Base calibration	Start	<u>Gas components</u>	CO2	0,0000	mol%

Check or correct the calibration gas mixture using the manufacturer's analysis certificate. See ⇨ [7.2.6 Entries and changes using the operation panel](#) (p. 111)

03 Activate "**Start**" in the "**Operational Calibration**" line  
(only possible if all requirements are met)

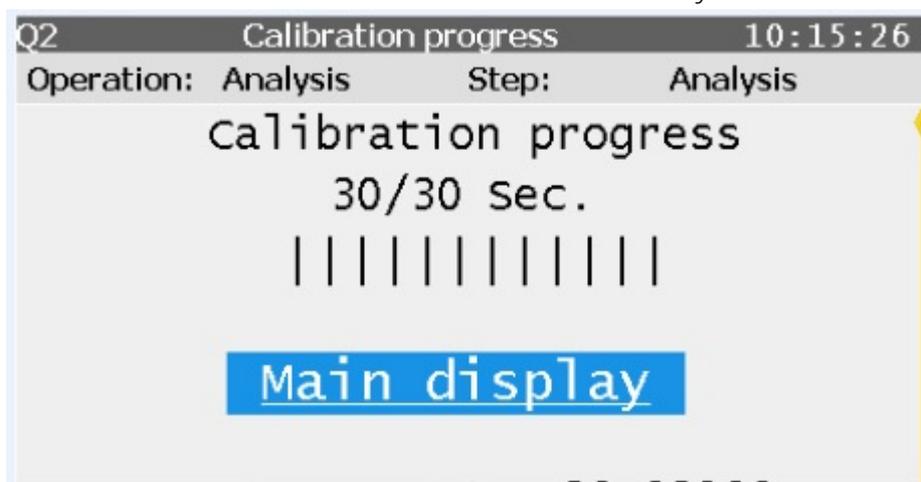
Q2 Calibration 12:42:10			
Operation:	Analysis	Step:	Analysis
Operational calibration	<u>Start</u>		<u>Gas components</u>
Service calibration	Start		<u>Gas components</u>
Base calibration	Start		<u>Gas components</u>

04 Click on "**Confirm**". The procedure now runs automatically, the warning "**Operational Calibration**" is active during this time. By selecting "**Cancel**" you can end the calibration at any time.



05 First of all, the system is flushed with the calibration gas mixture. This will be displayed throughout the duration of the process. The operational calibration gas will then be measured. The duration of this process will also be displayed.

06 After the display time has elapsed, the calibration will be finished and analysis mode with measurements will be continued automatically.



07 Click on the displayed **“Main display”** button to view current analysis values from normal operation again.



Abort by error or manually

If an error occurs, e.g. the pressure is inadequate, the message "Calibration step failed" is displayed. Press the "Cancel" and "Confirm" buttons.

As with manual cancellation, the measuring instrument is then purged with process gas and the normal operating state "Analysis" is executed again. This can be recognized by the status line.

If possible correct the error and repeat the process, otherwise contact Honeywell.



An operational calibration can also be triggered automatically ⇒ [8.4.1 Setting or changing automatic measurements](#) (p. 235)

### 7.4.3 Operating mode: Verification (special mode)

This operating mode can be used for device control. Manual -- similar to the operational calibration in the previous section -- or automatic execution are possible, see [↔ 8.4.1 Setting or changing automatic measurements](#) (p. 235).

A test gas of known composition is analysed for this purpose and the result is compared with the data of the manufacturer's analysis certificate of this gas.



As a rule, the process gas input for this operating mode must be connected to the test gas in the gas line (calibration gas input also possible). During this special mode, the last gas quality values of the analysis mode are output via measured value outputs. The analysis data of the gas must be stored exactly, a deviation will result in invalid values.

The comparison can be carried out on the actual displays. Use the superimposition keys to navigate to the Verification display and select **"Deltas"** in the topmost line. The differences between the measurement results and the data saved on the manufacturer's analysis certificate are visible in this display (only if a measurement has been completed, otherwise "?" will be displayed).

The data for the test gas can be viewed by selecting **"References"** on the Verification display. You will also see the HsV and Rho values calculated from the gas composition and the displayed standard.

If you are logged in and have the appropriate rights, you can also enter and edit the manufacturer's analysis certificate.

Q2 Deltas 11:38:30		Q2 References 11:24:53	
Operation:	Step:	Operation:	Step:
ISO 6976	Verification	ISO 6976	Analysis
HsV	0.00000 MJ/m <sup>3</sup>	HsV	39.83089 MJ/m <sup>3</sup>
Rho	0.00000 kg/m <sup>3</sup>	Rho	0.71748 kg/m <sup>3</sup>
CO2	0.0000 mol%	Name	CH4
CH4	0.0000 mol%	ID	217

Fig. 7-53: Q2 deltas and references displays

The calculated results can also be saved in an archive, for example "Test gas". This archive must first be created in enSuite. See section [↔ 8.3 Notices about parameterization](#) (p. 228).

Prerequisite(s)

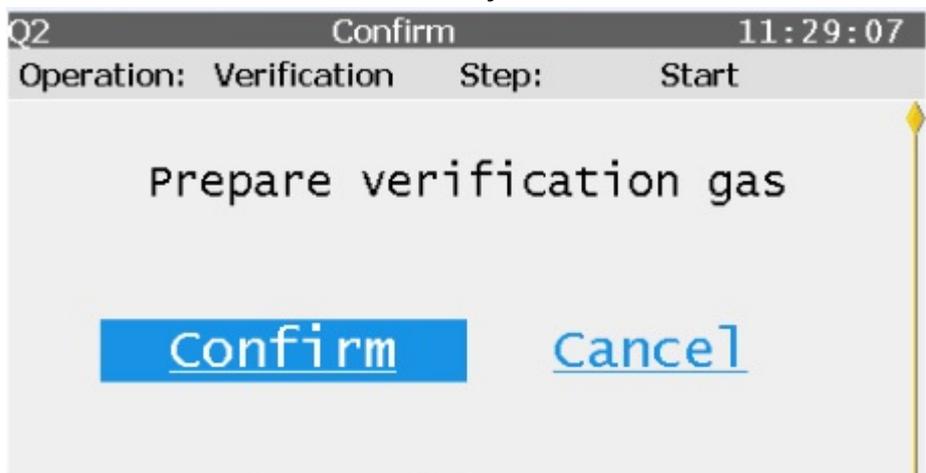
- The device is in normal analysis mode.
- You must be logged in and there are no sensor errors.
- The specified conditions for the security switch (SSW) are met.

## Steps

- 01 Activate on the device or in the remote operation panel [Verification](#)  
(Home-> Q2 Control)
- 02 Activate "**References**". Check whether the test gas mixture entered corresponds to the one used, if not, adjust it. ⇨ [7.2.6 Entries and changes using the operation panel](#) (p. 111)
- 03 Go back to [Verification](#) and activate "**Start**"



- 04 The analysis (current measurement) will no longer be updated or will be stopped. The device waits for a confirmation entry.



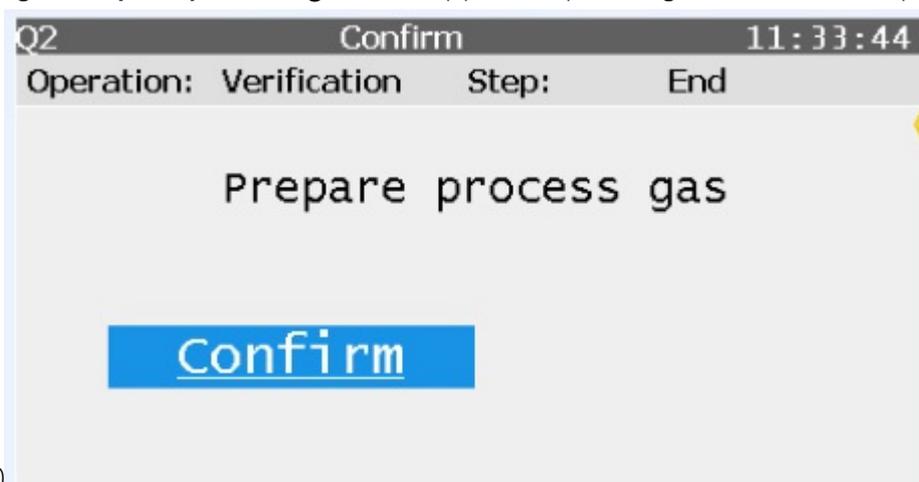
- 05 Change the gas at the parameterized input (process gas (PG) or calibration gas input (CAL)) ⇨ [8.4.1 Setting or changing automatic measurements](#) (p. 235) and connect the cylinder with the test gas to the inlet via a cylinder pressure reducer. Note ⇨ [2 Safety information \(EN-US-FRA\)](#) (p. 17) ⇨ [10.4.1 Connect/replace calibration-, verification- gas cylinders](#) (p. 273)
- 06 Open the test gas cylinder
- 07 Set the pressure between 0.15 MPag  $\pm$ 1.5 barg and 0.3 MPag  $\pm$ 3 barg.
- 08 After successfully connecting the gas, acknowledge the security query from step 4 with "**Confirm**" (or cancel the process with "**Cancel**"). After confirmation, the device will be flushed with the test gas and then the measurement will be started. See figure.

Q2	Verification	11:36:19
Operation: Verification	Step: Flushing	
ISO 6976	<b>Verification</b>	<u>Deltas</u> <u>References</u>
Hsv		? MJ/m <sup>3</sup>
Rho		? kg/m <sup>3</sup>
CO2		? mol%
<u>Stop</u>		

- 09 The measurement now runs for the time previously configured in enSuite. By selecting **"Stop"** you have the option of prematurely ending the test gas measurement. You then skip to the next step. Since the display is too long to show all the information at once, you can scroll using the cursor keys. The information from the last or current measurement appears on the display in the lower part below **"Start"** or **"Stop"** After the time has elapsed or if there is no test gas pressure, you will be prompted to return to the analysis mode. Select **"Start analysis"**.

Q2	Verification	12:17:49
Operation: Verification	Step: End	
ISO 6976	<b>Verification</b>	<u>Deltas</u> <u>References</u>
Hsv	39.83089	MJ/m <sup>3</sup>
Rho	0.71748	kg/m <sup>3</sup>
CO2	0.0000	mol%
<u>Start analysis</u>		

- 10 You will be requested to restore the original gas connection.  
(The message “**Prepare process gas**” will appear depending on the actual input used.



See figure)

- 11 Restore the original connection correctly. Obey all the safety information for working on gas connections. Conduct a tightness test. See section [↔ 10.3.3 Check the tightness of the installation](#) (p. 261).
- 12 Once the gas has been connected, acknowledge the security query from step 9 (see figure above) with **Confirm**. The device will revert to analysis mode, and the verification is ended.



If you log out during the task, you will no longer be able to access the verification function using the operation panel. The last confirmed step will still be performed. Log in again to continue.

## 8 Configuration and analysis software enSuite

The PC software concept based on **the configuration and analysis software enSuite** offers you the possibility to carry out configurations, parameterizations or device settings and diagnostics with the aid of a computer.

This PC software is also used for monitoring, control or archiving purposes and supports all Honeywell enCore devices. The combination of computer and device allows the control of the device from flexible distances.

**For devices without local enCore display enSuite is necessary to access the device**, if a local enCorer display is available enSuite can be used in parallel and complementary. If you cannot use the default parameter set, without deviation, enSuite will also support you. You should change parameters before or during commissioning. One example of these discrepancies is the use of gas properties not stored in the device for the verification or calibration.

With enSuite you get a comprehensive overview of the device and its operating situation. Your PC can thus also be used as a parametrization device.

The following sections are primarily aimed at measurement technicians. In addition to the **online help** ⇨ [enSuite online help](#) (p. 173), they explain the operation (e.g. starting / stopping measurements), parametrization, calibration as well as data and results management of the measuring device with enSuite.

**We assume here that the device is already properly installed mechanically and electrically as well as in terms of communication technology.**



**Always use the latest enSuite version for your work and get an overview with the help of the following information before accessing the device with enSuite.**

Honeywell offers courses and training to help you learn how to use the meters and take advantage of all the individual capabilities the instrument offers. If you are interested, please contact Honeywell ⇨ [12.1 Technical support Flow Computers and Gas analyzers](#) (p. 290)

## 8.1 enSuite basis of use

### 8.1.1 First steps to use enSuite

#### Install and uninstall enSuite

You can download the installation program from the Software Downloads section of the website:

[process.honeywell.com/us/en/site/elster-instromet/support#software-downloads](https://process.honeywell.com/us/en/site/elster-instromet/support#software-downloads)

This site also contains a file describing the installation procedure and the minimum system requirements. Complete the installation as specified on the website. Ensure that there are no special characters in the file path, otherwise it will not be possible to transfer files to a device.



If enSuite is already installed on your computer (parameterization device), make sure that you have the current version. If this is not the case, reinstall enSuite and make sure that no data is overwritten during reinstallation. (create a backup copy or change the storage location).



No restart is required after completing the installation.  
The shortcut symbol shown here will appear on your desktop.

If you no longer wish to use enSuite, uninstall it in the usual Windows way, but only if you no longer wish to access **any enCore device permanently**, as the uninstallation removes all enCore devices and data from your parameterization device (PC) at the same time.

You remove individual data in the **Navigation window** ⇨ [Starting enSuite](#) (p. 171) using **Delete** in context menu. After confirmation, the selected line and all subordinate entries are deleted.

## Starting enSuite

Start enSuite either via the enSuite program symbol  on the desktop or via the Start menu (Elster group of programs).

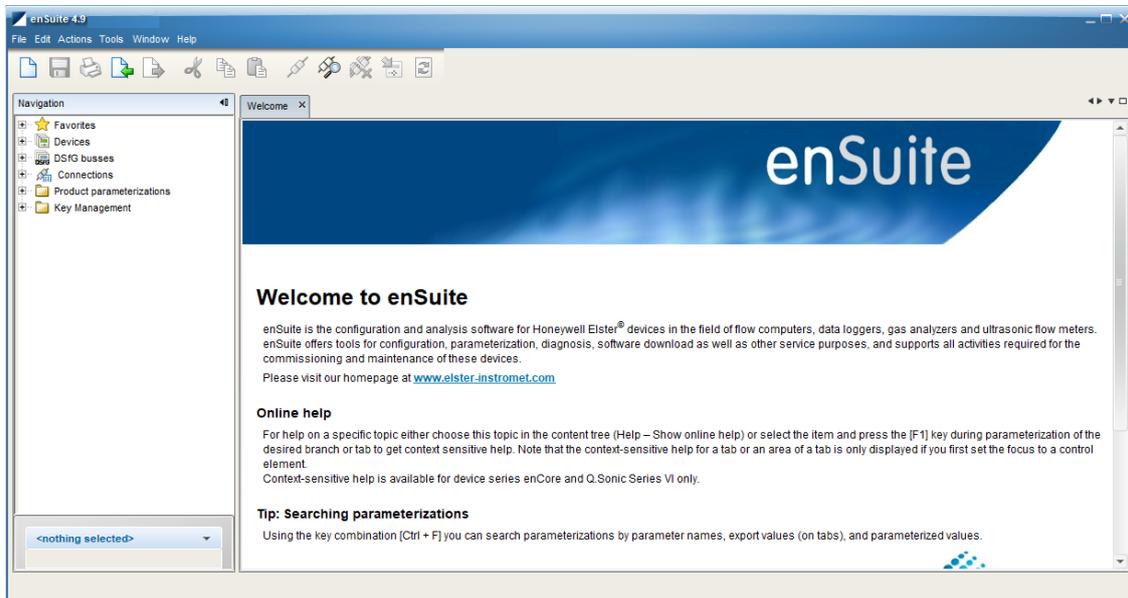


Fig. 8-1: Welcome window

The software's user interface will appear once it has been opened. At the top, there is the menu bar and below it is the button bar.

The language used by enSuite can be changed via the dialog shown in the following figure.

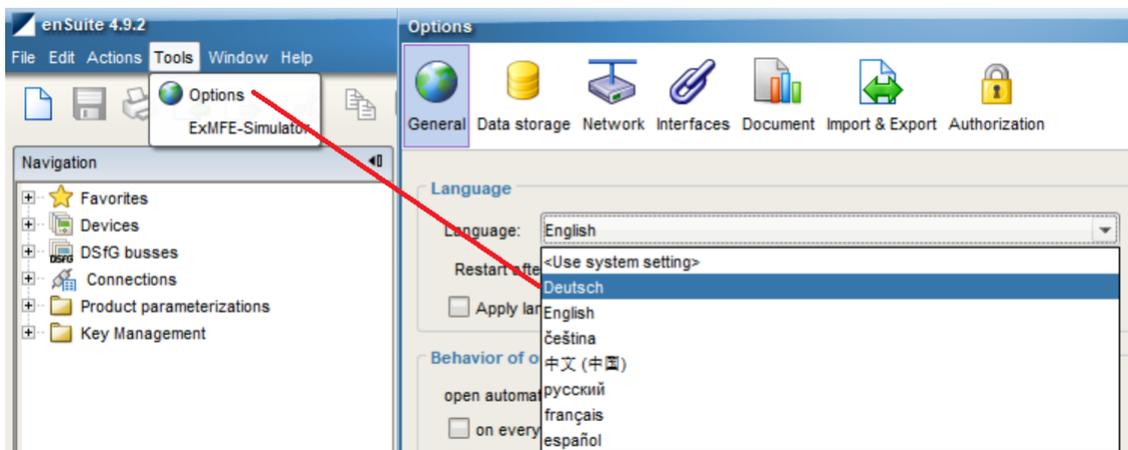


Fig. 8-2: Change language in enSuite

First open the dialog, then set the language you require using the drop-down menu. After confirmation your settings enSuite has to be restarted. A note and / or a link will be displayed the bottom right of the window.

The symbol  reminds of the pending restart.

The rest of the interface is split into window areas. The communication is established using these input and output windows.



More information about the interface is provided in the online help.  
⇒ [enSuite online help \(p. 173\)](#)

It is possible to detach some windows or window areas from enSuite and display them separately.

Open the context menu in the header or tab of the area you want to detach and select **"Float"** or **"Float Group"** or drag the item line to a free area of your desktop using **"Drag and Drop"**.

The individual windows can then be resized to a desired size. To do this, hold down the mouse button and drag the window edges or use the corresponding functions from the context menu.

Use **"Dock"** or **"Dock Group"** to reintegrate the window. Closing the window with **X** also removes the detachment.



 **"Reset windows"** (location **menu bar / Window**)

EnSuite remembers the position of the windows from previous applications. This function enables you to restore the default state and to eliminate erroneous display behavior.

## enSuite online help

Please use the online help to get an overview of the enSuite basic functions. You will find instructions on how to use the software and on basic settings as well as information on the parameters to be changed. The manual supplements the information if necessary.



You can activate the general online help via the menu item Help –  Show online help. Open the context-sensitive help (help on a specific topic) directly from the desired branch in the parameterization window with [F1]. A help text for the selected / current position appears.

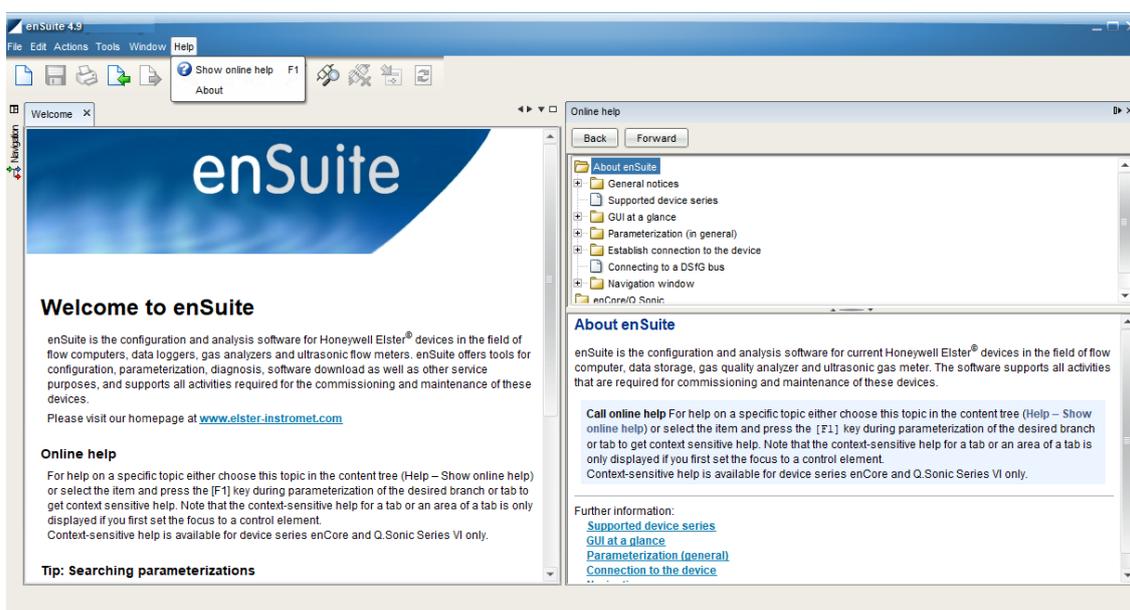


Fig. 8-3: enSuite online help window



### Tip

For a first overview, go through the shown folder path of the general help starting at **About enSuite** up to **Navigation window**. Then go to **Supported device series** and branch to your device type for more details.

## 8.1.2 Data connection to the measuring device

### Connection options

A data connection between computer and device can be established either directly via a USB cable or via TCP/IP computer network.

The communication between enCore device and enSuite is carried out via MMS and is secured via TLS since Basic System 03-39. The enCore device uses a self-signed certificate to authenticate itself to enSuite every time an MMS connection is established. The certificate is normally created once when the enCore device is put into operation and is announced to enSuite during the first MMS connection.

### Notes for GQ-enCore devices

**For installed devices, mainly use the TCP/IP data connection, since a device opening, unlike the USB connection, is not required and the PC can be located outside the hazardous area.**

**Usually you cannot use the USB connection with installed GQ devices, since a device opening is required. For devices without a display, the network settings can be found and changed via this connection. Be sure to observe all safety regulations when use the USB connection with open housing.**

### Connect the enCore device via TCP/IP

#### Prerequisites

- Device is mounted in an accessible computer network.
- cable type according to Category 5 (Cat 5)

Connect the service PC and enCore device with a CAT 5 cable (e.g. via a network). The network interface is located in the device. ⇨ [5.6.5 Electrical connection diagram and electrical interfaces \(inputs and outputs\)](#) (p. 81)

### Connect enCore device locally via USB

#### Prerequisite

- USB cable type A to B (not included in delivery)

Connect the service PC and enCore device with the USB cable. The USB interface is located in the device on its boards. In the Q2 the USB port is near to the SSW refer to ⇨ [Use of hardware parameter protection \(SSW\)](#) (p. 95)



Since Windows 10, enSuite can communicate with the enCore device via USB without driver installation, use always current Software versions.

You may need to change the Windows USB energy saving settings for USB connections between notebooks and enCore devices if problems occur when connected, since in particular mobile devices are designed to use as little energy as possible.

### Possible USB connection problems

**Prerequisite** You use a Windows notebook to establish a USB connection between enSuite and enCore device.

**Problem** As soon as the notebook wakes up from sleep mode, it may happen that Windows no longer recognizes the USB device correctly and cannot restore the USB connection between enSuite and enCore device.

**Workaround** As soon as you unplug the USB connection cable from the notebook and plug it in again, the USB hardware recognition under Windows starts. As soon as Windows recognizes the USB device, you can establish a connection between enSuite and the enCore device again. It is not necessary to restart the notebook.

**Prerequisite** You use computers before Windows 8 and computers with an old enSuite installation

**Problem** Connection via USB is not possible.

**Workaround** Delete the old driver and install a current version (you will require administrator rights on your parameterization device). Open the Device Manager (the physical connection still exists between the devices). Uninstall the Elster enCore device. Look on the enSuite CD or in your Downloads folder for "**drivers\Zadig**" and start the application. **Install the WCID driver.**

### Connect enCore device to Service PC

Select one of the following options in enSuite:

Symbol	Action	Description
	Search device (alternatively press the [F3] key)	Searches for all accessible devices and establishes the connection. All devices which were unknown up until now are entered in the enSuite database.  This option is recommended for all initial connections established with one or more devices.
	Connect	Establishes the connection to a specific device. The device must be contained already in the enSuite database and selected in the navigation window under the Devices branch (identification via serial number).

In both cases, a dialog to select the connection path appears once the option is activated.

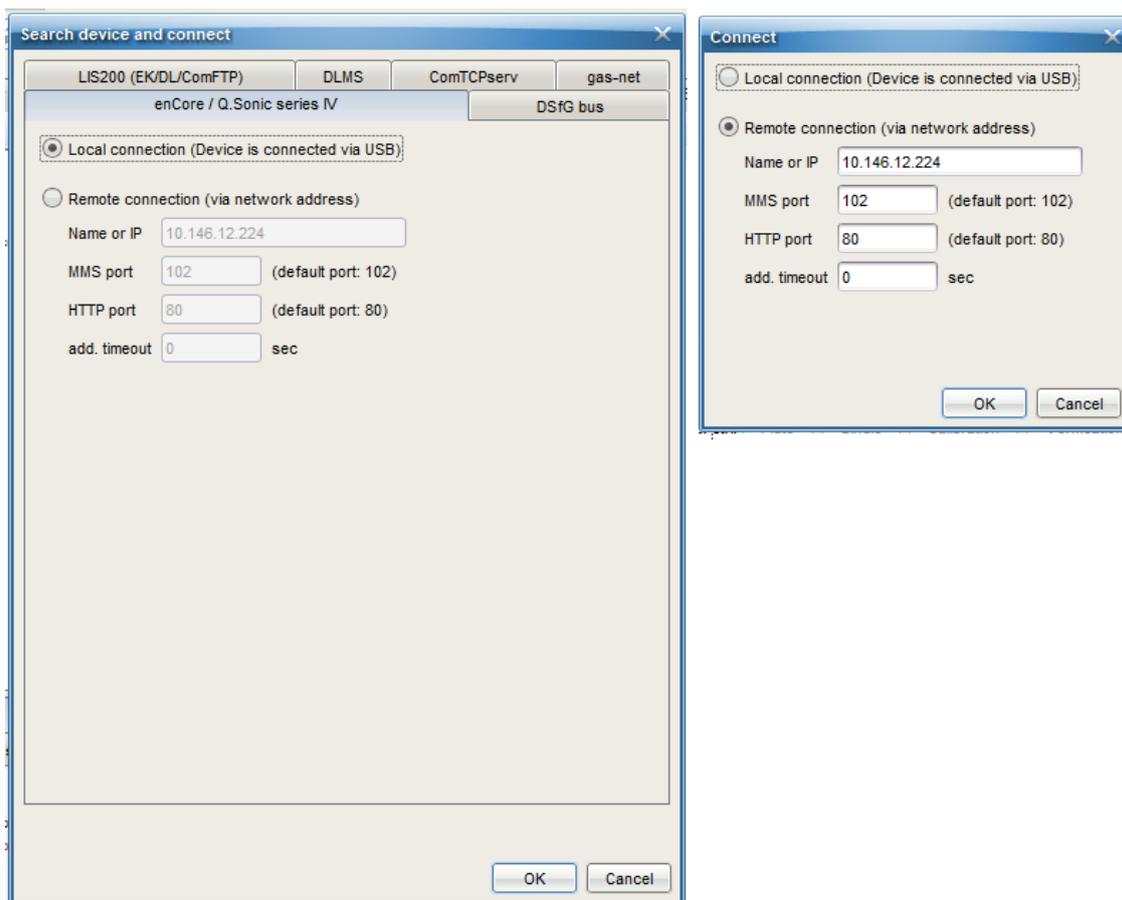


Fig. 8-4: Dialogs to select the connection – example

- To establish a USB connection, select **Local connection**; to establish a TCP-IP connection, select **Remote connection** – in this case, the network name or IP address of the enCore device is required, adjust the default ports if necessary.
- Confirm with **[OK]**.

Only in case the certificate is unknown to enSuite, it will be displayed for validation. This is the case the first time the device is connected, or the device authenticates itself with a new certificate.

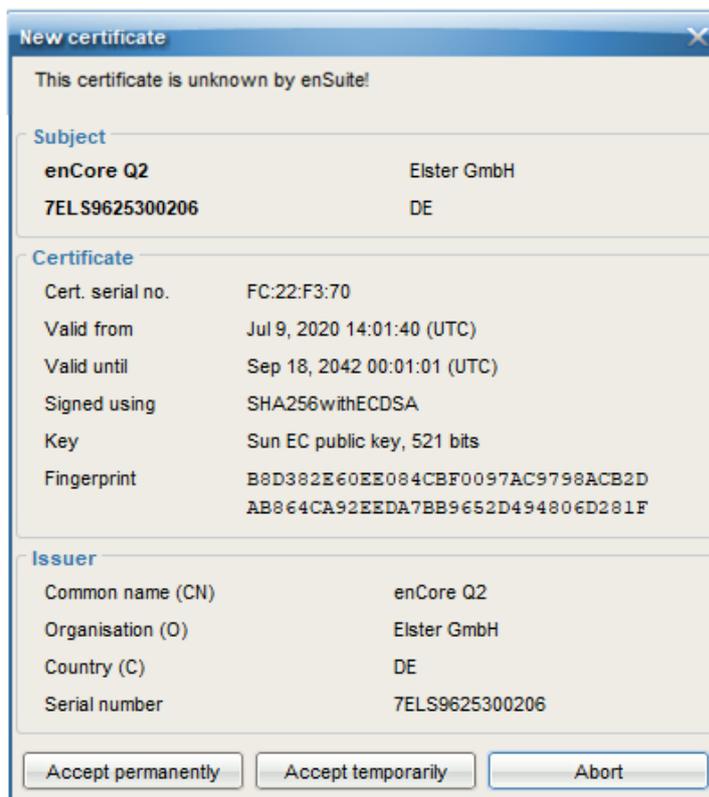


Fig. 8-5: Certificate is still unknown – example first connection establishment

Check the validity of the certificate. You have the following options:

- Check certificate on site directly on the device:
- Info – <device serial no.>, Certificate
- Open the certificate information via the basic display  of the device:
  -  Info – <device serial no.>, Certificate
- Compare fingerprint and subject information from enSuite and device.
- Check certificate remotely:

Without a connection to the device, you have no way to compare the fingerprint. Therefore, check the information about the device in the section **Subject** of the dialog first. If the information is correct, the next step is to establish a **temporary connection** to the device. (⇒next action)

You now have the following options:

- If you trust the certificate (for example, because the fingerprint matches), select **[Accept permanently]**. In this case, enSuite saves the certificate. Each time a connection is established, enSuite compares the received certificate (in the background) with the saved one. As long as both certificates match, enSuite trusts this connection and establishes the connection. Only if the device's certificate changes, e.g. because a user has newly created the certificate, will enSuite display the new certificate information.

- If you are unsure whether you trust the connection (e.g. because you are not on-site), select **[Accept temporarily]**. The current MMS connection will remain, but enSuite will not save the certificate. The next time a connection is established, a security query will appear again.
- If you do not trust the certificate, select **[Cancel]**. In this case, the MMS connection is interrupted.

As soon as the connection is established, you can readout and parameterize the device etc.



#### Compare the fingerprint of the certificate remotely

Since a temporary connection exists, call the **Remote operation panel** ⇨ [8.6 The Remote operation panel actions](#) (p. 243) and open the certificate information via the basic display  of the device:

**i** **Info – <device serial no.>, Certificate** ⇨ [Info display \(Serial number and TLS certificate\)](#) (p. 116)

In enSuite, open the output window via **Window – Output**. Here all transferred certificates are linked with the time stamp of the transfer. Open the corresponding certificate with **Show certificate** and compare fingerprint and subject information of enSuite and (device) display with each other.

If both match, you can permanently save the certificate in enSuite by re-connecting to the device and **[Permanently accept]** the certificate.>

In the enSuite **navigation window**, all devices with serial numbers which are contained in the database are listed under the **Devices** branch.



#### Device ID

The individual devices are identified in the enSuite database via their serial numbers. In addition, it is possible to append an individual name to the serial number (highlight device, select **Properties** in the context menu and enter the name).

With respect to devices for which a connection has currently been requested but has not yet been established, the device symbol is marked under the **Devices** branch with a yellow dot .

The device symbol is then marked with a green dot  during the data connection.

In addition, all devices for which a connection has been established during the current enSuite session are listed under the **Connections** branch. These entries are retained until enSuite is closed, even if the respective connection is disconnected.

## Disconnecting the device

There are two further options available to disconnect data connections:

Symbol	Action	Description
	Disconnect from all devices (alternatively press the [F4] key)	Terminates all active connections.
	Disconnect	Terminates the connection to the device which is selected in the navigation window (identification via serial number).

## 8.1.3 Saving and managing the device setting

The following section explains how to read out and save and export the device parameterization, the software structure of the device and the import of saved parameterizations.

### Read-out parameterization



#### NOTICE Data and function loss possible!

There is no automatic backup of the parameterization in enSuite!

Avoid data and function loss by reading out the parameterization after each change. Create a backup for emergencies by saving each parameterization read out and exporting it if necessary.

There must be an active data connection to the device ⇔ [Connect enCore device to Service PC](#) (p. 175) before the parametrization can be read-out from the device. If a connection exists, proceed as follows:

- 01 Highlight the device in question in the navigation window either under the Devices branch or under the Connections branch.
- 02 Select the action **Read out parameterization** in the lower section of the navigation window or open the context menu and select **"Readout parameterization"**. A dialog **"Save as"** will appear.

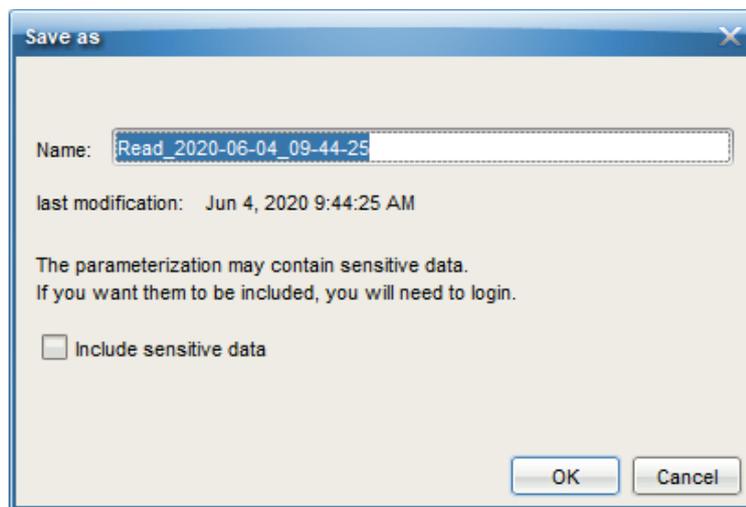


Fig. 8-6: Save as dialog

- 03 If necessary, you can now change the displayed name by overwriting it. Then press **[OK]**.



For GQ devices it is not necessary to mark the check box because no sensitive data is transferred. If the check box is selected a login dialog will appear after pressing **[OK]** button.

## Software modules of the parameterization

GasLab Q2 is based on a Honeywell product platform called **enCore**. Both the hardware and software have a modular design. The device software of each enCore product consists of the following:

- The Basic System is responsible for functionalities (such as the I/O coupling or connection to digital protocol interfaces) and is a key component of the software for all enCore devices. The Basic System that contains its functionalities in blocks called **SFBs (System Function Blocks)**.

and

- **Application Function Blocks (AFBs)** An AFB is a single application-specific functionality that can be added or removed via the parameterization. The AFB arrangement is variable; most AFBs can also be used several times. Which AFBs are necessary for a device or which AFBs can be used as an option depends on the individual device type.

The illustration shows this principle



Fig. 8-7: enSuite blocks(basic system with SFBs and AFBs)

One AFB for the device-specific properties which is always included bears the name of the device, in other words Q2.

### Viewing the parameterization of SFBs and AFBs

To establish which SFBs, AFBs and settings the device uses or with which ones it was delivered, read out the unchanged parameter set ⇒ [Read-out parameterization](#) (p. 180)

This is stored in **devices - <serial number/name> - parameterizations** branch of the **navigation window**, see the following example

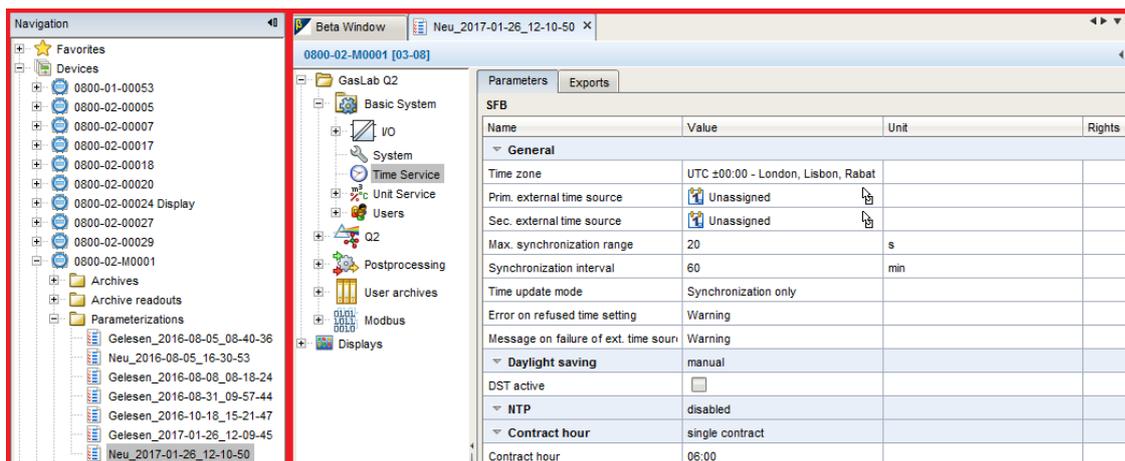


Fig. 8-8: Navigation window and parametrization window examples.

After double-clicking on the file, enSuite opens the **parameterization window** (left part in the example) and displays the parameterization. The tree structure is displayed next to the navigation window. The top level shows the device name; in the subordinate level you can see the Basic System and the AFBs. The individual parameters are displayed on the right side of the window after selecting an element in the tree. The **online help** provides further information about this window.



Several parameterization windows may also be opened in different tabs. You can distinguish them by way of the tab label – the parameterization name is stated here (saved name or identification of the device for new parameterizations and parameterizations which have not yet been saved).

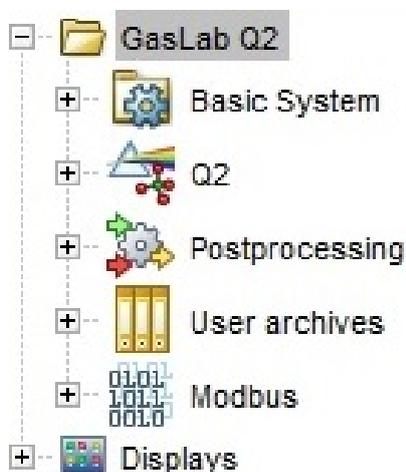


Fig. 8-9: Example of a device tree structure



The default parameterization is visible in the parameterization window when it is read out for the first time. The meaning of the individual software parts and parameters is explained in detail in the **online help**.

## AFB configuration

You can see the current parameter structure tree on the left-hand part of the parameterization window. The root is for the device. The first sublevel consists of AFBs that are currently included. The Basic System is always included in the device software; however, AFBs may be grouped, added or deleted.

If the tree root (i.e. the device name) is highlighted, you will see all available AFBs for the device in the Configuration tab. Of each AFB, both the version and the number of instances already used in the parameterization are stated there.

Generally speaking, the AFB composition can be freely configured. Restrictions result from the resources already in use. Most AFBs can be used several times.

Here's how to edit the AFB composition:

**To add an AFB**, highlight it in the right-hand part of the window in the Configuration tab and click on Add AFB. Check the font color of the newly added AFB in the parameter window:

- font color orange The AFB does not conform to the approval. Click [Make compliant] again.
- font color blue The changes are compliant, but not yet saved.

**To delete an AFB**, highlight the AFB in the parameter tree and click in the context menu Delete AFB.

- If an AFB is deleted, it may happen that the parameterization is no longer valid. In this case, all parameter folders and parameters that contain invalid references to the deleted AFB are marked in red.

## Saving, and exporting the parameter set

Enter a name for the file in the "Save as" dialog. The read parameterization is then stored under this name under the **Devices – <Serial Number/Name> – Parameterizations** branch. Change the suggested name, for example to "Default\_parameters\_YYYY-MM-DD" (always include the date so that you can identify the backup copy).

Check that the parameter set has been saved correctly in the **Navigation window**. A file must now exist with the selected name. See the following example:

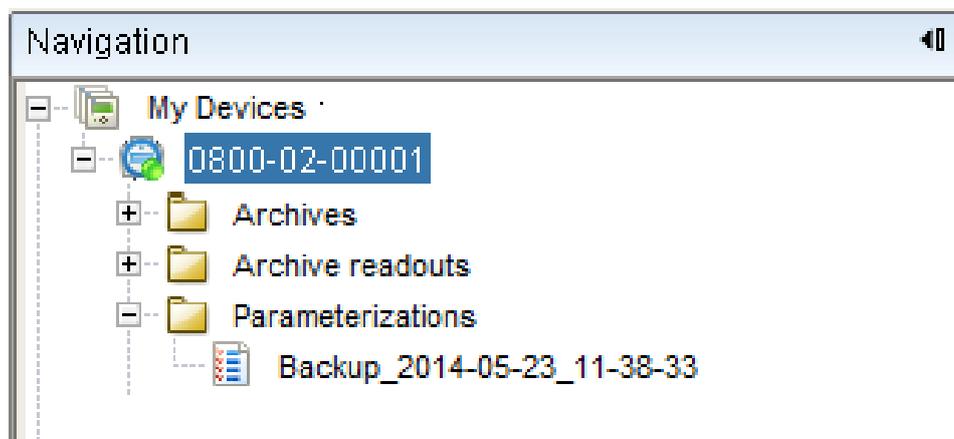


Fig. 8-10: Example of saved parameter set

After double-clicking on the file (Backup in the example), enSuite will open the parameterization window and show the parameter set. See the online help for more information about this window.

Certain parameters are set to defined values as default. You have now backed up these values. Do not make any more changes to this file which can be used as a restore and backup file in an emergency.

To become independent from your current enSuite installation, you can also export selected files using the icon in the enSuite window or the export function in the context menu. As in the example, click on the highlighted icon and follow the dialog boxes. Once the file(s) have been exported, they should be saved under a defined name as a backup copy on the PC hard disk or externally.

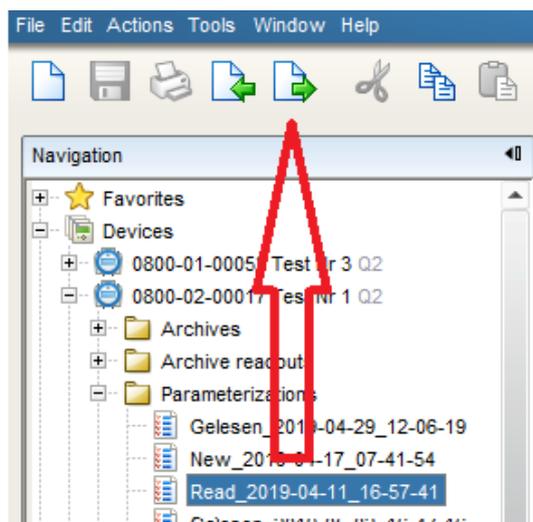


Fig. 8-11: Example of saved parameterization



**NOTICE Data loss is possible!**

Changes to parameterization already saved in enSuite are saved under the old name, i.e. the original file is overwritten!

**For changes, always read out the current parameters from the device, do not change any parameterizations saved for documentation or as a backup.**

## Import parameter settings (Reset device)

### Import selected files (backup's)

As usual under windows you drag your file (backup) and drop it in the upper part of the navigation window. You can also click on the icon above the red arrow (see next figure) and follow the dialog boxes. Once the file has been imported, it will appear in the navigation window under the parameter tree of the device, as in the example.

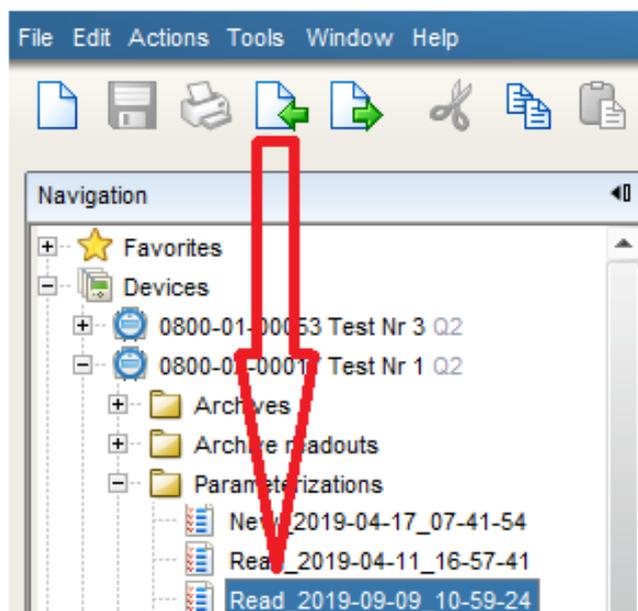


Fig. 8-12: Example data import



Note that imported data may no longer be up-to-date. For example calibration gas properties have to be adjusted or the version must be updated.

### Reset device

If the device no longer produces acceptable results due to several incorrect settings, it may be necessary to restore an older parameter set or the factory settings. Requirements are

- All required data has been read out from the device and saved on an independent system (PC / parameterization device).
- A backup or an older parameterization is available on the PC or parameterization device.
- No software update has been performed since the data was created or the versions are still compatible.



This process should only be used when all other options have been exhausted, as the current settings in the device will be deleted. If you are in any doubt, contact Honeywell.

### Steps to restore the device to its previous state

- **Connect to the device** ⇒ [8.1.2 Data connection to the measuring device](#) (p. 174)
- **Select the desired file** (delivery parameterization / backup), if it is not in your enSuite installation, you have to import it first, see above.
- **Transfer the "the backup" into device.** Use action **Transfer parameterization to device**

After transferring the data, the device restarts and works again with the settings from the backup file.

## 8.1.4 Update Downgrade and Bugfix-Software

As with all products, changes and additions to the GasLab Q2 take place from time to time.

Make sure that you keep the device up to date and use the appropriate version of the documentation. This increases data security and leads to better measurement results.

You should therefore check from time to time whether the software (terms firmware and software are used synonymously) used is still up to date.



Only use the latest software that has been released in accordance with the approvals of your instrument. The exchange of software may be restricted by special access rights ⇒ [8.2.5 User and rights management](#) (p. 201) and is only possible with open security switch ⇒ [6.1.4 The hardware parameter guard \(SSW\)](#) (p. 95).

Observe the notes on the web page <https://process.honeywell.com/us/en/site/elster-instromet/support> and its sub directory's like **enSuite**, **enCor** and **Gas analyzers** .

According to this pages, including update instructions, check whether the installed version meets the necessary requirements.

If the software is out of date, update all software parts. You will find all needed information, if in doubt, contact Honeywell or have Honeywell update the device.

Also have a look to following general information.

## Check update

You ensure that the desired software modules have been transferred to the device by comparing the version numbers in enSuite (**Configure software** window) with the version numbers of the device.

01 Switch from the home display to the display **i Info – Software status – <Basic System or name of legally relevant AFBs>**.

Here (among other things) the Basic System and the used AFBs are listed with their version number.

Component	Version	Hash
proChain	03-42-A	68D79E3F
NonFiscal	Elster	FC9A4593
1 GCBASE1	1.1.0	30835D7A
2 GCBASE2	1.1.0	30835D7A
5 GCM_22b	2.5.4	BA0BE3C2
6 GCM_22b	2.5.4	BA0BE3C2
Basic System	03-42-A	D8C114E4

Fig. 8-13: Basic System and AFBs with version number – example

### Possible red text during software configuration (error)

**Situation:**The function software configuration shows red entries in the software window

**Cause:**Depending on the scope of the updates, the enSuite settings have to be changed to allow all possible steps and to get only green entries.

**Action:** Change the enSuite settings, open tabs as shown

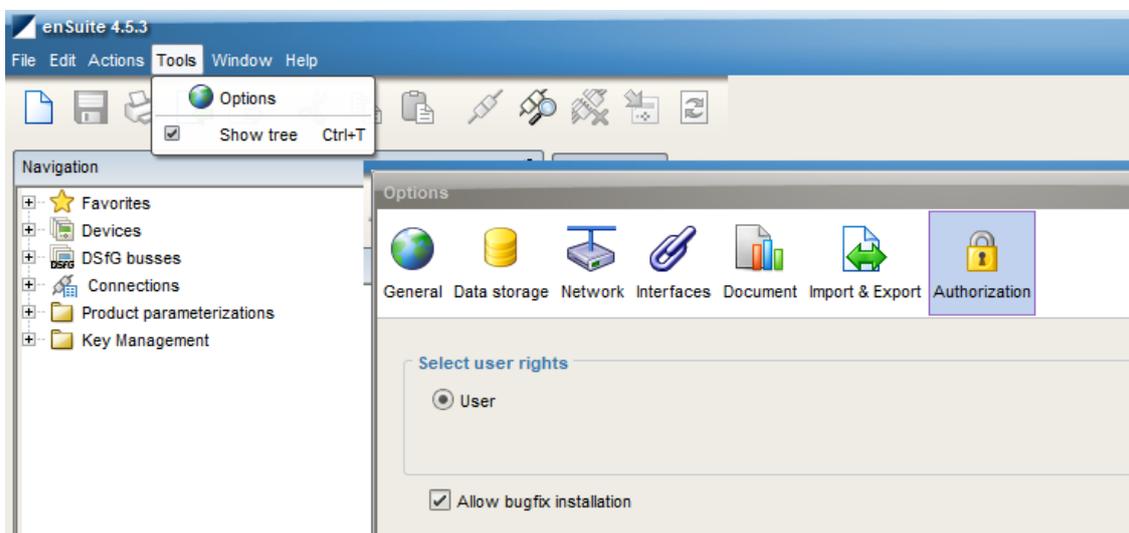


Fig. 8-14: Change of settings

Select tap "**Options**" select option "**Authorization**" set check box as shown.

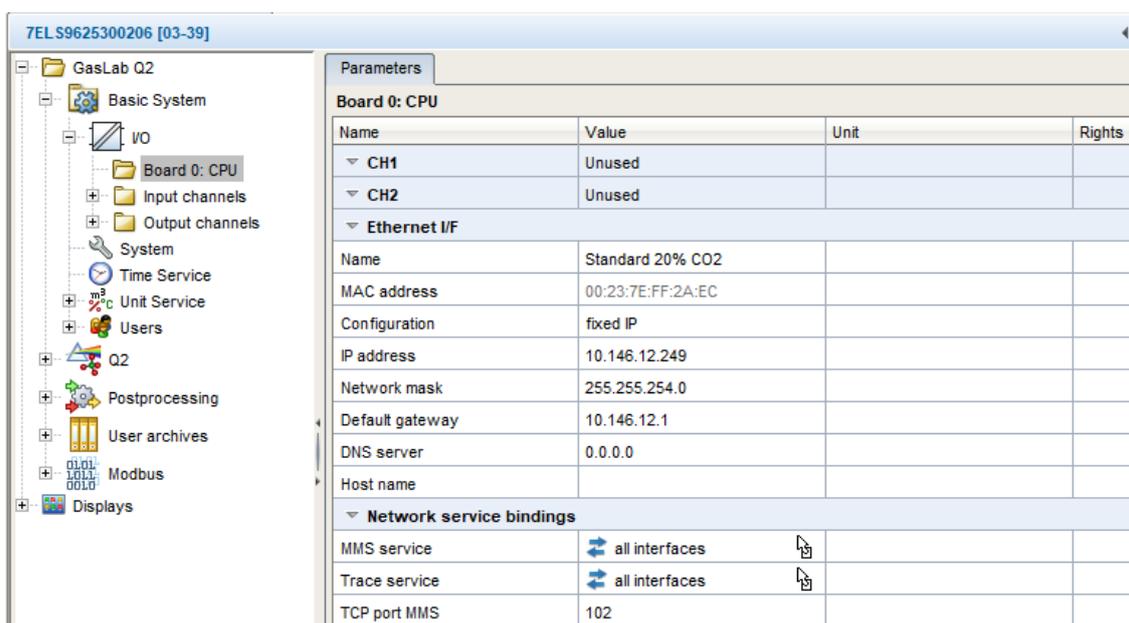
**Result:**After reopening and repeat of the steps only green entries are shown

## 8.2 Changing basic (system) settings

The following section explains some SFB of the basic system and how to adjust their settings. An overview is given in the online help. Select **Basic system** in the parameter tree of the **parameterization window** and press **[F1]**.

### 8.2.1 SFB I/O (IP address network- and I/O-settings)

The IP address and the input and output channels are part of the parameter set existing in the device. After reading out the parameterization ⇔ [Read-out parameterization](#) (p. 180), you can change the settings (offline) on the following page:



Name	Value	Unit	Rights
CH1	Unused		
CH2	Unused		
<b>Ethernet I/F</b>			
Name	Standard 20% CO2		
MAC address	00:23:7E:FF:2A:EC		
Configuration	fixed IP		
IP address	10.146.12.249		
Network mask	255.255.254.0		
Default gateway	10.146.12.1		
DNS server	0.0.0.0		
Host name			
<b>Network service bindings</b>			
MMS service	↔ all interfaces		
Trace service	↔ all interfaces		
TCP port MMS	102		

Fig. 8-15: I/O Settings in enSuite



#### NOTICE

**Do not change the network settings without consulting the IT administration**

Note all changes and show them on the device or its documents!

Change or activate the following I/O interfaces (the parameters open after clicking the folder) for communication and data exchange with other devices.



Refer to the information in the online help which contains more details required to define all the parameters for the following settings.

## Ethernet settings

For data communication, connections via Ethernet are mainly used. Go to parameter branch: **GasLab Q2 – Basic system – I/O – Board 0 : CPU**. Fill in your changes, proceed like explained in the online help. Also note the information in section ⇨ [Ethernet connection](#) (p. 84)

## Serial interface RS485

These connections include, for example, other measuring instruments, devices for final processing and evaluation, PLC systems, etc.

Go to parameter branch: **GasLab Q2 – Basic system – I/O – Board 0: CPU**. On the **Parameters** tab: Set the type of CH1 (terminals TB4-1 to TB4\_3) or CH2 (terminals TB4-4 to TB4-6) from **Unused** to **Protocol channel**.

Refer to the information in the online help which contains the details required to define the other parameters. Also note the information in section ⇨ [RS485 serial interface connection](#) (p. 86)

## Digital inputs

There are two electrically isolated inputs supplied by the device. Go to parameter branch: **GasLab Q2 - Basic system – I/O – Input channels** and set the type from **Unused** to **Message input** or **LF pulse input**. Also note the information in section ⇨ [Digital inputs](#) (p. 87)

## Digital outputs

There are four outputs outputs (electrically isolated passive output circuits). Go to parameter branch: **GasLab Q2 - Basic system – I/O – Output channels** and set the type from **Unused** to the desired function offered in the pop-up menu e.g. **Message output** or **Pulse output**. Also note the information in section ⇨ [Digital outputs](#) (p. 88)

## Analog outputs

Four common galvanically isolated active output circuits ("common ground" / short-circuit proof) with 0 or 4 to 20 mA are available. Go to the parameter branch: **GasLab Q2 – basic system I/O - output channels** and set in the register card the type of current output for the relevant channel (in the range I1+ I-, I2+ I-, I3+ I- or I4+ I-). For the Current Range parameter, set the desired current output range: - 0 to 20 mA or 4 to 20 mA. Also note the information in section ⇨ [Analog outputs](#) (p. 89)

### Possible error: Current output does not react.

**Situation:** After a parameterization, the outputs of the current outputs do not show the expected values.

**Cause:** The output condition has been set to "Used" but in the following line no Output condition is selected (See figure line with flag "Unassigned").

Parameters		Exports	
I1+ I- Current output			
Name	Value	Unit	Rights
▼ General			
Name			
Physical quantity	Absolute pressure		🔒
Physical unit	bar *		🔒
Output assignment	📊 Q2.Sensor values.PI		🔒
Filter mode	Not filtered		
Current range	4 to 20 mA		🔒
Physical value at 0/4 mA	0.9	bar *	🔒
Physical value at 20 mA	4.5	bar *	🔒
Current value on error	0.0	mA *	🔒
▼ Output condition			
Output condition	🚩 Unassigned		
Inverted	<input type="checkbox"/>		
▼ Adjustment			
Adjustment	Unused		

Fig. 8-16: Output condition "Used" / "Unassigned"

**Action:** Set the output condition completely or set the first line to:

▼ Output condition	Unused		
--------------------	--------	--	--

Fig. 8-17: Output condition "Unused"

## 8.2.2 System settings

In node System you can parameterize basic system settings. The following Function Blocks are summarized here for enCore devices:

- ⇒ General system settings
- ⇒ Error List
- ⇒ Audit trail
- ⇒ Checksums

Parameters and export values are documented in detail in the online help. Select **System** in the expanded parameter tree of the **parameterization window** and press **[F1]**.

### Checking integrity using the checksums

The enCore device monitors the integrity of its software during operation by recalculating the checksums for the various software modules and parts of the device parameterization in cycles and verifying these checksums against the setpoints. To ensure that the calculations and system functions are executed “just in time”, it also monitors the system load and computing times.

### Parameterizing general settings in enSuite

To parameterize some general monitoring settings and define what happens in the event of an error open the System branch of the parameterization. The parameters for the integrity check are grouped in the **Parameters tab** in the **General section**. The online help provides further information about the parameters and possible settings.

### Defining acceptance procedure of the error list

In general, alarms and warnings remain in the fault list until they have gone and are considered acknowledged. The acceptance procedure of the **error list** is determined by two parameters:

- **Inactive errors can be accepted only** In this case, you can only accept errors when they are no longer pending. Once they have been accepted, the errors will be deleted from the list
- **Errors can always be accepted** In this case, you can accept all errors, regardless of whether they are currently pending or not. In this case, too, all inactive errors will be deleted from the list. If errors are active when they are accepted, they will remain in the error list and will then be deleted from the list automatically when they end.

You parametrize the acceptance procedure in enSuite under  **Basic system** -  **System** on the **Parameter tab**.

By default, it is possible to accept errors without logging in. Alternatively, you can only allow accepting for selected user profiles. In this case, you can additionally place the action under the protection of the security switch.

Path: [<Device>](#) - [<Basic system>](#) - [<Users>](#) -  [<Special user rights tabs>](#)



Fig. 8-18: Accept errors (Special user rights)

## 8.2.3 Time service SFB settings and system time action

Time Service is a System Function Block (SFB) of the Basic System. The following areas can be parameterized with the Time Service:

- General
- Daylight saving
- NTP
- Contract hour

Parameters and export values are documented in detail in the online help. Select **Time Service** in the expanded parameter tree of the **parameterization window** and press **[F1]**.

### Time-related values and actions

Check or set the following settings:

**Time zone** local time zone of the device (relative to UTC)

**Prim. external time source** **Sec. external time source**

The device time can be changed directly on the device, via enSuite or via external time sources.

**Max. Synchronization window** maximum changeable difference of the system time

**Synchronization interval** Synchronization only possible within this time interval

**Time update mode** Synchronize system time only or also set

**Error on refused time setting** Behavior if takeover of external time rejected.

**Message on failure or ext. time source(s)**

Behavior if all parameterized external time sources are disturbed:

**Daylight saving** changeover from normal time ( $\triangleq$  "winter time") to daylight saving time and vice versa.

**NTP** the enCore device can synchronize its system time via Network Time Protocol (short: NTP) against highly accurate time servers.

**Contract hour** Contractual times and duration of the gas day

**Parameters and export values are documented in detail in the online help, press [F1].**

In the export value window SFB provides time related events under **Basic system time service** time events. They can be used as input signal for time-controlled actions in other SFBs or AFBs. )



Special case: Trigger for a longer cycle duration is activated first

Event signals in a second rhythm are formed relative to a full minute and event signals in a minute rhythm are formed relative to a full hour. For example:

⚡ Every other minute e.g., 12:02:00 ... 12:04:00 ... 12:06:00 ..., etc.

⚡ Every 3 minutes e.g., 12:03:00 ... 12:06:00 ... 12:09:00 ..., etc.

This means that immediately after the device is restarted and until a cyclic event signal is first triggered the time depends on the boot time and may be shorter than the associated cycle. This special case can only occur once immediately after the device is restarted.

Example: If the enCore device is switched on at 12:02:30 and the signals ⚡ Every other minute and ⚡ Every 3 minutes are used as triggers, at system time 12:03.00, the signal ⚡ Every 3 minutes is formed and only subsequently at 12:04.00 is the signal ⚡ Every other minute formed.

### Update date and time (system time action)

The system time is the combination of the device time and date. You can update it with the enSuite action "**Update date and time**" or on the operation panel → [7.3.5 System display Time Service \(System time and date\)](#) (p. 126)



The online help provides the necessary information. In the help window under **About enSuite >> Navigation >> Devices >> Device - actions >> Update date and time.**

## 8.2.4 Settings Unit service SFB and displays

In each device parameterization there are parameters describing physical quantities. The **Unit Service** is a System Function Block (SFB) of the basic system for managing these quantities. The predefined units are based on the International System of Units SI (Le Système International d'Unités) and the conventions and rules of the US National Institute of Standards and Technology (NIST). You can make the following adjustments in the Units Service:

- Change standard units
- Define new units
- Adapt display formats of physical quantities

Select **Unit Service** in the expanded parameter tree of the **parameterization window** and press **[F1]**.

The node **Displays** contains all displays of an enCore device. Depending on the authorization, you can create displays and adapt them to your requirements. The online help provides the necessary information. Select **Displays** in the parameter tree of the **parameterization window** and press **[F1]**.

### Change default units

For each parameterization, one unit is predefined in enSuite as the default or standard unit for each physical quantity. Characteristics of standard units are:

- The default units are identified in enSuite with an asterisk (\*). In selection lists there is a second entry for this unit as **"normal"** unit without asterisk.
- The associated default unit is used as a pre-assigned value if you, for example, allocate a physical quantity to an input or output channel first. Alternatively, you can select another unit from the set of units for a physical quantity in a targeted manner for parameters or export values. You can change units of parameters on the Parameter tabs and units of export values on the Export value tabs.
- If you change a standard unit, the new standard unit is automatically updated in the entire parameterization for all values that use this standard unit. Measured values are automatically calculated in the new unit.  
**Attention. Limit or fixed values are not recalculated and must be adjusted manually.**
- It is possible to use any unit, e.g. for individual parameters or export values, as a **"normal"** unit and thus exclude that this unit would be automatically adjusted due to a changed standard unit.

Which unit is used as standard unit for a physical quantity is parameterizable:

## Changing default units in enSuite

- Open the branch  Basic System -  Unit Service.
- The tab Parameter lists all physical quantities in the area Default units which are typically used by enCore devices. The column Value displays the default unit currently allocated to each physical quantity.
- To allocate a default unit to a physical quantity, mark the corresponding row.
- The drop-down menu in the Value column contains all pre-defined and user-defined units for this physical quantity.
- Select the desired unit. As soon as you save your change, the unit selected is set as the default unit across the entire parameterization for this physical quantity. Parameters which use this default unit automatically use this new default unit. There are two entries for this unit in the drop-down menus: there is one entry as the default unit <Unit> \* and one as a "normal" unit <Unit>.

### Example:

The default unit for the physical quantity temperature is degrees Celsius (°C). To allocate the unit Fahrenheit as the default for temperature (°F)

- mark the temperature row. In the Value column, in the drop-down menu select the entry °F.
- As soon as you save the change, Fahrenheit (°F) is the default unit for temperature values.

## Define new units

If you need an additional unit not provided as a standard for a physical quantity, you can easily define this based on a pre-defined unit. A user-defined unit is useful for example if you...

- ... need various display formats or unit symbols for a unit. In this case, the value itself is not converted, just displayed in a different way.
- ... want to use a unit based on a decadic factor – a single, ten, hundred times the value etc. – for counter values and for example want to derive the unit centimeters from the unit millimeters.

A user-defined unit is defined from a pre-defined unit by indicating a gradient and an optional offset. To do this, the gradient and offset for the linear conversion of a value in the pre-defined unit to the value in the user-defined unit must be determined. The formula is as follows:

$$\text{Value in user-defined unit} = \text{Gradient} \times \text{Value in predefined unit} + \text{Offset}$$



You can only derive user-defined unit from a "normal" predefined unit (<unit>), but not from the standard unit with\*.(A standard unit is also always present as a "normal" unit).

## Create a new unit in enSuite

- Open the Basic System - Units Service - User-defined units branch.
- On the **Parameter**stab, click the Add icon .
- The Unit <x> section is added to the table.

To define a new unit, enter in the **parameter** ...

- ... **Name** a unique identifier - this will now be used instead of the number.
- ... **Symbol** specify a unique formula character. User-defined units are displayed together in the selection lists in the <name> (<symbol>) format - in the case of pre-defined units, however, only the symbol is displayed.
- ... **Physical quantity** indicates the physical size for which you are adding the new unit.
- ... **Derived from** indicates the predefined unit from which the new unit is derived.
- ... **Gradient m** the factor by which the value in the predefined unit is multiplied for conversion to the new unit.
- ... **Offset n** the offset which will be added during the conversion (optional).
- ... **Format-String** Format string the display format of the user-defined unit in the displays ⇔ [Display formats and format strings](#) (p. 199)

### Example

By default, the units meter (m) and millimeter (mm) are predefined in enSuite for the physical quantity length. To define the unit centimeter (cm), parameterize the following values:

Unit centimeter	
Name	Centimeter
Symbol	cm
Physical quantity	Length
Derived from	m
Gradient m	100
Offset n	0

The new unit centimeter (cm) is available in the unit set of physical quantities.

### Delete user-defined unit

You can delete user-defined units by selecting the Range **<Name>** line and clicking the Remove icon .

Note that a user-defined unit is also deleted if it is used in the parameterization. In this case, the parameterization becomes invalid; invalid references are displayed in red font color as usual, so that you can correct the references manually.

## Display formats and format strings

Format strings are used to define the display format of units. You can easily define display formats for predefined and user-defined units using graphical controls (display format editor). Alternatively, you can adjust the format string manually.

To change the display format for a predefined unit, open the **Display formats** tab in the Basic system  - Unit Service  branch.

- Select the physical size from the drop-down list (first row) for which you want to adjust the display format of a unit. All related (predefined) units with format strings are listed in the table. Select the row with the desired unit.

To change the display format for a user-defined unit, open the branch Basic system  - Unit service  - User-defined units .

- On the Parameters tab, select the desired user-defined unit or add a new unit. Select the format string.

The further steps are the same for predefined and user-defined units:

In the lower part of the tab, the controls are displayed to change the display format. The current values of the format string are preset. Change the format using the selection buttons and lists.

Regardless of the selected display format, your changes will be immediately implemented as a format string in the Format String column.

If required, you can restore the predefined display format at a later time with [**Restore default**].

## Define basic display and edit display behavior

Normally the displays do not have to be edited. If you have the appropriate rights, you can do the following (In the parameter tree, select "Display" as shown below):

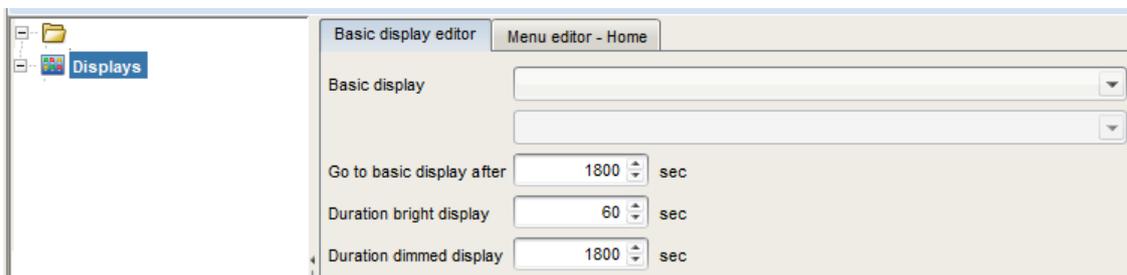


Fig. 8-19: Editing the display

On the right-hand side of the parameterization window, there are various settings and options available in the Basic display editor tab.

- **Basic display**  
Using the 2 selection menus you can define which display or sub-display the device shows first when it is switched on or restarted. You can define the AFB in the first selection menu. The second menu is to select any sub-displays.
- **Go to basic display after**  
Here you can define after what time the system quits the current display and returns to the basic display. Do not make this time too short since after a break in editing above this time, you will have to reopen the previous display, making your work more difficult.
- **Duration bright display**  
If a bright display is not used for a lengthy period, it will dim. You can define the time after which it will dim here.
- **Duration dimmed display**  
If a dimmed display is not used for a lengthy period, the screen will be shut down. You can define the time after which it will shut down here.

The device displays are also listed on the right-hand side of the parameterization window in the Menu editor – Home tab. If you have the appropriate rights, you can use the context menu and the symbols on the right-hand edge to make various changes to settings.

## 8.2.5 User and rights management

The user and rights management of enCore devices makes it possible to determine which changes users are able to make on the device in a very detailed manner. Rights are managed centrally via user profiles. Various users can be allocated to each profile. Since the users inherit the rights of their profile, changes to the rights of a user profile always automatically affect all users with this profile.

Changes on the device can only be carried out after the user has successfully logged in. Users can only make the changes their user profile entitles them to make. To ensure data consistency, only one user can be logged into the device at any one time. In addition to this, data which has been changed is only saved in the device when the user explicitly confirms the final acceptance of the data by means of an action. Each change made on the device is reported with an indication of the action, the user name and the date and time. Login to and logout from the device are also saved in the audit trail.

Read-only access to the device, however, does not require a user to log in, for example the reading of archives or the reading of the parameterization.

In addition to the rights for user profiles, devices can also be protected for use in legal metrology by means of security settings which comply with the approval. In this way, it is possible to ensure that fiscally relevant changes can either only be made when the security switch is open or are reported in the fiscal audit trail.

enCore devices distinguish rights at parameter level and rights at system level:

- Rights at a parameter level  
Authorizations can be assigned in a very differentiated manner for individual parameters or parameter ranges of an application. For example, changing alarm limits or units.  
⇒ [Rights at a parameter level](#) (p. 206)
- Rights at a system level  
These rights determine which system settings of the device can be changed. This includes changing the device time.  
⇒ [Rights at a system level](#) (p. 208)

User and access rights are saved per parameterization.

User and rights management is saved by parameterization and divided into the following areas:

- ⇒ [Managing user profiles](#) (p. 202)
- ⇒ [Managing users in enSuite](#) (p. 203)
- ⇒ [Managing access rights \(administrator only\)](#) (p. 205)
- ⇒ [Overview of user profiles and their authorizations](#) (p. 212)
- ⇒ [7.3.6 Display and operation](#) (p. 132)
- ⇒ [Perform parameter changes via displays](#) (p. 133)

## Managing user profiles

The enCore authorization concept is based on role-based access control. Up to six different roles can be created with six user profiles which are available in each parameterization. The rights are allocated by profile

The following figure gives an initial overview of the user profiles; the user profiles and users are described in detail below:

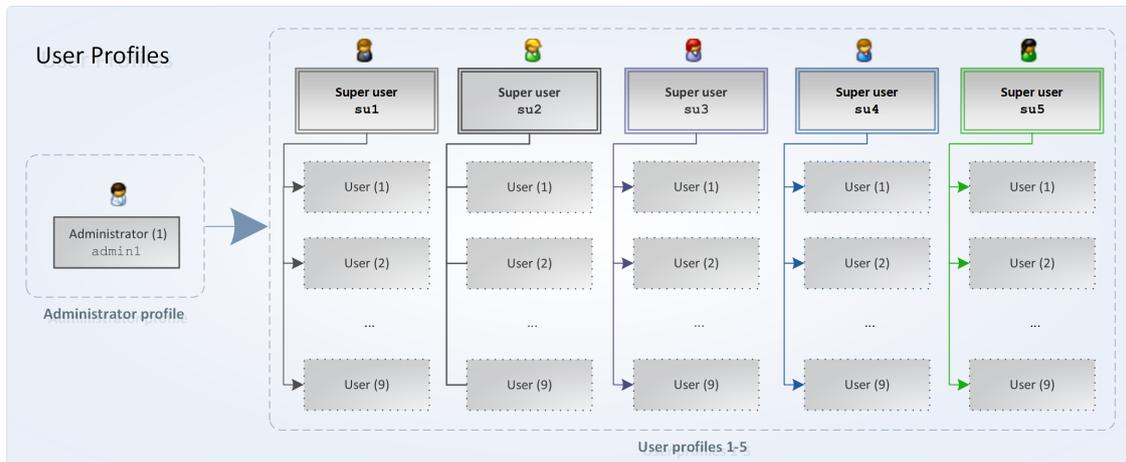


Fig. 8-20: Overview of user profiles

The administrator profile (Administrator) allows full access to the device and management of the other user profiles. It is intended for setting and transferring user management. By default, the rights and access management is not preset. User roles and passwords are assigned by the administrator.

The user profiles 1-5 consist of up to nine standard users plus one super user. Users inherit the authorizations of their profile. The five super users also have the right to manage the users in their own profile, in other words they can add users to their group, delete them from the group or change user names. Only the administrator can manage super users of the user profile.

A user can only ever belong to one profile. Each user has login details made up of a user name and a password. It is possible to log in to the device locally or remotely via the network. The device checks the login details, in other words the user must be known in the parameterization of the device.

A unique symbol and a unique position are allocated to every profile in enSuite:



Fig. 8-21: User profiles with unique symbols and a fixed position



### Standard login of standard users

There are super users in each parameterization. enSuite creates these users in a newly created parameterization with the following access names and an empty password in each case:

- Administrator: **admin1**
- Super user: **su1** to **su5** (“Super User”)

These users are always present and cannot be deleted. The login details for the administrator and the super user can be changed.



### NOTICE

#### Assign password at first login to the enCore device!

In delivery state, user passwords are not set for standard users. Even if you create a new user in enSuite, enSuite creates these users without a password.

We strongly recommend that each user changes his or her password at the first login to the device. ⇨ [Change password](#) (p. 136)

## Managing users in enSuite

The branch **Users** – <Profile name>.e.g., **User profile 1** Tab **User list** lists all users of this profile. Except for the administrator profile, in field **Profile name**, you can enter a permissible meaningful name for the user profile which, for example, describes the function of this profile, such as Technician or Metrologist. This name is used in node **Users.<Profile name> profile**.e.g., **Users.Technician profile**



### Permissible user names

When choosing a user name, please note:

- The name can be made up of 3 to 10 permissible characters.
- It must be unambiguous in the parameterization, in other words it may not appear several times.
- No distinction is made between upper case and lower case letters.
- All the letters from a through a through z (or A through Z) and the numbers 0 through 9.
- Special characters such as e.g., \_ - . \* [ { | # , \ are not permissible. **Change the name of a user**  
(Refer also to ⇨ [Change password](#) (p. 136))

**Add a new user** (Refer also to ⇔ [Change password](#) (p. 136))

- 01 In offline parameterization open the required user profile in branch  **Users** – **<Profile name>**.e.g.,  **User profile 1** Tab **User list** lists all users of this profile .
- 02 Click the Add symbol 
- 03 Enter a permissible user name into the **Create user** dialog. e.g.,PSchmidt. As soon as your entry is permissible, enSuite will activate the **[OK]** button.
- 04 Confirm your entry with **[OK]**.The user is created with the login details **<User name>** and an empty password.
- 05 Log on to the enCore device and assign a secure password.

**Delete a user**( **<admin1>** and **<su1>** through **<su5>** cant be deleted)

- 01 In offline parameterization open the required user profile in branch  **Users** – **<Profile name>**.e.g.,  **User profile 1** Tab **User list** lists all users of this profile.
- 02 Mark the required name in the list and click the remove symbol .  
The user will be removed from the list without confirmation.

**Change the name of a user** (Refer also to ⇔ [Change password](#) (p. 136) )

- 01 In offline parameterization open the required user profile in branch  **Users** – **<Profile name>**.e.g.,  **User profile 1** Tab **User list** lists all users of this profile
- 02 Mark the required name in the list and click the Edit symbol . In the **Edit user** dialog, a warning will appear that if you change the name the associated user password will be deleted.
- 03 In the **User name** field, enter a permissible user name. Soon as your entry is permissible, enSuite will activate the **[OK]** button. .
- 04 Confirm the name with **[OK]**. The changed name is displayed in the list. The old password is deleted.
- 05 Log on to the enCore device and assign a secure password.

## Managing access rights (*administrator only*)

Access rights determine which parameters or system settings a user may or may not change on the device. The access rights are managed exclusively by the administrator in the expert mode.

Rights are assigned per user profile. In addition to this, changes to the device are protected by the following security settings:

- Protection of the security switch  (at a parameter and system level)

Changes which are under the protection of the security switch in addition to a user profile can only be transferred to the device or changed on the device when the security switch is open. Country-specific regulations may specify that only an authorized group of people is permitted to open and close the security switch. This protection is the highest security setting on the device.

- Fiscal audit trail  (only at a parameter level)

As an alternative to the protection of the security switch, parameters can also be labeled fiscal audit trail . Changes to these parameters are reported in the Fiscal Audit Trail. In this way, legally relevant parameters can be changed even when the security switch is closed provided the fiscal audit trail is not full (maximum of 1,000 entries).

When the security switch is open, these changes are not logged in the fiscal audit trail.

The fiscal audit trail  setting is less strict than protection by the security switch.



### Erasing the fiscal audit trail

The fiscal audit trail can hold a total of 1,000 entries. As soon as the logbook is full, parameters which are labeled fiscal audit trail  can only be changed again when the entries are removed using the action [Erase fiscal audit trail](#).

A requirement for this is that the user has the **Erase fiscal audit trail/fiscal archives** right. This action should also be protected by the security switch.

⇔ [Rights at a system level](#) (p. 208)

In the case of devices used in legal metrology, these additional security settings come from an approval file, which reflects the specifications of the notified body for the authorized use. The minimum fiscal requirements are described in an approval file of this type. Furthermore, a standard approval file can be defined for a device, which is not part of the fiscal approval but merely sets out common security settings.

Rights are managed in enSuite with the help of symbols. Wherever rights can be assigned at a parameter or system level, a toolbar is shown in the column **Rights** or **Authorization**.

The toolbar is divided into two and is made up of up to seven buttons:



Buttons 1 through 5: Rights for user profiles

Each button is allocated a unique symbol for user profiles 1 through 5.<sup>1</sup> The order corresponds to the position of the profiles in the user management.



Buttons 6 through 7: fiscal security settings

Button 6 is allocated to the symbol for the protection of the  security switch and button 7 to the symbol for the  fiscal audit trail. Button 7 is only displayed at a parameter level.

In general, the following applies: Only when a symbol is enabled does the user profile have the corresponding right (buttons 1 through 5) or do these (fiscal) security settings apply (buttons 6 through 7).

### Rights at a parameter level

At a parameter level, only a reduced toolbar is displayed in enSuite as a standard in which the rights for the user profiles are faded out.

## Managing rights in enSuite

Prerequisite(s)

- The required offline parameterization is open in expert mode.
- The user who is transferring the parameterization to the device has administrator rights.

### Show extended toolbar for assigning profile rights

01 Open node **<Device>**.

In the upper area of tab **Configuration** the fields for virtual login and checkbox **Edit user rights** will be displayed.

Only the administrator can edit user rights. If a user without administrator rights is already virtually logged in to enSuite, the checkbox **Edit user rights** will be inactive (grayed out) and will not be evaluated.

02 In this case, clear checkbox **Use virtual login** or log in to enSuite virtually as administrator (standard login **admin1**).

03 Select the checkbox **Edit user rights**.

In the entire parameterization, the extended toolbar for assigning rights will be displayed in the column **Rights** or **Authorization** and you can assign the rights for user profiles 1 through 5.

---

<sup>1</sup> The administrator already has all rights which can be parameterized in enSuite, so there is no button for the administrator profile.



## Grant right to change entire tab

01 Enable the desired button on the tab for the user profile or user profiles.

The setting will be adopted for the entire tab, shown here using the example of user profile 3 :

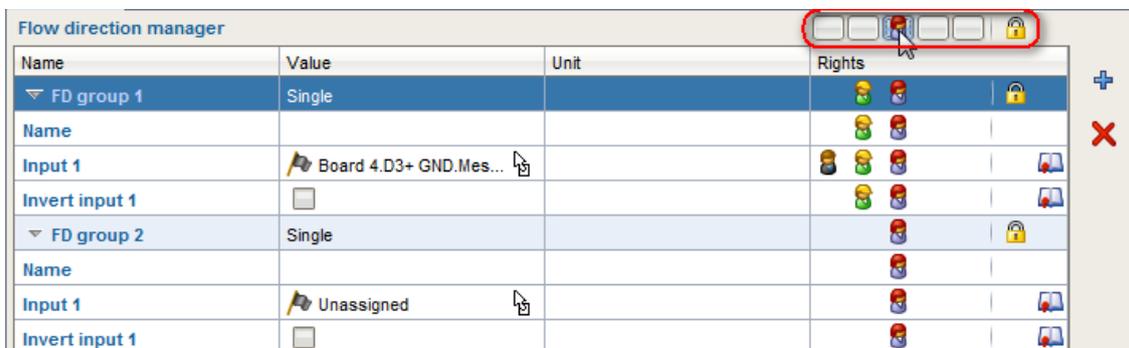


Fig. 8-24: Changing rights for an entire tab – example **Flow direction manager**

The inherited right for an area or parameter can in this case only be disabled at the tab level but not for individual areas or parameters.

The parameterization with the changed user rights and security settings becomes effective as soon as it is transferred to the device.

## Rights at a system level

Using the rights at a system level the administrator is able to determine in a differentiated manner which users changed which device settings or carried out which actions. These settings and actions can also be protected by the security switch.

## Managing rights in enSuite at a system level

Preparation(s)

- The required offline parameterization is open in expert mode.
- The user who is transferring the parameterization to the device has administrator rights.

01 Switch to **<Device>** –  **Users, Special user rights** tab.

The following sections list all system level actions for which you can assign an authorization in enSuite.

## Actions for special user rights

### Action “Accept errors without login” <sup>1</sup>

The acceptance of the error list is possible without logging in. (*default*)

#### Access on the device

 **Error list** – [Accept all](#)

---

### Action “Accept errors” <sup>2</sup>

Only authorized user profiles can accept the error list. This can also be protected by the security switch.

#### Access on the device

 **Error list** – [Accept all](#)

---

### Action “Erase fiscal audit trail/fiscal archives”

Two actions are summarized under this right:

#### (1) Erasing the fiscal audit trail

The fiscal audit trail has a maximum depth of 1,000 entries. As soon as the fiscal audit trail is full, no more parameter with the access right  can be changed if the security switch is closed – not until the fiscal audit trail has been deleted.

#### Access in enSuite (navigation branch)

**My devices** – <Device> – [Erase fiscal audit trail](#)

OR

**My devices** – <Device> – [End of commissioning](#)

#### Access on the device

 **System** –  <Audit trail>, select entry **Fiscal**, [Erase fiscal audit trail](#)

#### (2) Clearing fiscal archives (*DSfG AFB only*)

---

### Action “Modify displays”

Transferring parameterization with changed displays to the device. Pre-defined standard displays can be changed if they are not read-only; read-only displays are labeled with a lock . User-defined displays can also be created, edited or deleted.

#### Access in enSuite (navigation branch)

 **Displays** – <Folder> – [Folder – ] <Display(s)>

---

<sup>1</sup> Whether or not only errors which are no longer pending can be accepted or whether errors can always be accepted can be determined in branch **Basic System** – **System**, section **Error list** with parameter **Acceptance procedure**.

<sup>2</sup> Whether or not only errors which are no longer pending can be accepted or whether errors can always be accepted can be determined in branch **Basic System** – **System**, section **Error list** with parameter **Acceptance procedure**.

**Action “Update device time”**

Set internal system time in the device.<sup>1</sup>

Access in enSuite (navigation branch)

My devices –<Device> –[Update date and time](#)

Access on the device

 **System** –  **Time Service** – [Date and time](#) – [[Update date and time](#) – ], [Update date and time](#)

**Action “Reset battery state”**

Display of the battery state of charge on the enCore device, e.g., reset to 100% after changing the batteries.

Access on the device

 **Info** –device monitor, [Reset battery status to 100%](#)

**Action “Modify AFB configuration”**

Change composition of AFBs.

Access on the device

<Device>, tab **AFB configuration**

**Action “Update non-fiscal firmware”**

All non-fiscal firmware modules (the checkbox is cleared in the **Fiscal** column) can be updated or restored to their last status.

Access in enSuite (navigation branch)

My devices – <Device>, action [Firmware configuration](#), [Make changes to firmware] OR [Restore to state before the last update]<sup>2</sup>

**Action “Update fiscal firmware”**

All fiscally approved firmware modules (the checkbox is selected in the **Fiscal** column) can also be updated or restored to their last status..

Access in enSuite (navigation branch)

My devices –<Device>, action [Firmware configuration](#), [Make changes to firmware] OR [Restore to state before the last update]

<sup>1</sup> The Time Service distinguishes between synchronization and adjustment of the system time.  
 ⇨ enCore manual “Basic System with SFBs”

<sup>2</sup> Relates to all *non-fiscal* firmware modules, in other words modules for which the checkbox in the **Fiscal** column is *cleared*.

### Action “Update approval file”

Select another approval file.

#### Access in enSuite (navigation branch)

Action **Firmware configuration**, column **Firmware module** value **approval**, in column **Current** select approval file, **[Make changes to firmware]**

### Action “Change general system settings”

Various actions are summarized under this right:

- delete TLS certificate resp. Reboot and create certificate

#### Access on the device

 **Info** –<device serial no.>, [Delete certificate](#)

OR

 **Info** –<device serial no.>, [Reboot and create certificate](#)

- enable/disable test mode for MFA8 boards

#### Access on the device

 **System** – I/O –<x>, **MFA8: Test mode: On/Off**

- enable/disable maintenance mode of the Flow Conversion AFB

#### Access on the device

 <Main display of Flow Conversion AFB>, [Maintenance\\_mode](#), **Maintenance mode: On/Off**<sup>1</sup>

- enable/disable the HART loop for test and service purposes (*only* multidrop mode)

#### Access on the device

 **System** – **Intelligent measurement devices, HART loop [more...](#), Loop active: Yes/No**

- LF-HF counter comparison: reset comparison counter and deviation

#### Access on the device

 **System** – **Tools, counter comparison LF-HF [more...](#), [Reset](#)**

01 To give a profile the right to perform an action, enable the corresponding profile symbol in the authorization column.

⇒ [Managing rights in enSuite](#) (p. 206)

02 If necessary, you can also place an action under the protection of the security switch.

The parameterization with the changed user rights and security settings becomes effective as soon as it is transferred to the device.

#### General parameters

- Open branch <Device> – **Basic System** –  **Users**.
- Switch to **Parameter** tab.
- The following table lists the general parameters you can assign on this enSuite page.

<sup>1</sup> DSfG AFBThe AFB is not available for every enCore device type.

**Action: “Inactivity timeout”**

Enter the time period after the expiry of which a user is automatically logged off from the enCore device due to inactivity – the standard value is 120 min. Changes which have been made but not accepted will be discarded. The timeout takes effect, for example, if a user is logged in to the device remotely and ends enSuite without logging out of the device beforehand.

**Action: “Authorization mode”**

enCore devices support two modes for log-on to the device:

- *Password* (default)

In this mode, the <user name> and <Password> are required when logging on to the device. This is the default log-on.

- *Security switch*

In case the security switch is open, the <user name> is sufficient. This mode is intended for special cases only, e.g. it simplifies the maintenance operations and commissioning of the device since the password is not required.

Make sure that this mode complies with the security guidelines in your company.

For both modes, the user can only perform the changes and actions at the devices, to which the associated user profile is authorized.

**Overview of user profiles and their authorizations**

The following table provides an overview of the various authorizations of the administrator profile and user profiles 1 through 5:

Right	 Admin.profile	 User profile 1 - 5	
	Admin.	su1 - su5	User
change own password	✓	✓	✓
manage users in own profile	–	✓	–
manage users in other profiles	✓	–	–
manage authorizations	✓	–	–
change (fiscal) security settings (  or  )	✓	–	–
changing parameters ( $\triangle$ changes at a parameter level)	(✓) <sup>1</sup>	–/(✓) <sup>1,2</sup>	–/(✓) <sup>1,2</sup>
changing system settings ( $\triangle$ changes at a system level)	(✓) <sup>2</sup>	–/(✓) <sup>1,2</sup>	–/(✓) <sup>1,2</sup>

Table 8-1: Overview of user profiles and their authorizations

1 If the change is under the protection of the security switch, the change is only permitted when the security switch is *open*.

2 Whether parameters or system settings can be changed by a (super) user of the user profiles 1 through 5 and if so which parameters or system settings is managed by the administrator.

## Suggested permissions (GQ devices)

You should only ever assign user profiles 1-5 the minimum permissions required to perform a task. This role-based authorization concept is another tool for increasing data security. Six different roles can be implemented. The following table gives an example overview of a few roles and use cases of the permissions proposed by Honeywell:

 <b>Administratorprofil</b> <b>enSuite</b>	<p><b>Main actor(s):</b> Device owner / Station Operator</p> <p><b>Goals:</b> System- / Device-Management</p> <p><b>all rights at system level and at parameter level exists (no adaption necessary)</b></p> <p><b>Use case:</b> Creating and deleting users / assigning rights / assigning passwords</p>
 <b>one of the</b> <b>User profiles 1–5</b> <b>enSuite</b>	<p><b>Main actor(s):</b> Honeywell Service Technician / Technical Support Service technician with additional qualification (authorized in legal metrology)</p> <p><b>Goals:</b> Mount device / configure device functions / change software (legally relevant, operational) / adapt parameterization to measuring point / open and close security switch / ensure correctness of the official measurement / seal device</p> <p><b>required rights (administrator rights without user management)</b>  <b>All rights at system level / All rights at parameter level (Rights must be adjusted)</b></p> <p><b>Use case:</b> Service technician commissions the device in legal metrology or operationally or carries out essential changes to the operating mode or repair measures. Honeywell Technical Support supports service technicians, technical personnel and controllers in their activities</p>
 <b>another one of</b> <b>User profiles 1–5</b> <b>enSuite</b>	<p><b>Main actor(s):</b> Honeywell Service partner / Metrologie-Expert with HONEYWELL Training</p> <p><b>Goals:</b> Open and close security switch / erase fiscal audit trail/fiscal archives / change legally relevant parameters according to the approval file / change legally relevant software on the device / ensure correctness of the official measurement / seal device</p> <p><b>Minimum required rights (Rights must be adjusted)</b>  <b>rights at system level:</b> Change device system time / Reset battery status / Change AFB configuration / Change legally relevant and operational software / Change general system settings / Erase fiscal audit trail/fiscal archives / Change approval file.  <b>rights at parameter level:</b> Right to change all parameters that are protected by security switch  according to the approval file. / Change rights around operational AFBs</p> <p><b>Use case:</b> Authorized metrology expert carries out legally relevant maintenance.</p>
 <b>a third profile of</b> <b>the User profiles</b> <b>1–5</b> <b>enSuite</b>	<p><b>Main actor(s):</b> Qualified personnel with HONEYWELL training e.g. electrician / gas specialist</p> <p><b>Goals:</b> Goals: Regularly change a defined set of parameters, e.g. adjust values of the gas component table / change operational software / delete operational archives / perform calibrations / perform maintenance</p> <p><b>Minimum required rights (Rights must be adjusted)</b>  <b>rights at system level:</b> Change displays / Change device system time / Reset battery status / Change AFB configuration / Change operational software / Change general system settings  <b>rights at parameter level:</b> rights to change the required set of parameters, z. e.g. gas quality values / gas composition</p> <p><b>Use case:</b> Technical staff carries out operational maintenance work</p>
 <b>Rest of the</b> <b>User profiles 1–5</b> <b>enSuite</b>	<p><b>Main actor(s):</b> User without HONEYWELL training e.g. Controller.</p> <p><b>Goals:</b> readout archives / readout parametrization / view and accept error list</p> <p><b>no adjustment of rights necessary (default setting allows read-only access)</b></p> <p><b>Use case:</b> Employee reads out non-sensitive data from the measuring device</p>

Fig. 8-25: Proposed permissions

## Login prompt

For working on protected settings, a **login prompt** will automatically appear when you start the action. To log in, you will require a **user name** and **password** which the system operator, acting as the administrator, or the super user of the profile will have prepared for you. Please request these data.

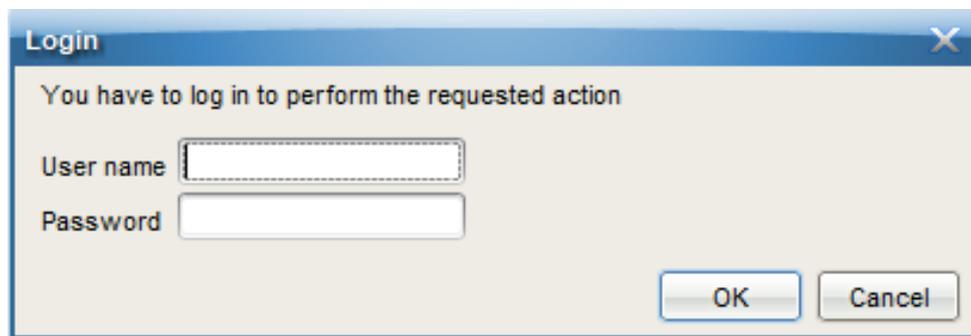


Fig. 8-26: Login dialog window



After a failed login attempt, the next login is blocked for a certain period of time for security reasons. With each additional failed attempt, this time period is extended.

## Check login status

Select the entry **Parametrize online** in the lower section of the navigation window. If you are not logged in the **Login prompt** will appear.

If you are logged in, online parameterization will open and you are able to click on the top-most folder in the parameter tree, select the tab with login information, as shown.

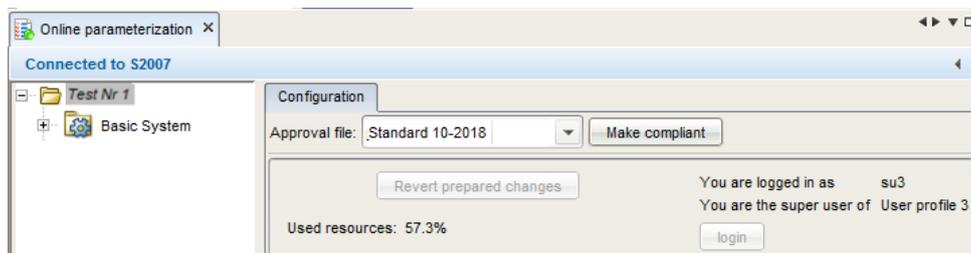


Fig. 8-27: Online parameterization user logged in

If you have been logged off during the online parameterization was open e.g. by other users on device or on the remote panel, the tab will change and give the option to log in again.

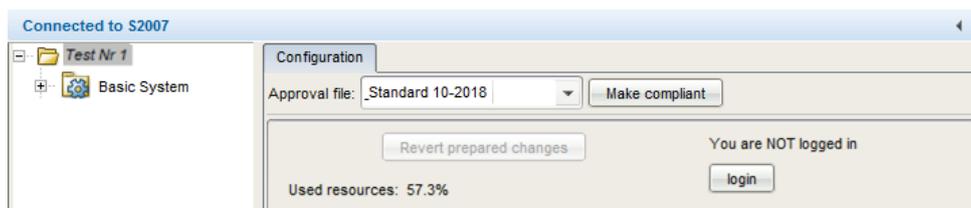


Fig. 8-28: Online parameterization login option

## Virtual login (restriction of editing options)

In offline parameterization enSuite opens a parameterization with administrator rights as a standard so all parameters are displayed and, due to the expanded authorizations of the administrator, are also editable. Even those parameters which can only be changed on the device when the security switch is open can be edited.

For the changes to a parameterization to be able to be successfully transferred to a device (subsequently), the user who is logged in to the device must have access rights for all parameters which were previously changed in offline mode.

If the parameterization has changed parameters which are under protection, the device will reject the transfer of the entire parameterization.

With virtual login, enSuite offers an option to filter a parameterization in advance by the authorizations of the desired user profile and the status of the security switch. In this way, you can ensure that a user is really entitled to transfer a changed parameterization successfully to a device.

### Requirement:

- You have selected offline parametrization ⇨ [8.3.1 Offline parameterization](#) (p. 229).
- The parameter set is open and the topmost folder (device) is marked. In the right-hand section of the window you will see the “**Configuration**” tab (with the possible selections shown)

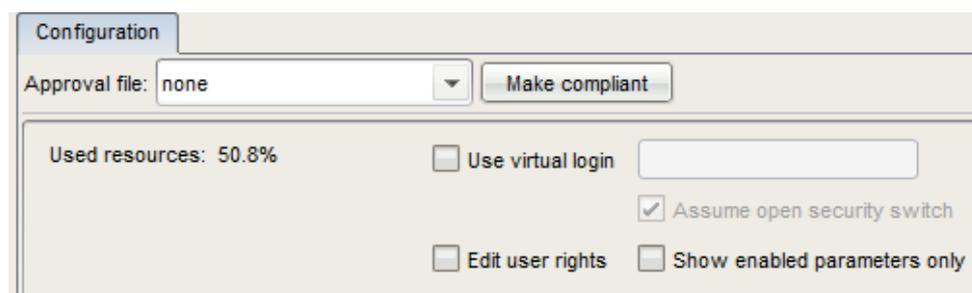


Fig. 8-29: Use virtual login

In the **Use virtual login** field, only a user name must be entered, a password only needs to be entered to transfer the data. In this way, you can also parameterize parameterizations for other user profiles in advance. When a user has successfully logged in, a green checkmark will be displayed behind this name field.

Non-editable parameters are listed now in gray in the parameter lists and are labeled with the symbol . If you deactivate the option **Assume open security switch**, then all parameters under security switch protection can no longer be edited either.

By using the option **Show enabled parameters only**, you can achieve that any such parameters are not displayed at all.

To display all the parameters again regardless of their access rights, disable the checkbox “**Use virtual login**”. You will now see the existing setting options under Parameters.

### Assigning or changing a password (online parameterization)

Connect to the device and select “Parameterize online”. A login prompt will appear in which you must log in as the administrator or super user (for example, SU3). Click on “OK”.

You can only log in if no other login is active on the device.

The parameter set will be read after the login. Open the user management in the basic system and select the appropriate user.

Double-clicking on the user will open the following dialog box (see figure).

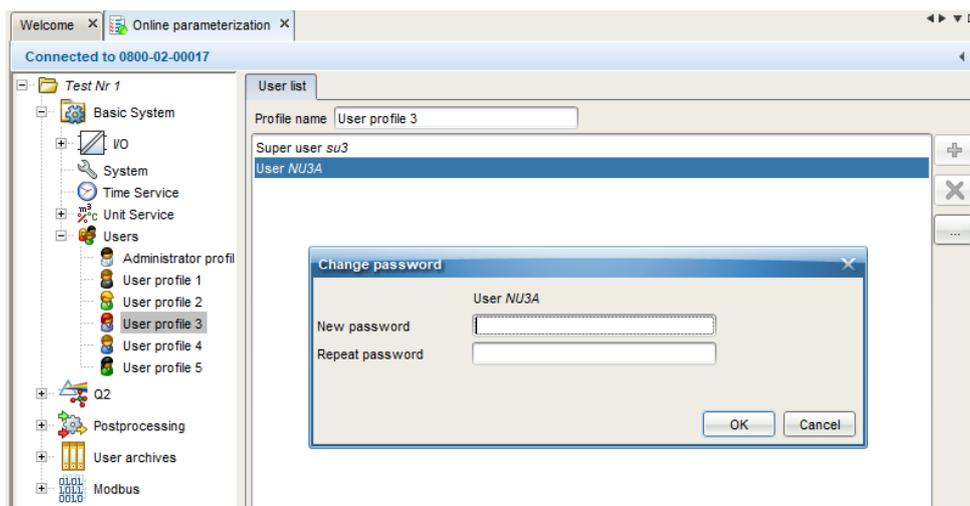


Fig. 8-30: Change password dialog (online parameterization)

Enter a legal password in both boxes in the dialog, obeying the instructions in the dialog. If your entry is valid, the [OK] button can be selected, and you can conclude your change by clicking on it. The new password is now active. After you have selected OK, you can break the connection.



Assigning or changing own password could also be done with the help of the remote operation panel.

See section System display (device) Users (Login/Logout/change password).

When carrying out any online work on the device, please note that an automatic logout will take place after a defined period of inactivity. (Further information about this inactivity timeout can be found in section .)

You will also be logged out when the connection to the device is disconnected e.g. by re-boot.

## Viewing position of the security switch

The security switch (calibration switch)  can physically establish or interrupt electrical connections within the device and thus prevent changes in addition to password protection and access rights. On delivery and in “non-fiscal operation”, this connection is open. More information in section [6.1.4 The hardware parameter guard \(SSW\)](#) (p. 95).

Also for this protection, which is not installed at delivery, the administrator must make the necessary settings, because some settings, as already mentioned, must be protected during official measurements.

Independently of the official measurements, the administrator has the possibility to put further device settings under this protection.

You can view the setting using online parameterization. After opening the online parameterization, the Configuration tab shows the current situation, see figure.

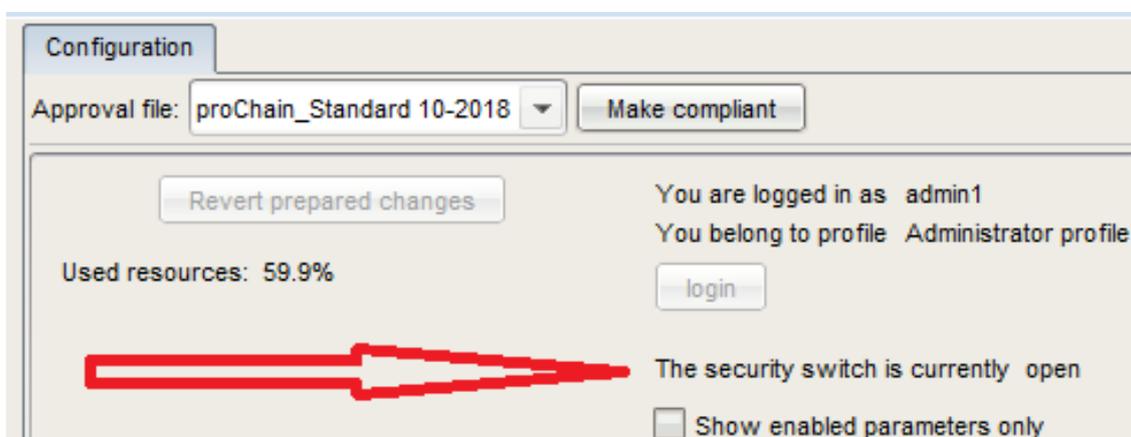


Fig. 8-31: View the SSW position



When the switch is closed, the text "**The security switch is currently closed**" is displayed. More information the online help of enSuite.

## 8.2.6 Fiscal parameters and optional using of approval file

For devices, which are intended to be used in legal metrology, the approval specifies which parameters are legally relevant. The editing of such parameters must be specifically protected or logged.

 There are two different types of access rights for legally relevant parameters:

-  Can only be changed if the sealable security switch is open
-  Can also be changed if the security switch is closed, provided the fiscal audit trail is not yet full. The change is logged in the fiscal audit trail

If the device is operated in accordance with a valid approval, then the following conditions need to be met in the parameterization:

- The access rights for legally relevant parameters must be set in line with the approval.
- The software versions of the fiscal software components must comply with the approval.

In order to ensure compliance with these conditions, please proceed as follows:

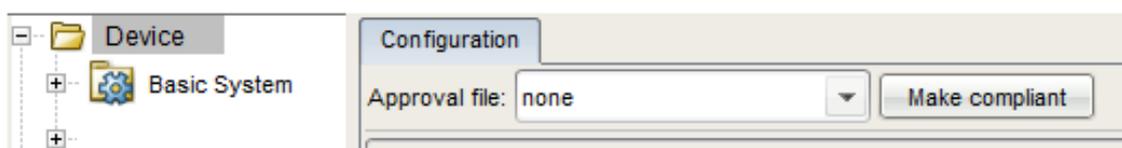


Fig. 8-32: Configuration – selecting the approval file

- 01 Select the approval to be applied in the Configuration tab, using the drop-down list. All parameters and parameter branches whose official access rights (i.e.  or ) deviate from the selected approval are now labeled in bold orange. A blue label indicates that official access rights have been newly added.
- 02 Now click on Make compliant. By doing this, the access rights for legally relevant parameters are set in line with the selected approval. The orange labeling is replaced by a blue one as the changes have not yet been saved.
- 03 Check the listing of AFBs in the Configuration tab. If an AFB is still labeled in bold orange here, then this means that a software version was selected here which does not comply with the approval. Select the correct version which is in line with the approval. (Versions in line with the approval are listed in black, and versions which are not in line with the approval are listed in orange. Versions that are not compatible with the current Basic System appear in red.) Then click on the Make compliant button.

- 04 Save the parameterization . The blue labeling of parameters and parameter paths then disappears.

This action does not make any changes to the values of parameters. After the changes are saved, all the colored markings will disappear. Transfer this compliant parameter set to your device to use it for fiscal measurements.



#### Approval file within enSuite / the device

There are various national approval files which define the fiscal parameters which must be monitored and the corresponding values in enSuite.

There are also files which allow this protection mechanism to be used for non-fiscal operation as well.

A special official approval file transferred and contained in the device's software determines which approval should apply for the device. It is possible to replace the approval file in the device via software configuration (see section )

During operation, the device checks whether the official access rights and the fiscal software component versions match the requirements of the approval file in the device. The selection in enSuite is used solely for support purposes during parameterization.

On the remote operation panel, you can see an identifying string for the approval file in the Info (system) display. If both the official access rights of the parameterization as well as the fiscal software component versions are in line with the approval file, then this text is black; the text is red in the event of any deviations.

Security switch and fiscal audit trail may also be used for devices that are not to be operated in accordance with an official approval. In such cases there are prepared unofficial "approval" files, including a file without any official access rights whatsoever.

All the AFBs available for the device will be listed in a table in the bottom section of the tab. They can be used with the appropriate rights to expand the Configuration AFB. See the online help for further information.



**If this protection is disabled, "none" (see figure) will be displayed. after "Approval file".**

## 8.2.7 Live data and trending actions in enSuite

EnSuite offers the possibility to view live data and trends of the device. First you have to establish a connection to the device ( See Establish connection to enCore device ). After you are connected to the device, you can right-click on the "Live data and trending" entry in the lower part of the navigation window. The parameters will then be read out from the device and a new window will open in the middle of the screen. (see figure)

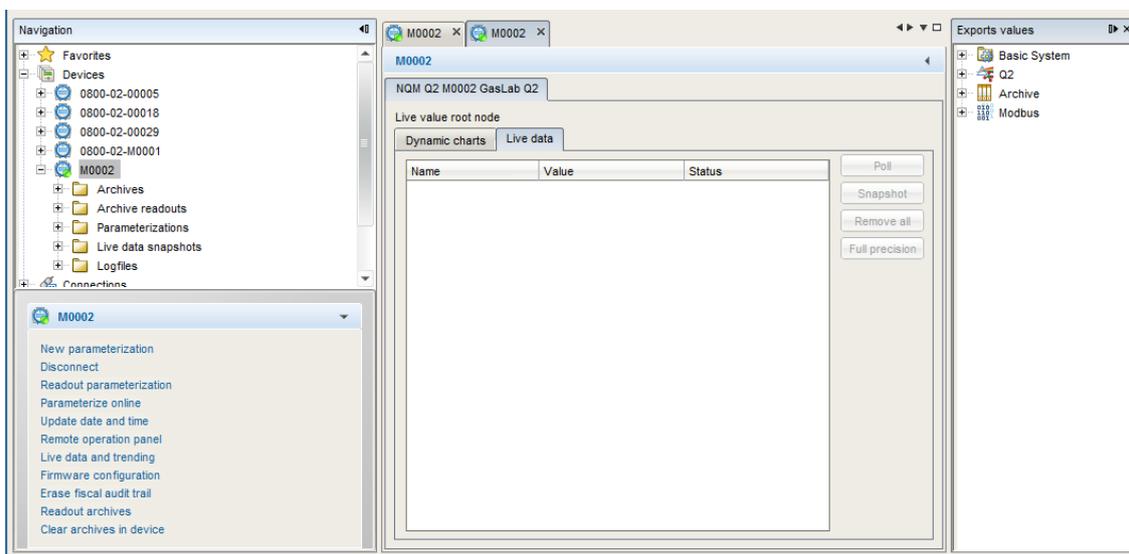


Fig. 8-33: Windows and tabs for "Live data and trending" function

There are 2 tabs in the window, "Dynamic charts" and "Live data". In the "Live data" tab, you can monitor lots of data simultaneously in number form. In the "Dynamic charts" tab, you can monitor the data in graphic form. There are only 2 physically different data items to observe since there is a maximum of 2 vertical axes. Several data items of the same type can be compared on each vertical axis, for example two temperatures (in °C).

### Examples of the "Live data" tab application

There is a window with all the available values in the device (parameter tree) on the right-hand side. Simply navigate to the required value, hold it and drag it into the center window (see the following screen section)

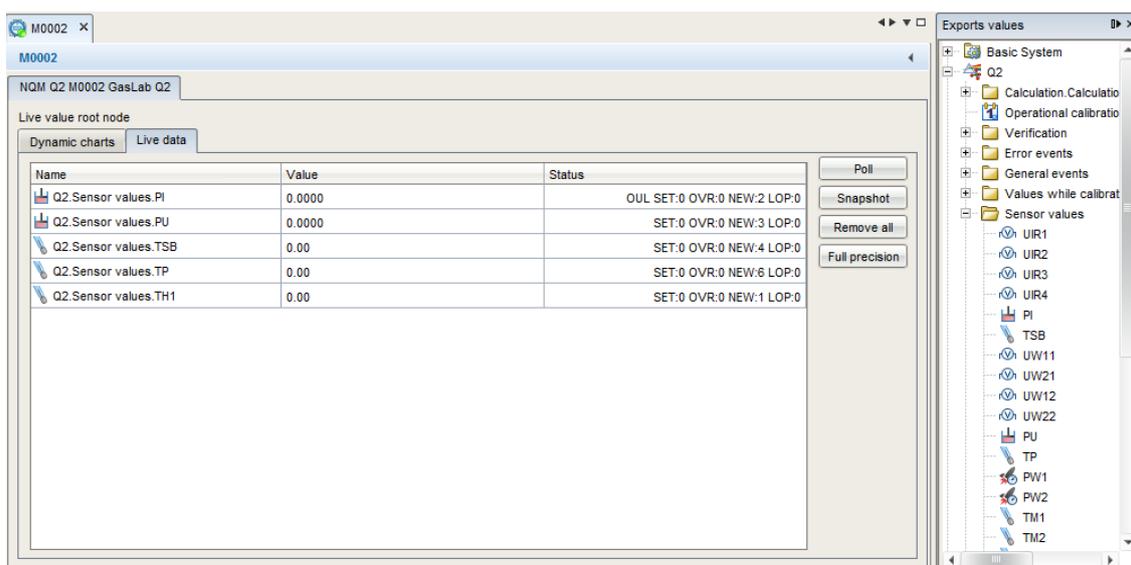


Fig. 8-34: Live data tab

If you wish to view a calculated value, for example the inferior calorific value, you can display all three different states of the gas (completely dry/completely wet/partly wet).

When you have dragged the required values from the right-hand window into the center, simply click on “Poll” and you will see values updated every second while the button changes to “Suspend”. If you click on “Snapshot”, the current value will be frozen and can be viewed in a new table sheet created at the same time.

Name	Value	Status
Q2.Sensor values.UIR1	479.44	SET:0 OVR:0 NEW:7 LOP:0
Q2.Sensor values.UIR2	1256.35	SET:0 OVR:0 NEW:7 LOP:0
Q2.Sensor values.UIR3	542.38	SET:0 OVR:0 NEW:7 LOP:0
Q2.Sensor values.UIR4	539.11	SET:0 OVR:0 NEW:7 LOP:0
Q2.Sensor values.PI	1.0079	SET:0 OVR:0 NEW:7 LOP:0
Q2.Sensor values.TSB	70.00	SET:0 OVR:0 NEW:7 LOP:0
Q2.Sensor values.UW11	2058.91	SET:0 OVR:0 NEW:7 LOP:0
Q2.Sensor values.UW21	3222.84	SET:0 OVR:0 NEW:7 LOP:0
Q2.Sensor values.UW12	1483.34	SET:0 OVR:0 NEW:7 LOP:0
Q2.Sensor values.UW22	2425.43	SET:0 OVR:0 NEW:7 LOP:0
Q2.Sensor values.PU	1.0206	SET:0 OVR:0 NEW:7 LOP:0

Fig. 8-35: Snapshot tab

If you click on “**Full precision**”, the display of the values will be extended to all the existing decimals. If you click on “**Remove all**”, the display window in the center will be cleared. Other examples include the following:

- Use as “**Device monitor**” to obtain information about the operating hours and battery charge and the CPU and RAM load. These data can be opened if the export values from “Device status” are used in the tab
- Use as “**Time Service display**” to provide information about the time setting and events and data linked to it. This information can be opened if the export values from “Time service” are used.



Details are given in the next sections.

### Examples of application tab “Dynamic charts”

Here you can select values which you wish to see in graphic form. To do so, drag the values from the right-hand window into the central area.

Please remember that these must be “Groups” (see above) if you want to display more than 2 values.

Once the required values have been positioned in the center window, click again on “Poll”. The values will then be displayed in a line diagram.

The button will change to “Suspend” (as shown below) and “freezes” the graphs when it is clicked until fresh values are displayed by clicking on “Poll”.



Fig. 8-36: Tab “Dynamic chart”

You can clear the central section again by clicking on “Remove all” and display other values in graphic form. The number values form the Y-axis, while the recording time is shown as the X-axis.

## Use “Live data tab” as Device monitor

Information about

- Operating hours
- Battery state of charge
- CPU load and Ram load

can be obtained if the system export values are used in the tab “Live data” as shown below.

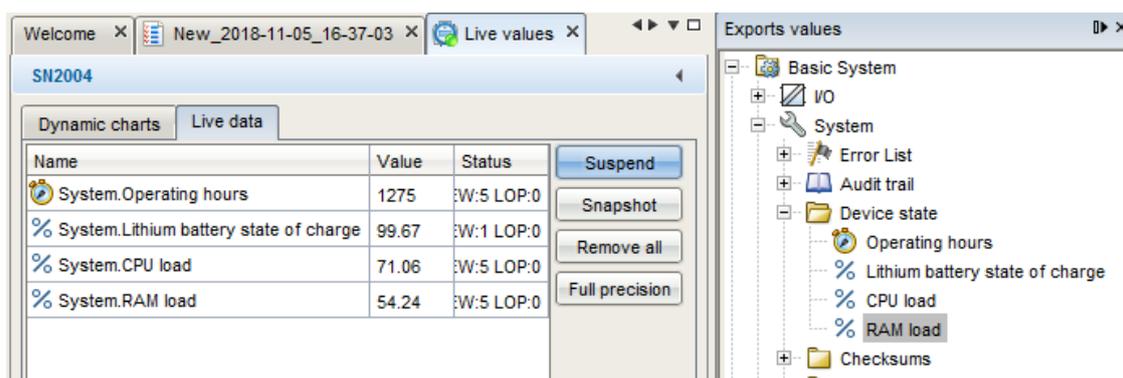


Fig. 8-37: System– Device monitor values

### Operating hours:

Elapsed hours that the unit has been on and running since manufacture.

### Battery state of charge:

Remaining battery charge in percent. (The battery is mainly used when the instrument is switched off. The message "Battery charge low!" is displayed when the battery capacity has dropped below 20%. The battery must then be replaced).

### CPU load:

Current utilization of the CPU in percent. (Message "CPU load high!" can optionally be displayed if a warning limit has been parameterized).

### RAM load:

Current load of the main memory in percent. (for information only)

## Use “Live data tab” to view Time Service data

Information around time setting, related events and data can be obtained, if the time service export values are used in the tab “Live data” as shown below.

Value	Meaning
Current time	System time
Latest update	Time stamp of the last time change.
Latest deviation	Deviation (in seconds) at the last time change
Latest external time source	Number of the external source for the last time synchronization
Daylight saving time	(DST) is the practice of advancing clocks during warmer months

The screenshot shows the 'Live values' window for 'SN2004'. The 'Live data' tab is active, displaying a table with the following data:

Name	Value	Status
Time Service.Current time	November 8, 2018 11:02:04 AM	SET:0 OVR:0 NEW:3 LOP:0
Time Service.Latest update	0	SET:0 OVR:0 NEW:0 LOP:0
Time Service.Latest deviation	0	SET:0 OVR:0 NEW:0 LOP:0
Time Service.Latest external time source	0	SET:0 OVR:0 NEW:0 LOP:0
Time Service.Daylight saving.Configuration invalid	0	SET:0 OVR:0 NEW:0 LOP:0
Time Service.NTP.Timestamp	November 8, 2018 8:02:17 AM	SET:0 OVR:0 NEW:1 LOP:0
Time Service.NTP.Duration since latest polling	3589	SET:0 OVR:0 NEW:7 LOP:0
Time Service.NTP.Latest deviation	-7197	SET:0 OVR:0 NEW:1 LOP:0
Time Service.NTP.NTP server	10.159.25.238	SET:0 OVR:0 NEW:1 LOP:0
Time Service.NTP.Stratum	1	SET:0 OVR:0 NEW:1 LOP:0

The right-hand pane shows the 'Exports values' tree structure for 'Time Service', including items like Current time, Current year, Current month, Current day, Current hour, Current minute, Current second, Latest update, Duration since latest update, Latest deviation, Latest external time source, Configuration invalid, Alarm time setting, Warning time setting, Alarm ext. time source, Warning ext. time source, Daylight saving: manual.Configuration invalid, NTP: enabled, Timestamp, Duration since latest polling, Latest deviation, NTP server, and Stratum.

Fig. 8-38: Time service main data



The Time zone (geographical location) and the setting of DST could be viewed in the parameter settings of **Basic system**. See next figure.

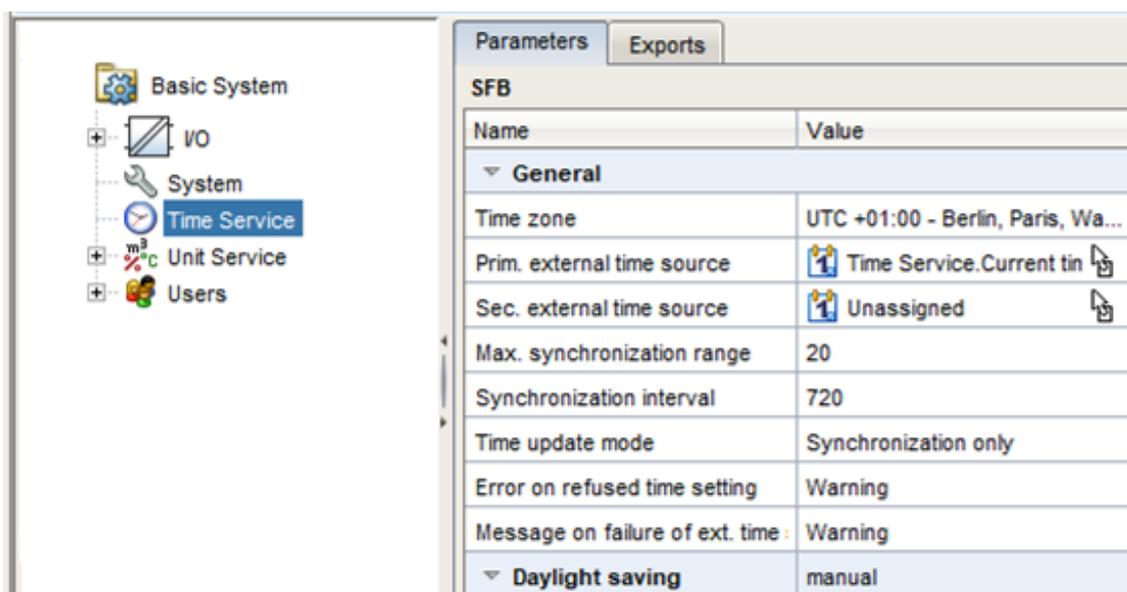


Fig. 8-39: Time zone (enSuite)

The Network Time Protocol (NTP) is a standard for clock synchronization in computer systems. It can be used if NTP synchronization has been activated in the device. Information about enabling and function see sections [7.3.5 System display Time Service \(System time and date\)](#) (p. 126) and [8.3 Notices about parameterization](#) (p. 228). Following data can be viewed (information also in the online help available).

**Time stamp:** Latest update of the last time synchronization using NTP. If a synchronization has already been completed, the precise time of the synchronization can be read in the display (date, time and time zone).

**Duration since latest polling:** the deviation (in seconds) at the last time synchronization using NTP shows by how many seconds the internal time deviated from the standard time at the last synchronization.

**NTP Server:** name or IP address of the NTP server used for the last time synchronization, for example ptbtime1.ptb.de or de.pool.ntp.org or company servers as in the figure.

**Stratum:** stratum value of the NTP server used for the last time synchronization (number of computers up to the time reference in the NTP hierarchy).

## Use “Live data tab” to view the Software status

In most enCore devices, a display called “Software status” shows information about the identification data of all the software parts in the device. The data comprise the name of the software parts, the version number and the checksum. These data can also be displayed using enSuite functions “Software configuration” and “Live data”.

Use the “Software configuration” tab to display the software status.

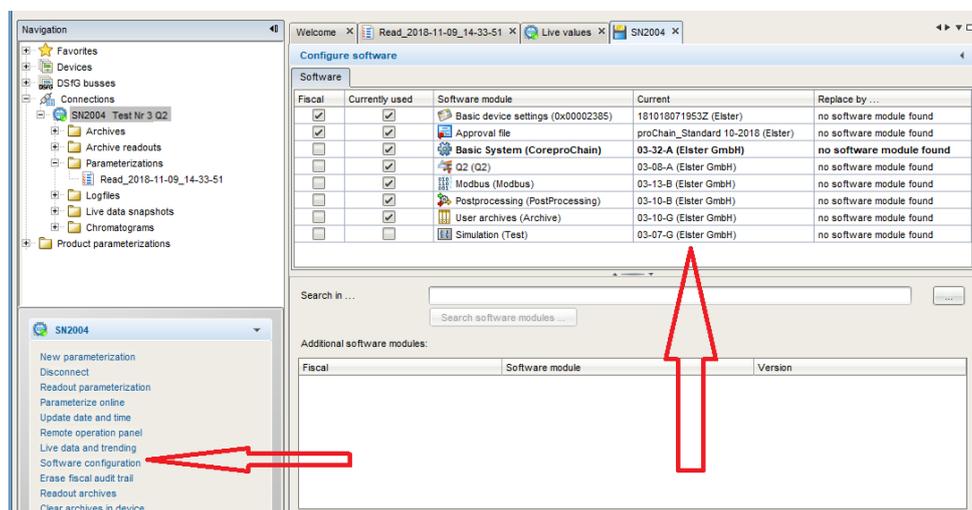


Fig. 8-40: Software configuration info

The software configuration lists the names of the main software parts in the column headed Software module. The next column Current contains the software version numbers of the components.

The second line of the tab shows the short name of an approval file. This file contains the definition of which parameters should be protected from changes so that the device can be operated to the customer’s specification or approval. Further information ⇨ [8.2.6 Fiscal parameters and optional using of approval file](#) (p. 218).

Operation without an approval file is also possible. In this case, “none (Elster)” is displayed. If the device is operated with an approval file and a closed SSW, the appropriate parameters are protected to prevent them being changed.

Use the “Live data” tab to obtain information about the software checksum, third column of missing “Software status” display. To do so, drag the export values out of the checksum folder under “System” into the tab’s table.

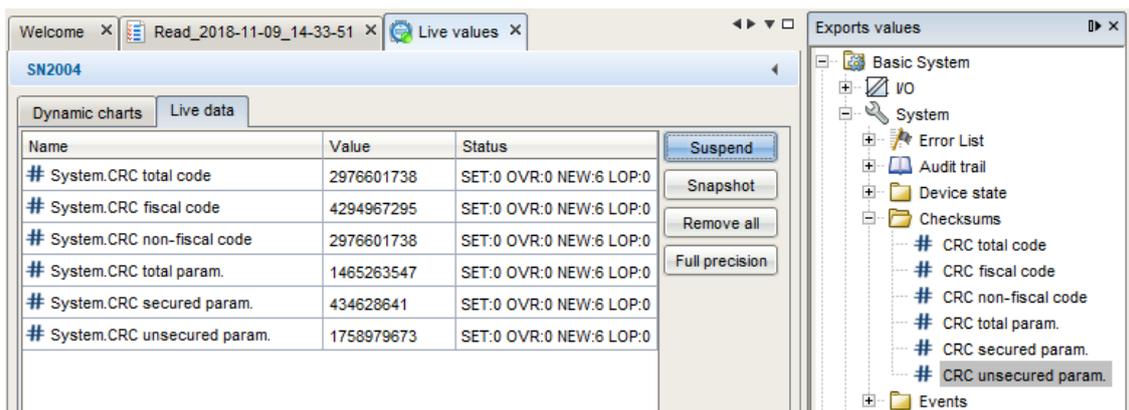


Fig. 8-41: Software checksum info



The above figure only shows examples.  
If, for example, the device is not used for fiscal measurements, the “Secured parameters” display will not be supported.

The Value column contains the appropriate checksum (after clicking on Poll). During operation, the actual checksums are calculated and compared to the reference values.

If a checksum discrepancy is identified an error is generated. To check this, add the relevant points listed under Event additional in the live data tab.

## 8.3 Notices about parameterization



On delivery, the device will always have a default or factory parameter set (called device parameter set or device parameterization). This only must be adjusted if necessary. Consider: Any change of this settings runs the potential risk of the device being set incorrectly!

Parameterizations differ in type and scope. They may only be suitable for one device or for one device series, and may be copied, shortened, extended or have their content changed.

The parameterization work can also be done in different ways, either directly in the device (online) or in advance on the PC (offline) with later transfer.

In the help window of enSuite **online help** you will find the folder **Parameterization (in general)** located under **About enSuite**. In this folder the subfolders and branches all essential terms and properties of the parameterization are explained.

Below you will find some additional hints:

- The user and rights management of enCore devices makes it possible to define in detail which changes users may make. This is the responsibility of the administrator, who in turn has unrestricted access to the device. ⇨ [8.2.5 User and rights management](#) (p. 201)
- To reduce the risk of incorrect changes which may render the device useless, the administrator should block actions which are not required by other users during normal operation. For example, these include editing the approval file, Configuration AFB and both non-fiscal and fiscal software.
- You must always be logged in when making or transferring the changes and you are bound by the user management restrictions.
- Only parameter changes which the logged in user is permitted to make are possible. Parameters which cannot be edited are displayed in the parameter lists in grey and marked with the  symbol, or in some cases will not be displayed depending on who is logged in.
- Select the parameter to be changed from the parameter tree. Activate the input field and press **[F1]** to get information about it.

## 8.3.1 Offline parameterization

There are two alternatives available:

- change an existing device parameterization
- create a new device parameterization



### Original content will be lost by changing

Do not use any parameter sets stored in the archive or as a backup to make changes. Instead, always read a new parameter set.

⇒ [Read-out parameterization](#) (p. 180)

⇒ [Saving, and exporting the parameter set](#) (p. 183)

### Requirements:

- The parameter file is opened and shown in the parameterization window.
- Restrictions of the user management and SSW position allow the transfer of the changed parameters

Offline parameterization takes place in the following steps:

Step	Content/Action
	Edit the device parameterization. ⇒ <a href="#">8.3.3 Editing parameterizations</a> (p. 233)
1.	If you are using a new parameter set or a product parameter set from other devices, please consider that this is only a template and that all the relevant parameters must be adjusted on the device before the parameter set is transferred to the device in step 3. <b>If you fail to do this, the device may react in an undesirable manner.</b>
2.	Save the device parameterization .
3.	Transfer the changed parameter set to the device with the matching serial number.

### Save offline parameterization



Only saved device parameterizations can be transferred, and only to the device with the matching serial number.

When all the required changes have been made, save the parameterization .

After it has been saved, the symbol  will turn gray and the lines will be displayed in black.

## Transfer offline parameterization

- 01 Establish the data connection to the appropriate device ⇔ [8.1.2 Data connection to the measuring device](#) (p. 174)
- 02 Make sure that there are no other enSuite connections to this device.
- 03 Highlight the desired **device parameterization** in the data structure of the **navigation window**
- 04 Select the **Transfer parameterization to device** action (for example in the context menu).
- 05 Log in using the login dialog with your user name and password which appears.  
The parameter set will be transferred.

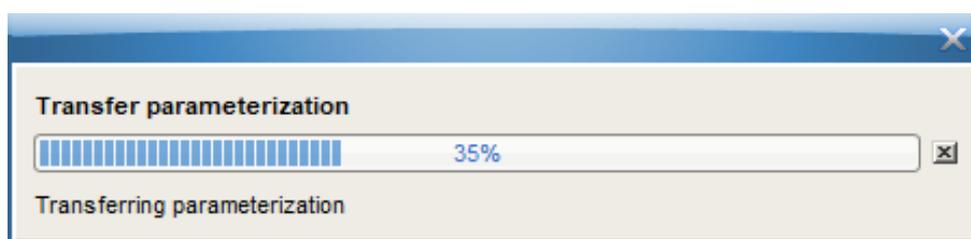


Fig. 8-42: Dialog transfer parameterization

There are typically a number of parameters which are protected by the security switch (SSW) (e.g. in order to meet the requirements of an approval).

If the new device parameterization is likely to bring about changes to such parameters, but the security switch is closed, then the message Device could not be parameterized appears following the transfer. The device does not restart; the old parameterization is still used.

If the parameters are not protected by the SSW or if this is open, the changes will be transferred, and the device will restart.

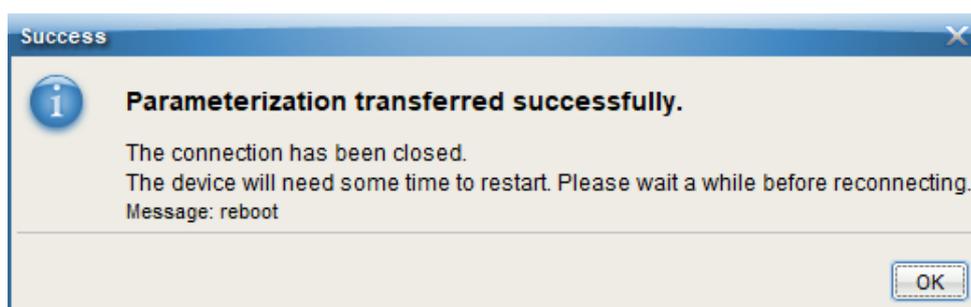


Fig. 8-43: Dialog parameterization transferred successfully

**The restart will disconnect the device and the user will be logged out automatically.**

The device will now operate using the transferred settings after you have re-enabled the required operating mode. These new settings will remain in use even after the device is switched off and on again.

### Possible errors

EnSuite marks incorrect parameter settings in color and the transmission into the device is prevented in most cases.

Nevertheless, parameterizations can cause situations which do not produce the desired result and are not indicated by error information. The following shows examples and remedial measures.

#### Dialog disappears without reaction

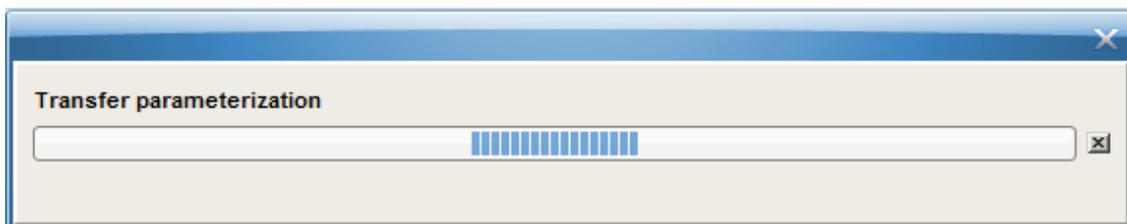


Fig. 8-44: Dialog Transfer parameterization

**Situation:** The dialog disappears without another message or confirmation. The device does not reboot.

**Cause:** The transmission path was interrupted or the transfer was too long.

**Action:** Check the transmission path (E.g., a slow W-LAN connection was selected)

Change the transmission path and retry the transmission (Use "wire"connection or use the USB port)



In order to ensure that a valide parameterization is in the device, read the parameterization again after a restart and compare this result with the saved version.

#### Files are not transferred

**Situation:** The following error message appears

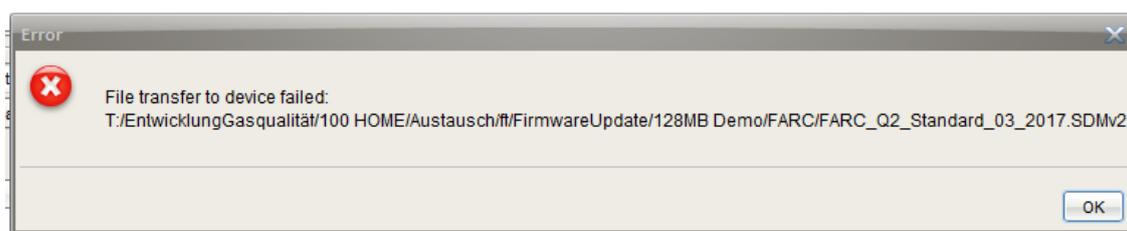


Fig. 8-45: Error data transfer

**Cause:** It is not possible to transfer files to a device (even parameter settings) If the file path contains umlauts (ä / ö / ü)

**Action:** Change the location of the data (e.g., copy data to the desktop)

## 8.3.2 Online parameterization

Online parameterization means that the content of certain parameters is changed directly during an existing data connection to the device. See → [8.1.2 Data connection to the measuring device](#) (p. 174).



No changes may be made to the AFB composition or the parameter structure.

Parameters labeled as  cannot be changed, parameters labeled as  may only be changed provided the fiscal audit trail is not full, if the security switch is closed

Non-editable parameters are listed in gray in the parameter lists and are labeled with the symbol .

### Changing device parameters in the connected device online

1. Establish the data connection to the device
2. Select the entry **Online parameterization** in the lower section of the navigation window.
3. Log in with your user name and password using the login dialog that appears.
4. The parameterization is read; the parameterization window then opens up for editing purposes. (The elements of the parameter tree will be displayed in black.)
5. Make the changes → [8.3.3 Editing parameterizations](#) (p. 233)

After entering the edited value, the edited parts of the parameter tree will be highlighted in green. This indicates that the parameter was edited but the change has not yet been transferred to the device. Any super-ordinate branches are also green at the same time.

6. Activate the Transfer parameterization to device button .

Once the transfer is completed, the parameter label is then blue. This indicates that the transfer was completed but the edited parameterization has not yet been saved in enSuite.

7. Save the changed parameter set in enSuite. Use the diskette symbol .  
(Once they have been saved, the values will again be displayed in black.)
8. Log out by closing the online parameterization window.

### 8.3.3 Editing parameterizations

The parameter set also called parameterization is changed or edited in the **parameterization window**. In the **parameters tab**, the parameters of the individual parameter branches are listed in table format and offered for editing.



Use **virtual login** to make editing safer, simpler and hide unnecessary parameters. ⇨ [Virtual login \(restriction of editing options\)](#) (p. 215)

The function blocks of the enCore software provide results (**Exports**) which can be further processed by other function blocks as an **import value**. In the **value window** the exports are identified by a symbol. This symbol shows at a glance to which physical quantity the value belongs.

In the help window of enSuite **online help** you will find the folder **GUI at glance** located under **About enSuite**. In this folder the subfolders and branches all essential information can be found.



During editing, the program makes use of color-based signs in order to identify the status. If the parameter label is blue, this means that the parameter was edited but the change has not yet been saved. Any superordinate branches are also blue at the same time. A red parameter label indicates that changes have been made and the parameterization is not yet valid. The parameterization can be saved, but it cannot be transferred to a device.

Additional practical tips for editing parameterization:

- If you delete or make a major change to a value and the value is used in a different context, all the links to this value will be invalidated and will be automatically deleted. You will receive a message about this process so that it is obvious which links must be recreated.
- New functions or changed operating modes require additional parameters which are then made available for editing in a new subordinate branch. Example: Converting the operating mode of a board channel, e.g. for changing from “**not used**” to “**message input**”.
- For certain parameters, it is also possible to select the option. Select always an option **Not used**, e.g. for unavailable input values.
- Parameterization of input channels  
Parameterize the measurement devices that are connected to the digital channels. The operating mode typically needs to be selected initially for the respective channel under **Basic System – I/O – <Board name> – <Channel name>**. The associated parameters can then be edited.

- Define protocol channels

The CPU and or certain process boards provide digital protocol channels. These are intended for the connection of measurement devices via digital protocol or for communication via Modbus (in conjunction with the Modbus AFB). Only the basic communication parameters are specified when defining a protocol channel. You can then edit the associated parameters. Define protocol channels

- define Pre-processing operations

in the **Postprocessing AFB**. Create messages or implement a strategy e.g.in the event of errors and/or for fixed substitute values. Change units ⇔ [Change default units](#) (p. 195) if necessary

- Assign the desired export value

to each required input value of the **AFB** or **SFB**. This export value is typically provided by another SFB or AFB. You must take care to ensure that the source of the value is correct. The assignment of an export value to an import parameter only works if the physical quantity is matching. A stop sign  appears if any such assignment is not possible (e.g. because the physical quantity is not matching).

- Check or edit all options and constants. For certain constants, such usage can also be switched off via the context menu by choosing **Not used**.

## 8.4 Change settings of the Q2 AFB

The following section explains in combination with the **online help** how to adjust some settings in the **Q2 AFB**. An overview is given in the online help. Select **Q2** in the parameter tree of the **parameterization window** and press **[F1]**.

### 8.4.1 Setting or changing automatic measurements

To ensure the accuracy of measurement, the measuring instrument is continuously checked and corrected during operation. This is ensured, among other things, by automatic operational calibration once a week and is shown on the display in the top line.



With the factory parametrization and the commissioning settings, the operational calibration runs automatically without any additional intervention.

Prerequisite for the automatic calibration, which takes a few minutes, is that the operational calibration gas (mixture of methane + CO<sub>2</sub>) is permanently connected to Q2 and is at the correct pressure. The calibration starts with the purging time for this gas mixture, which ensures that the unit is filled exclusively with this gas. When calibration is complete, the measuring unit is purged with process gas and then automatically continues the analysis.



#### ATTENTION

##### Data for automatic measurements and processes not up-to-date

Measurement results can be falsified

During commissioning, the purge times, the gas compositions of the calibration gas and, if necessary, the calibration cycle must be adjusted

After reading out the current parameterization, you will find the present settings for operational calibration under the path shown in the picture. This covers the majority of applications. Nevertheless, it may be necessary to adjust some parameters. These changes are easier to carry out when using enSuite than on site at the device.

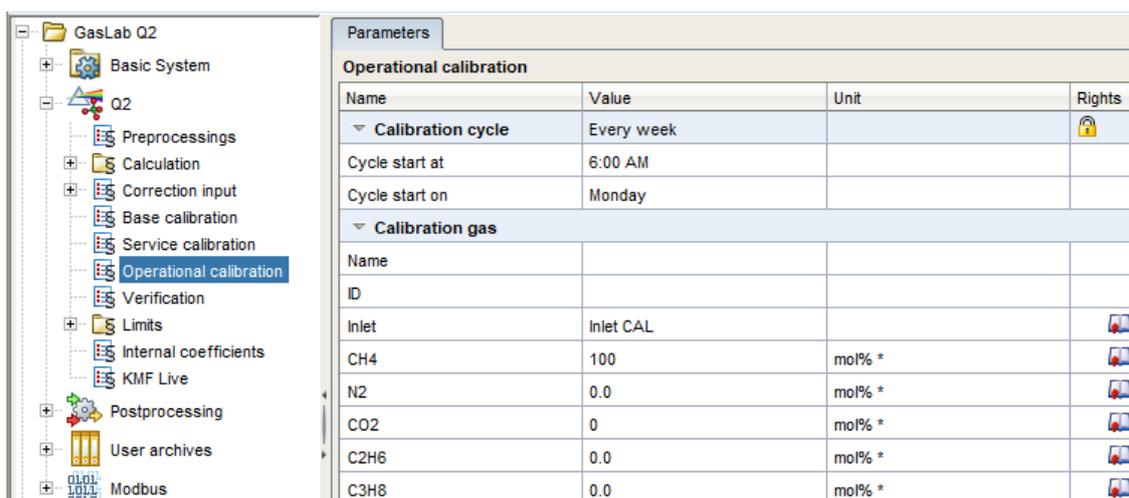


Fig. 8-46: Operating Calibration Gas Settings

For example, the exact composition of the calibration gas mixture according to the manufacturer's certificate of analysis must be checked with enSuite or on the instrument and changed if necessary, as shown in the picture above. The preset flushing times must also be adapted to the local conditions.

Change the settings using the instructions in the **enSuite online help** and in section ⇨ [7.4.2 Operating mode: Operational calibration \(manual\)](#) (p. 162). The device also offers further possibilities to modify the automatic operating calibration, e.g. changing the day of the week and time of calibration. Proceed according to the instructions in the **enSuite online help**.



Changing the time-controlled trigger (interval, day, time) makes sense, for example, if there are two measurement devices since otherwise both devices would be calibrated at the same time and it would not be possible to access either of the two measurements during this time.

An automatic operational calibration may also make sense after certain events and, for example, be triggered when input signals are received or after a restart.

If the calibration fails, the situations and procedures specified in section ⇨ [7.4.2 Operating mode: Operational calibration \(manual\)](#) (p. 162) also apply.

**The automatic verification** (test gas measurement) can be used for instrument control. Similar to the operating calibration described above, the settings in the following enSuite path must be adjusted:

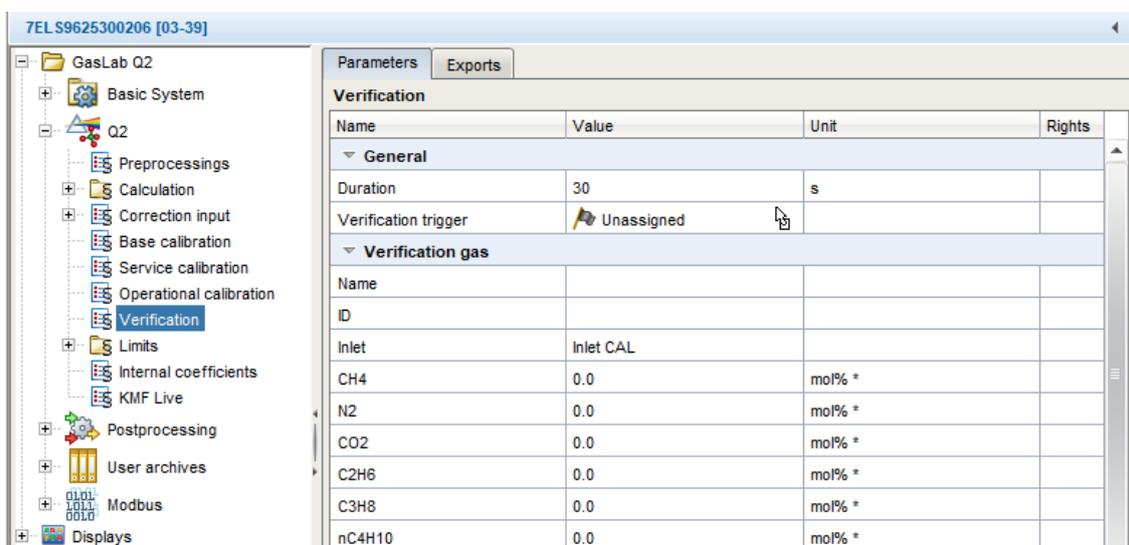


Fig. 8-47: Automatic Verification Settings

**In addition, an automated 3-way valve must be installed in the gas flow .**

Furthermore, the prerequisites and instructions explained in section [7.4.3 Operating mode: Verification \(special mode\)](#) (p. 165) apply.



The annual **service calibration** usually not automated requires an additional different gas mixture [10.3.11 Completing a service calibration](#) (p. 270).  
(setting analogous to the above examples in the parameter Service calibration)

## 8.5 Using enSuite functions and other AFBs

In normal operation, the device will operate autonomously. Nevertheless, there are situations which require contact to be established with the device. This may be the case, for example, if you wish to view or check the results live or export and archive data from the device memory before they are overwritten. The use of other AFBs is also a reason to get in contact with the device.

### 8.5.1 Working with archives and logs



Individual archives can be created via the parameterization in the AFB User archive. Further information see ⇒ [enSuite online help \(p. 173\)](#)

Three archives, used as logs, are always available, “**Audit trail (system)**”, “**Audit trail (fiscal)**” and “**Logbook**”. Whenever changes occur or events come and go, this information is written into one of them and stored as a history. The archives takes the form of a ring buffer with 1000 data records.

- The header contains a timestamp with the precise calendar time at which the entry was generated and an ascending ordinal (sequence) number for the log entry.
- The text body contains the text with information about the reason the entry was generated. This text depends on the cause and the settings in enSuite. It starts with the name of the SFB/AFB which caused the entry.

#### The Logbook

documents / saves events and protocol the device operation in this way. All the relevant data, like logins, logouts and password changes, new set of parameters, can be viewed in these archives. The archive content remains available in the event of a power failure or software update. When the logbook is full, the next entry will overwrite the oldest data record. The user cannot delete the entries.

#### The Audit trail

This protocol archive is part of the basic system and exists in all enCore device types. All the data in the audit trail is also saved in the log which means that the entire recorded history is visible in the latter. A distinction is made between “System /General” and “Fiscal”. The Fiscal audit trail is primarily relevant for billing purposes. The terms “**official**”, “**fiscal**” and “**legal metrology**” are used synonymously.



In the General section, the oldest entry will be overwritten.

The fiscal audit trail is only filled if the SSW is closed and an approval file is used which provides for the filling. After 1000 entries, no changes can be made to the legally relevant parameters unless the security switch (SSW) is open.

The archives can only be cleared / deleted if the user has the appropriate rights and the SSW is open.

The data can be read out, viewed, saved, backed up and exported using enSuite.



#### NOTICE / AVIS

##### Data will be overwritten Les données seront écrasées

The operator must read the data and save it to external data media at suitable intervals. Only if this is done it will be possible to access the information in the logbooks if the data have been deleted or overwritten on the device. The archive can only be cleared / deleted if the user has the appropriate rights and the SSW is open.

L'opérateur doit lire les données et les enregistrer sur un support de données externe à des intervalles appropriés. Ce n'est qu'ainsi qu'il sera possible d'accéder aux informations des journaux de bord si les données ont été effacées ou écrasées sur l'appareil. Il n'est possible de vider ou de supprimer l'archive que si l'on dispose des droits correspondants et que l'interrupteur d'étalonnage est ouvert.

### Readout archives in enSuite

Prerequisite(s)

- A data connection to the device exists.

01 Select your device in the navigation window.

02 From the context menu select the action: [Readout archives](#)

03 Save the archives with a suitable name.

⇒ enCore manual “Configuring the Device with enSuite“

### Archives after reading out

The archive will be saved in the path Devices – <Serial number/Name> – Archives or Archive reading cycles. See example:

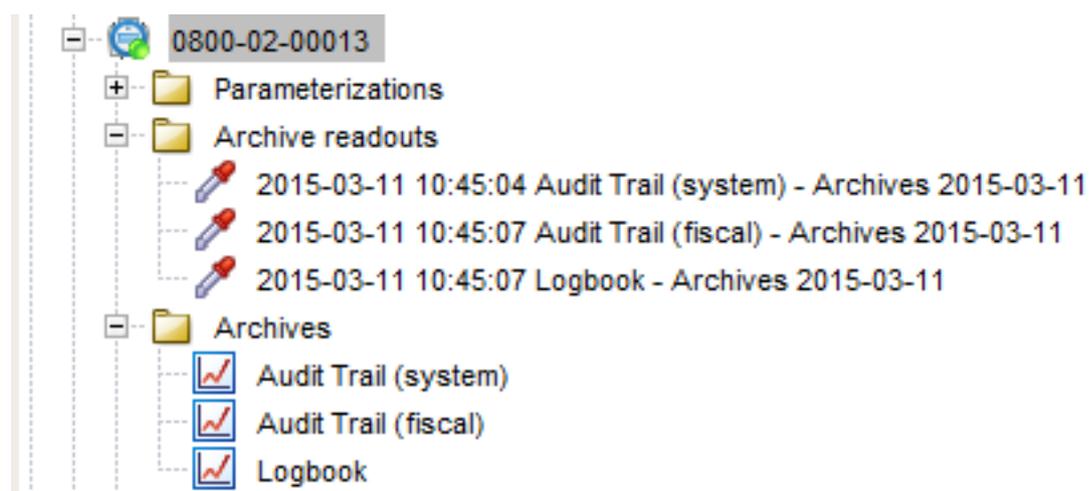


Fig. 8-48: Archives after reading out

Each time enSuite reads data, a reading cycle is generated – displaying exactly what was read – sorted by ordinal number. Then ⇒ [Disconnecting the device](#) (p. 179) if needed and view the data in a table.

To do this, select the archive, for example **Logbook**, and click on **Display archive** in the bottom section of the navigation window.

The archive window appears and shows the content of the selected archive in tabular and, possibly, graphic form. The ordinal number and the archive time are displayed on the left. The archived data is shown in the remainder of the line.

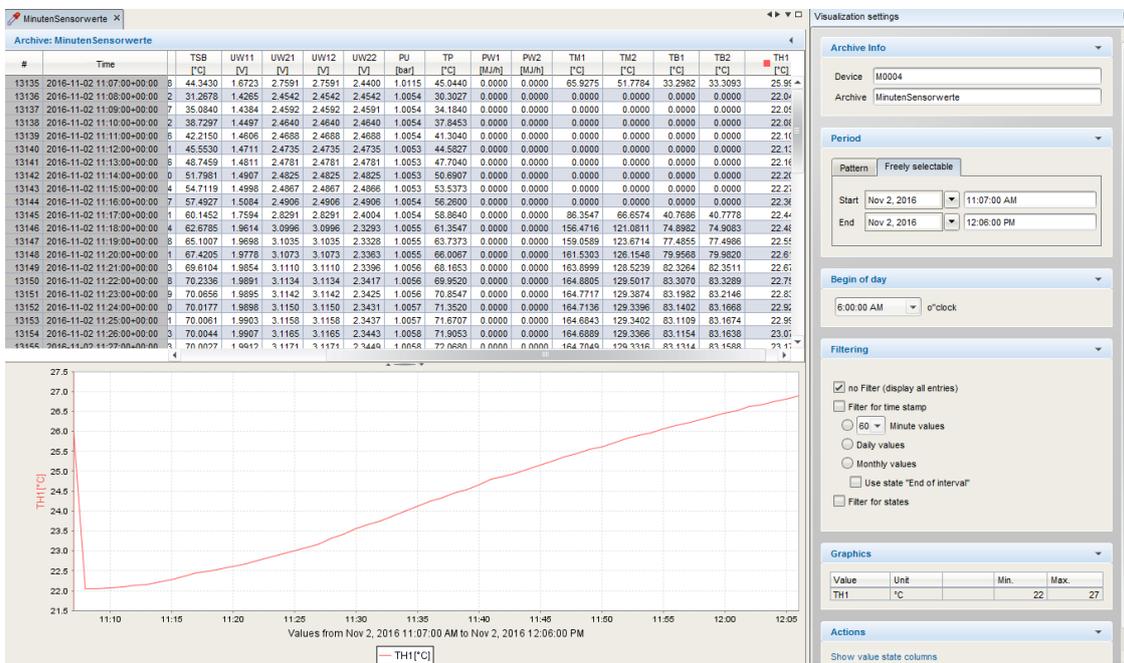


Fig. 8-49: enSuite Archive Window)

Use the “**scroll bar**” (if displayed) to view more archive entries. Depending on the type of data, a visualization window may also appear under the table. You can view selected data in graphic form in this window. The selection is made in the context menu by clicking on the header.

There is a clear link between the date and ordinal number; each entry has a time stamp.

Some events are abbreviated by letters and numbers. The letters stand for:

W = Warning A = Alarm H = Note

The numbers stand for:

0 = Message not present 1 = Message present 2 = Signal changed

#	Time	Data
17	2019-06-10 08:56:20+03:00	Q2.HSV.Substitute values used, W, 0
18	2019-06-10 09:12:10+03:00	Q2.General events.Service calibration, H, 1
19	2019-06-10 09:47:03+03:00	Q2.General events.Service calibration, H, 0
20	2019-06-10 10:13:48+03:00	Q2.General events.Operational calibration, H, 1
21	2019-06-10 10:22:29+03:00	Q2.General events.Calibration successful, H, 2
22	2019-06-10 10:23:32+03:00	Q2.General events.Operational calibration, n, 0
23	2019-06-10 10:40:55+03:00	Q2.General events.Verification, H, 1
24	2019-06-10 11:30:11+03:00	Q2.General events.Operational calibration, H, 1
25	2019-06-10 11:30:11+03:00	Q2.General events.Verification, H, 0
26	2019-06-10 11:30:16+03:00	Q2.Error events.Calibration gas pressure alert, A, 1

Fig. 8-50: Example Abbreviations

In the example (see marking) GasLab Q2 signals a successful calibration.

A window with settings for the visualization appears on the right-hand side. You can filter the display here and decide how the archive channels should be displayed. Once again, you can use the optional displayed **scroll bar** to view all the options.

Using the same process as for parameterization, you can also export selected files using the symbols or the export function in the context menu to make yourself independent of your current enSuite installation.



Fig. 8-51: enSuite export functions



Further information on "**General audit trail**" and "**fiscal audit trail**" is available in the online help. Open the parameterization branch **<System>**. Press **[ F1 ]** on the **Parameters Audit trail** area.

## 8.5.2 Displaying and reading analysis results

The analysis results can be displayed and read in different ways.

The Modbus AFB can be used to export and process the data. You can also use the User archives AFB to save the results in the device. These data can be read out and viewed or saved later to a PC.

The enSuite function “**Live data and trending**” can be used to analyze individual results in more detail and display them in graphic form.

## 8.5.3 Working with the Modbus AFB

The Modbus AFB allows the Modbus parameters to be configured. It is used if TCP/IP has not been configured for data transfer or data exchange.

An example of the application is a new data flag, which can be formed with the help of an export value (signal “New data available”) and thus transmits via Modbus the presence of new data. Modbus resets this counter either with a result request or as soon as a timer has expired. This state remains until a new signal increments the value again. The online help contains more information about this example.

Modbus settings can be freely selected within wide ranges. This enables you to adjust the device perfectly to the environment of your measuring equipment using standard parameter sets or to use the device as a replacement without changing the existing structure.



### NOTICE

**Consider country-specific regulations! Envisagez des réglementations spécifiques à chaque pays !**

Please note that Modbus communication is not encrypted. This does not prevent an attacker from intercepting or modifying the communication. Consider the country-specific regulations. These may require manual verification of the data. Veuillez noter que la communication Modbus n'est pas cryptée. Cela n'empêche pas un attaquant d'intercepter ou de modifier la communication. Tenez compte des réglementations spécifiques à chaque pays. Celles-ci peuvent nécessiter une vérification manuelle des données.



**The Modbus AFB has its own operating instructions which can be downloaded from the Docuthek [www.docuthek.com](http://www.docuthek.com)**

Please note that Modbus mainly transmits numbers. For example, the operating mode and the operating step of the device are indicated as export values, by (Modbus numbers), since the plain text is not output here.

## 8.6 The Remote operation panel actions

The so-called remote operation panel refers to a function that enables the remote control of enCore devices with your service computer. The remote operation panel is a copy of the local operation panel and is displayed in enSuite. The remote access can be done via Ethernet or USB connection.

Because the remote operation panel behaves like a real display on most enCore devices, opening, closing, or connecting / disconnecting the instrument does not change the login status.

### 8.6.1 Activate / deactivate remote operation panel

As soon as you are connected to a device (see ⇒ [Connect enCore device to Service PC](#) (p. 175)), the entries in the lower left corner of the enSuite interface are activated. If you select the entry "**Remote operation panel**" there, a graphical control panel appears in the middle of the enSuite interface. The shown display corresponds to the front of the device.

By mouse clicks in the areas of the 7 touch fields (see ⇒ [7.2 Screen display on the operation panel](#) (p. 105), the same operation as on the device is possible. The displays of the screen and the LEDs are now synchronous to the device. At the same time, the physical local display is assigned a lock screen and the local input is deactivated.

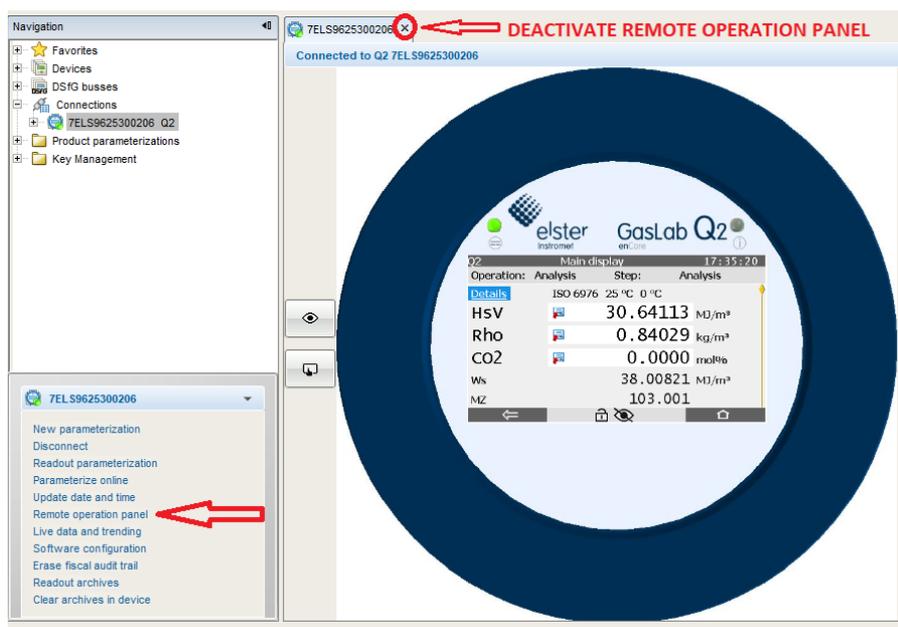


Fig. 8-52: View of the remote operation panel via enSuite



**Tip:** Detach the window from the enSuite frame see ⇒ [Starting enSuite](#) (p. 171) and have the remote operation panel displayed enlarged, which makes it easier to use.

#### Deactivating the panel function

by closing the window with the **X** in the first line (shown in the figure above), by disconnecting the device ⇨ [Disconnecting the device](#) (p. 179) or automatically after a few minutes without activity.

After deactivation, physical displays and local entries are reactivated. Also on the device, a local user can cancel remote access at any time.



If a user uses the remote operation panel, it cannot be opened by another user. If the remote operation panel is closed, it can be used in another enSuite connection.

## 8.6.2 Enabling the local device functions

The local display can be enabled, and the operation of the device can also be granted. This is useful, for example, if technical support is to be remotely located and you need to see the device display on the device at the same time. For this purpose, there are two toggle buttons to the left of the illustration of the device front that switch between the following positions each time they are pressed. See the following tables.

### With the upper toggle button enable or disable the device display for a local user

Current status:



The local user sees a lock screen and the device cannot be operated locally.

Action: Click to activate the device display. If desired, you can now activate local operation on the device with the lower toggle button.

Current status:



The local user sees same what is shown on the remote operating panel.

Action: Click to lock the device display for the local user, a lock screen is displayed instead. Any local control granted is also removed. No user interaction is possible on the device.

### With the second toggle button give the local user control of the operation -this button is only active when the local device display is enabled:

Current status:



The local user cannot operate the device.

Action: With a click on the button, the local user gets the possibility to operate the device.

Current status:



The local user can operate the device.

Action: Click to deny the local user access to the device.

The selected setting is also indicated by symbols in the middle of the footer or status line of the displays:



The local user sees the lock screen



The local user sees actual display content and can operate the device.



The local user sees actual display content, but the device is operated from remote.



If the local user is granted the view, the remote keyboard input is visible to the local user on the device display!

Note that your input via the remote operation pane can be observed on the device display!

Therefore, before entering sensitive data, such as your user password, undo the view by pressing the corresponding toggle button again.

As soon as a local user on the device opens the virtual keyboard for input with granted control, enSuite displays a lock screen:

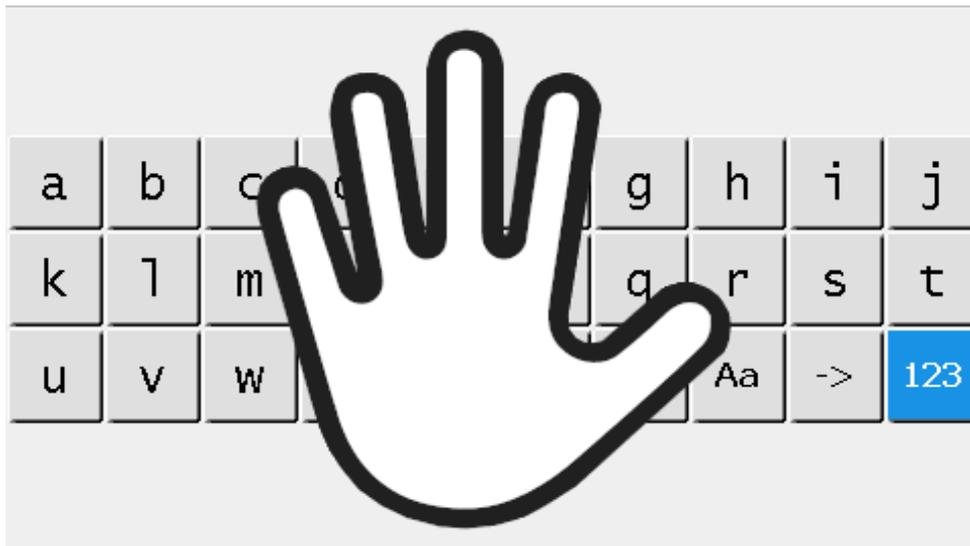


Fig. 8-53: Lock screen on remote operating panel during local keyboard entry



**Local keyboard entries are never visible on the remote operation panel for data protection reasons**

## 9 Possible malfunctions and troubleshooting



### PROHIBITION INTERDICTION

Carry out any of the work mentioned in this section if you do not have.  
*D'effectuer l'un des travaux mentionnés dans cette section si vous n'avez pas.*

- the necessary instructions from the manufacturer or his authorized representatives  
*les instructions nécessaires du fabricant ou de ses représentants autorisés*
- the permission of the plant operator  
*l'autorisation de l'exploitant de l'installation*

### 9.1 Possible error events

These are messages 🚩 or signals 📡 that are generated by different software parts (called AFB or SFB). All events are binary. They may or may not exist at a certain point in time. All possible display texts are listed under the respective AFBs or SFBs in the export value window of enSuite ⇨ [8 Configuration and analysis software enSuite](#) (p. 169). Alarms are shown in red 🚩🚩 and warnings in yellow 🚩📡.



In the **export value window**, select a message or a signal e. g. currently displayed in the **Error List**. Press **F1** to get information about the event or further actions. Additional display texts can be generated. This is done in the **Postprocessing AFB** by changing the parameter set. Further information on parameterization and on the Postprocessing AFB see ⇨ [8.3 Notices about parameterization](#) (p. 228)

## 9.2 Disturbances during normal operation (troubleshooting)

On the operation panel, in addition to the screen and the keys, there are two multicolored LEDs. On the basis of the display (color / flashing light), you can see whether the measuring device is working properly or whether there is or was a malfunction.

In this case, the fault list contains corresponding entries. As an aid to eliminating malfunctions, this section contains guidelines for troubleshooting. You can locate the cause of these malfunctions by checking the input and sensor values and, if necessary, correct them. Honeywell provides troubleshooting assistance.

### Troubleshooting checklist

- 01 Check that the process gas and calibration gas are available at the correct pressure
- 02 Check that the vent gas line is not blocked.
- 03 Check the gas flow in the device (e.g. float / flow meter)
- 04 Check the supply voltage(24 VDC) and the housing grounding as well as the boot-loader
- 05 Check the communication connections
- 06 Check the displays for red entries.

The following describes action to prevent some errors. It is essential to obey all the safety regulations when troubleshooting, particularly the following:



#### NOTICE

Opening of the device only with written operator's authorization under observance of all safety measures!

Do not loosen cable entries in an explosive atmosphere!

Loosening or unscrewing the breather element is prohibited!

Only explosion-protected, approved work equipment is to be used!

Work only in de-energized and depressurized condition, no explosive gas atmosphere may be present!

Protect all open lines and connections against contamination / dirt!

Before the device is switched on again, ensure that all the gas connections are sealed and the grounding or PE wire is correctly installed.

**AVIS**

*Ouverture de l'appareil uniquement avec l'autorisation écrite de l'exploitant en respectant toutes les mesures de sécurité !*

Ne pas desserrer les entrées de câbles dans une atmosphère explosive !

Il est interdit de desserrer ou de dévisser l'élément de mise à l'air libre !

Utiliser uniquement des équipements de travail homologués et protégés contre les explosions !

Ne travailler qu'à l'état hors tension et dépressurisé, aucune atmosphère gazeuse explosive ne doit être présente !

Protéger toutes les conduites et tous les raccords ouverts contre la contamination / la saleté !

Avant de remettre l'appareil en marche, s'assurer que tous les raccords de gaz sont étanches et que le fil de mise à la terre ou PE est correctement installé.

If you are not successful with the following methods, there is a defect which you can only rectify by replacing modules. Contact Honeywell to obtain the required parts or to arrange a service visit. ⇨ [12.1 Technical support Flow Computers and Gas analyzers](#) (p. 290).

## 9.3 Correct the gas supply failures

Rectification of the errors under points 1 – 3 (gas supply error) e.g. abnormal loss of calibration gas. The following measures can be taken:



**DANGER due to unusable gas leak detector**

***DANGER dû à un détecteur de fuite de gaz inutilisable***

**Damage to health and property (explosion) possible**

***Dommages pour la santé et les biens (explosion) possibles***

Use gas leak detectors that reliably indicate even the smallest leaking quantities of the gases used.

*Utilisez des détecteurs de fuites de gaz qui indiquent de manière fiable même les plus petites quantités de fuite des gaz utilisés.*

### Steps

01 Complete a tightness test ⇨ [10.3.3 Check the tightness of the installation](#) (p. 261)

02 Set the regulators and valves to the required values..

03 Disconnect blocked lines from the switched-off device and flush the pipeline with non-flammable gas to remove any blockages and deposits not exceeding the maximum pressure.

04 Discharge the purge gas properly

### 9.3.1 Pressure alarm analysis

For a valid measurement the internal pressure in the sensor block PI must be 0.15 bar  $\pm$ 0.015 bar higher than the ambient pressure PU. If the internal pressure differs too much, **the right LED starts flashing**. The error list contains PI lower alarm limit or PI upper alarm limit. This may be due to the following reasons:

- During commissioning, there may be a faulty transmission of the pressure sensor or an invalid setting of the pressure controller. Both components are located on the sensor block. First  $\Rightarrow$  [9.3.2 Check pressure sensor \(function\)](#) (p. 249) to locate the error.
- After a long period of operation, blockages can be the cause, recognizable e.g. by an reduced flow. Inform Honeywell.

### 9.3.2 Check pressure sensor (function)

Prerequisite(s)

- The device is switched on. Analysis mode (operation and step) is executed.
- Permissible inlet pressure at the PG inlet.
- Status LED flashes red
- Values PI (pressure in sensor block) and PU (ambient pressure) can be read.  
 $\Rightarrow$  [7.3.10 Display Q2 sensor values](#) (p. 143)

Steps

- 01 Make sure the ball of the right flowmeter is floating.
- 02 Note the value PI with gas supply on. See example.

Q2		Sensor values		13:36:42
Operation:	Analysis	Step:	Analysis	
UIR1			315.12 mV	
UIR2			874.42 mV	
UIR3			608.60 mV	
UIR4			490.15 mV	
PI	Internal pressure with gas		1.1451 bar	
TSB			70.00 °C	

Fig. 9-1: Sensor block internal pressure working device

- 03 Shut off the gas supply at the device inlet.
- 04 Wait until the inlet pressure has released.  
(The ball of the right flow meter is no longer floating)

05 Note the PI and the PU value without gas supply. See example.

Q2 Sensor values 13:03:28			Q2 Sensor values 13:02:02		
Operation:	Analysis	Step:	Analysis	Operation:	Analysis
UIR1			439.05 mV	TSB	70.00 °C
UIR2			1229.25 mV	UW11	1629.78 mV
UIR3			605.19 mV	UW21	2611.59 mV
UIR4			495.51 mV	UW12	1175.22 mV
PI	Internal pressure without gas		1.0157 bar	UW22	1971.07 mV
TSB			70.00 °C	PU	Ambient pressure 1.0125 bar

Fig. 9-2: Sensor block values without gas (ambient pressure)

#### Results which need a replace of the sensor block:

- The noted PI values step 2 and step 5 are the same (no sensor reaction).
- PI and PU value from step 5 are very different, more as the example shows.
- PI or PU from step 5 corresponds not approximately to the ambient pressure.

#### Results which need a check for bad contact

- PI value from step 2 is greater than the value from step 5. (The sensor reacts, but the internal pressure is faulty)
- PI and PU from step 5 are approximately the same and correspond approximately to the ambient pressure.

Inform ⇒ [12.1 Technical support Flow Computers and Gas analyzers \(p. 290\)](#)

## 9.4 Correct electrical faults

Rectification of the errors under point 4 (electrical supply and insulation errors, no enSuite connection possible).

If the device is not supplied with electricity or the supply voltage / current is too low, the following effects may occur:

- The interactive screen is dark, the Status LEDs are off.
- The interactive screen is dark, the right Status LED flashes or is off.

Prerequisite(s)

- All all switchgear and fuses outside the device have been checked and are OK. Defective parts were replaced if necessary.
- The idling voltage (without connections) and supply voltage (with connected device) of the electrical supply has been checked and is OK (24V DC). Defective parts were replaced if necessary.
- Opening of the device is permitted by the plant operator.

**Following tools and materials are available:**

- Multimeter
- Service standard tools
- Some small cable ties
- Gas leak detector for flammable gases, calibrated with status or value display
- ESD wrist strap or similar device to prevent electrostatic discharge

### Steps

**Preparations for opening and opening the device:**

- 01 Dee-energize the device (switch off power).
- 02 Make sure that there is no voltage, e.g. with a multimeter.
- 03 Turn off gas supply, block the device from all gases.
- 04 Monitor the environment for the presence of an explosive atmosphere, e.g., with a gas leak detector, continuously during the entire process.
- 05 Ensure there is no explosive atmosphere. Only then open the device.  
⇨ [5.5.1 Opening GasLab Q2](#) (p. 70)



**DANGER EXPLOSIVE ATMOSPHERE / HOT SURFACES**

**Damage to health and property (explosion) possible**

Stop work immediately if an explosive atmosphere occurs!

The sensor block is heated up to 70 °C!

Let it cool down, be careful not to burn yourself.

**DANGER ATMOSPHÈRE EXPLOSIVE / SURFACES CHAUDES****Possibilité d'atteinte à la santé et aux biens (explosion)**

Arrêtez immédiatement le travail en cas d'atmosphère explosive !

Le bloc capteur est chauffé jusqu' à 70°C  $\cong$ 158°F !

Laissez-le refroidir, en veillant à ne pas vous brûler.

**Examine the device.**

- 01 Avoid electrostatic discharges, e.g. with an ESD wrist strap.
- 02 Disconnect the supply line connector from the circuit board.
- 03 Measure the electrical resistance of the cable connection between the device plug and the electrical supply. If there is no low-resistance electrical contact, reconnect the wires. If the contacts are OK, go to the next step.
- 04 Ensure there is still no explosive atmosphere. Only then switch power to the device and measure the incoming idling voltage of the supply cable at the removed plug.
- 05 Replace the cable (**power off before**) if the voltage is missing or significantly lower than the voltage of the electrical supply. If the power supply is OK, go to the next step.
- 06 **With power off**, plug the supply line connector back onto the circuit board.
- 07 Ensure there is still no explosive atmosphere. Only then switch power to the device and check if the error is still there. If so, contact Honeywell

**Device closing**

- 01 De-energize the device (switch off power).
- 02 Make sure that there is no voltage, e.g. with a multimeter.
- 03 Close the de-energized device.  $\Leftrightarrow$  [5.5.2 Closing the housing of Gaslab Q2](#) (p. 72)
- 04 After successful repair, supply the device with power again, to complete the work.

## 9.5 Correct communication errors

Rectification of the errors under point 8 (communication error)

The following action can be taken if an error occurs in the data communication. This may be a hardware error or a software error.



Always use the latest enSuite version for your work to access all device versions. ⇨ [8.1.4 Update Downgrade and Bugfix-Software](#) (p. 186)

### Action: Checking the communication (software)

- If changes have been made to the parameterization, undo them. Use the last saved functional parameterization. A complete check of the current device configuration can be performed with the enSuite software with an online connection.
- If the bus communication is not working, it may be the case that the device has been parameterized to too high an operating mode. If you have multiple devices on the bus, you must take the slowest subscriber into account when selecting the operating mode.
- Use the test function of the digital inputs and outputs

Requirements:

In- and outputs being tested are parametrized, the device is switched on and ready for operation. You are logged in with the required rights. Navigate to the **I/O overview display**. Select **On** for the test mode of the appropriate hyperlink. Click on the hyperlink to go to the Board details sub-display. Select the communication you wish to test under **Channel** in Board details. See figure.

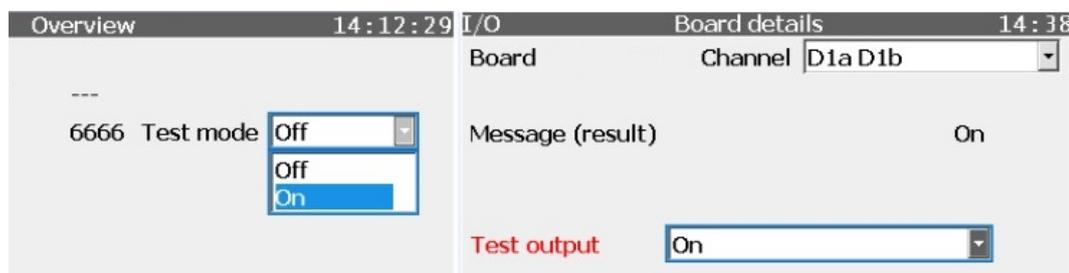


Fig. 9-3: Example I/O overview and Board details displays

The desired state is shown next to **Message (result)**. In the example, **On**.

You can change the states, regardless of the actual conditions, using **Test output**. Measure each output in both states (On/Off) to obtain a complete overview of the error situation. Use a measurement device to test whether a connection exists, will be created or has been interrupted between the switch signal cable and the return cable.

**Do not forget to switch off test mode again.**

**Action: Checking the communication (hardware)****NOTICE AVIS**

Carry out the following hardware check only in consideration of explosion protection, required housing opening may only take place if no explosive atmosphere is present.

*Effectuez le contrôle matériel suivant uniquement en tenant compte de la protection contre les explosions, l'ouverture requise du boîtier ne peut avoir lieu que si aucune atmosphère explosive n'est présente.*

⇒ [5.5 Opening and closing GasLab Q2](#) (p. 70)

- Check the communication cables for signs of damage. Check the “terminal to terminal” connection for each core.
- Checking the digital communication (Modbus etc.) can take place (e.g. as protocol analyzer). Use appropriate tools.
- Parameterized output signals can be measured with appropriate measuring instruments and checked in this way.
- Test the function of the digital outputs after switching off the device. The plugs of communication cables have been disconnected in the connection box . Use a measurement device to test whether there is a connection between the switch signal terminals and the return cable. Except for output DO\_1, the normally closed contact, no connections are permitted to be made.

Also note the information in section ⇒ [5.6.6 Connection to other devices and system parts](#) (p. 83) to get a better overview.

## 9.6 Resolving a "Protocol error" (message)

### Background

Masters (serial) or clients (TCP/IP) monitor the communication via Modbus. They establish a transmission error if either the Modbus communication is interrupted or the data import or data export is not successful for at least one register. In this case, the AFB generates a message with the same name  **Protocol error**. The message is displayed until all registers of this Modbus unit can be successfully imported or exported again.

Important parameters for error recognition include **Transaction timeout** (master) and **Error filter** (slave/server). In the case of **Transaction timeout** you determine a maximum time period for which a master waits for the answer from a slave before it generates a protocol error. In the case of the error filter, you specify for each slave/server the number of times the AFB tries to export or import a register (Round Robin method) before the master or client generates the message.

### Possible causes and remedies

- The device is switched on, but is not reachable due to erroneous parameterization of the communication parameters.
- Ensure that the communication parameters in the  **Basic System** and  Modbus AFB are coordinated between the master and slave and/or client and server.

OR

#### [only Slave/Server]

- The error tolerance during data import or data export of a register is too low.
- On a test basis, increase the **Error filter** parameter under:  
 **Modbus** –  **Communication mode: Master or client** –  **Remote devices** –   
<Remote device x>, tab **Parameter**, section **General**.

OR

#### [Master and slave]

- At least one register is incorrectly or not at all parameterized on one of the two sides.
- Use the operation panel of the enCore device in the display belonging to the  Modbus AFB and check which registers are not regularly refreshed. On both sides, check for errors in the respective parameterization concerning these register numbers.

OR

#### [Master and slave]

- The cabling is defective or there is a cable breakage.
- Check the cabling and replace the damaged cable.

OR

#### [only master]

- The remote device (slave or server) processes the telegrams slower than expected.
- On a test basis, increase the **Transaction timeout** of the master under:  
 **Modbus** –  **Communication mode: Master or client**, tab **Parameter**, section **Interface**

## 9.7 Sensor errors

Sensor errors, usually recognizable by the values displayed in red on [⇨ 7.3.10 Display Q2 sensor values](#) (p. 143), can only be corrected by replacing the sensor block.



Inform Honeywell [⇨ 12.1 Technical support Flow Computers and Gas analyzers](#) (p. 290)

## 9.8 Eliminate start-up errors

### Prerequisite:

A prohibition sign is shown on the display or in the **remote operation panel** the device is in emergency operation. Hints about the **remote operation panel** ⇨ [8.6 The Remote operation panel actions](#) (p. 243) a connection to the device is required.

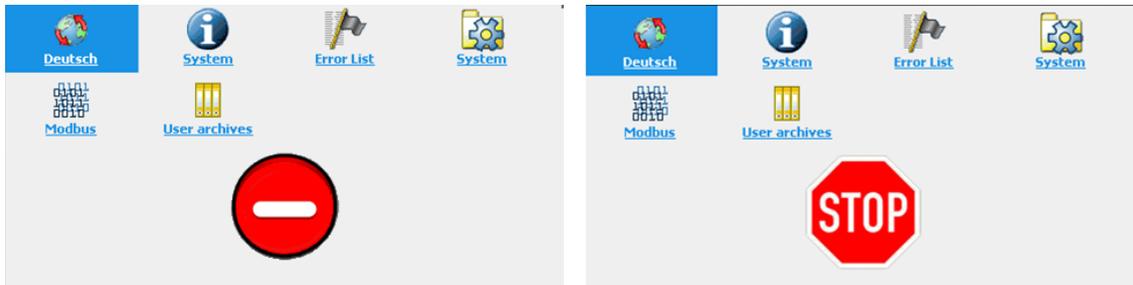


Fig. 9-4: Device not ready

### Background

Examples of such errors are import of a faulty parameterization or internal connection errors. For example, after or during start-up, a one-way sign is displayed, and only the basic functions for error handling are active; all other functions are deactivated.

### Procedure in case of errors caused by parameterization

- Transfer a correct parameterization to the device, e.g. the factory parameterization.  
⇨ [Import parameter settings \(Reset device\)](#) (p. 185)

### Procedure in case of other errors

- Open the device (only if permission is available and prerequisites are met)  
⇨ [5.5 Opening and closing GasLab Q2](#) (p. 70)
- Check all internal plug connections (all plugs are correctly seated on the sockets).
- If there are no connection errors, modules must be replaced. Please contact Honeywell to order spare parts.

# 10 Maintenance, cleaning and repair

In addition to the operational calibration (usually triggered by parameterization) a regular annual maintenance is required, to ensure long-term use.

The operator is responsible for ensuring that the installation and maintenance work described in this document is carried out correctly and that the device remains in technically perfect, safe condition throughout its period of operation. Honeywell will be happy to assist you with this work.

Maintenance consists of checking the entire system for the presence of any unusual damage that may have occurred since the time of installation and commissioning, and preventive checks such as checking the possible ranges of consumables.



## PROHIBITION INTERDICTION

Carry out any of the work mentioned in this section if you do not have.  
*D'effectuer l'un des travaux mentionnés dans cette section si vous n'avez pas.*

- the necessary instructions from the manufacturer or his authorized representatives.  
*les instructions nécessaires du fabricant ou de ses représentants autorisés.*
- the permission of the plant operator.  
*l'autorisation de l'exploitant de l'installation.*



Honeywell recommends that the completed maintenance work and general operations are documented.

Cleaning and, if necessary, Honeywell service work or repairs are the resulting outcome of this maintenance.

## 10.1 Spare parts and repairs

For spare parts and repairs please write an email to our service.

[PMT-Reparatur@Honeywell.com](mailto:PMT-Reparatur@Honeywell.com)

## 10.2 Maintenance and maintenance intervals at a glance

Using the list below and the other sections, check the possible ranges of consumables and the presence of any unusual damage that may have occurred since the time of installation and commissioning. Equipment cleaning and documentation of the work performed complete the maintenance.



### **DANGER**

#### **Incorrect or non-performed maintenance work**

Health and property damage as well as incorrect measurement results are possible

The operator must regularly check all safety devices for operability, if necessary, also outside the maintenance interval. The provisions for explosion protection (e.g. per IEC EN 60079-14) must be observed.



### **DANGER**

#### **Travaux de maintenance incorrects ou non exécutés**

*Des dommages à la santé et à la propriété ainsi que des résultats de mesure incorrects sont possibles.*

*L'opérateur doit vérifier régulièrement le fonctionnement de tous les dispositifs de sécurité, si nécessaire également en dehors de l'intervalle de maintenance. Les dispositions relatives à la protection contre les explosions (par exemple selon la norme CEI EN 60079-14) doivent être respectées.*

Not all maintenance work, for example replacing the battery, can be carried out by the user. The following overview lists all possible maintenance work and intervals. This monitoring can also be performed more frequently in order to detect deviations at an early stage. If necessary, please arrange a service appointment.

- Visual inspection. Fill in the "First inspection" ⇔ [10.6.1 First inspection](#) (p. 281) form one month after commissioning.
- Close-up inspection(s) every twelve months. Document results (e.g. use "Service report template" ⇔ [10.6.2 Template for documentation of the work performed](#) (p. 282))
- Complete a service calibration see ⇔ [10.3.11 Completing a service calibration](#) (p. 270) every twelve month.

**Main areas for the annual inspection**

- Check the gas connections using a tightness test with gas leak detector.
- Check the battery capacity (if replacement is necessary, it must be done as part of a service visit)
- Check the housing parts
- Check the external elements with tools (is everything secure)
- Monitor the vent / breather element
- Conduct a visual inspection of the connections (electrical / mechanical)
- Inspect the interior of the device
- Visual inspections / cylinder pressure ( calibration gas)/ of inlet pressures /of flow rates. (compare pressure gauge /flow meter with values at start-up).
- Conduct a visual inspection of the integrated particle filter in the process gas pipeline and replace it if necessary (only possible during a service visit).
- Check the mechanical strength of the electrical grounding and test it for low resistance

Replacing the consumables (only possible during a service visit)

- Particle filter for process gases, depending on impurities, every 1 to 3 years
- Sensor block due to ageing of the bulb in the IR sensor, every 3 to 5 years
- Lithium cell battery, depending on use, as a precaution every 10 years



**If you operate the device official (fiscal), please also observe the applicable regulations regarding sealing and closing off the housing before opening it. If you have any questions, please contact Honeywell.**

## 10.3 Inspection work in detail

### 10.3.1 Checking the battery charge

The battery of the device is mainly stressed when the voltage supply is permanently switched off or is switched off and on again more frequently. When the voltage supply is connected, the consumption of the battery can be neglected.

The battery must be replaced when the charge drops to less than 20%. In addition, the battery loses energy due to aging and must be replaced with a new one after 10 years at the latest. Check the battery charge on the info display (device monitor).



**NOTICE Discharged battery**  
**AVIS Batterie déchargée**

The device will no longer start correctly, Measurement data will be lost. Check battery charge at least once a year.

*L'appareil ne démarre plus correctement, les données de mesure sont perdues.  
Vérifiez la charge de la batterie au moins une fois par an.*

**Procedure:**

- On the device or the remote operation panel activate: Home- display – Info – Device monitor
- Read off the **Battery state of charge** and note the value in the maintenance report.

Info	Device monitor	15:17:38
Operating hours	430 h	
Battery state of charge	100.00 %	
CPU load	54.32 %	
RAM load	46.02 %	
<a href="#">Reset battery status to 100%</a>		

Fig. 10-1: Display Device Monitor

**Result evaluation and further procedure:**

- Charge > 50 % Battery can be used for another year.
- Charge < 50 % Check battery more frequently
- Charge < 20% Replace battery if necessary inform Honeywell for this purpose.

## 10.3.2 Info display (Display test)

Using the display test, you can check whether the device display is working correctly. Not all enCore devices have a display.

Prerequisite(s)

- Home display is shown, switch to this display with  if necessary.

### Steps

- 01 Open the **Info** display behind the symbol 
- 02 Start the test with the action [Display test](#). All pixels of the data area are shown alternately black and white. Defective pixels keep their color.
- 03 End the test with  or .

If the test shows that the display is faulty and a number of pixels are not responding, it may be necessary to replace the display. This is done by changing the affected module.



This function is also remote available, but in this case the test result is not meaningful. → [8.6 The Remote operation panel actions](#) (p. 243)

## 10.3.3 Check the tightness of the installation



### DANGER

#### Leaky gas installation *Installation de gaz non étanche*

Leaks increase the risk of explosion and can cause serious damage to health and considerable damage to property.

*Les fuites augmentent le risque d'explosion et peuvent causer de graves dommages à la santé et des dommages matériels considérables.*

Do not work with leaking gas installations. Use a suitable gas leak detector to check all parts of the installation. Eliminate leaks immediately or shut off the affected area immediately.

*Ne travaillez pas sur des installations de gaz qui fuient. Utilisez un détecteur de fuites de gaz approprié pour contrôler toutes les parties de l'installation. Éliminez immédiatement les fuites ou fermez immédiatement la zone concernée.*

### Check the tightness before the device

Prerequisite(s)

- The valves in the device are closed (No power supply)

#### Following tools and materials are available:

- Gas leak detector for flammable gases, calibrated with status or value display

### Steps

- 01 Apply gas and pressure to all inlet gas lines of the measuring device so that a gas volume is present in the lines.
- 02 Use a gas leak detector to check all parts of the installation up to the instrument for leaks.
- 03 If gas leak detector shows leaks, Immediately shut off the affected parts of the gas line system and depressurize them. ⇨ [Procedure in case of leaks](#) (p. 262). Otherwise the check is finished.

### Check the tightness downstream device

Prerequisite(s)

- The device is in operation and gas is flowing through it.

#### Following tools and materials are available:

- Gas leak detector for flammable gases, calibrated with status or value display

### Steps

- 01 Use a suitable gas leak detector to check all parts of the installation behind the device (exhaust gas lines) for leaks.
- 02 If gas leak detector shows leaks, take the device out of operation immediately and shut off the affected parts of the gas pipe system. ⇨ [Procedure in case of leaks](#) (p. 262). Otherwise the check is finished.

### Procedure in case of leaks

#### Steps

- 01 Immediately switch off the affected parts, depressurize and de-energize them.
- 02 Do not use the device elimination of leaks.
- 03 Eliminate / seal the leak!
- 04 Check the effectiveness of your measures!!  
Repeat ⇨ [10.3.3 Check the tightness of the installation](#) (p. 261)

## 10.3.4 Check cylinder pressure (visual check)

### General

- Operation without calibration gas is possible, the results will be less accurate

### Prerequisite(s)

- Maintenance work is performed on the device.
- Planning for storage.

### Steps

- 01 Read the cylinder pressure of the calibration gas on the pressure gauge of the gas cylinder.
- 02 Note the result in the maintenance report or your planning documents.

### Further procedure

- With a cylinder pressure of significantly more than 1.0 MPa(g) use until next maintenance is possible.
- With a cylinder pressure less than or around 1.0 MPa(g) the gas supply is not sufficient until the next maintenance. You can empty the cylinder to a minimum pressure of 0.5 MPa. Inform Honeywell if a new calibration gas mixture or carrier gas is required.

## 10.3.5 Check inlet pressures (visual check)

### Valid pressure ranges

- Process gas inlet pressure (PG) is between 0.15 MPa(g)  $\pm$ 1.5bar(g) and 0.3 MPa(g)  $\pm$ 3bar(g)
- Calibration gas inlet pressure (CAL) is between 0.15 MPa(g)  $\pm$ 1.5bar(g) and 0.25 MPa(g)  $\pm$ 2.5bar(g)

### Prerequisite(s)

- Maintenance work is performed on the device.
- Pressure errors are displayed.

### Steps

01 Read process gas inlet pressure and calibration gas inlet pressure on pressure gauges.

02 Note result in the maintenance report or similar documents.

### Further procedure

- If the pressure is inside the valid ranges the check is done,  
If the pressure is outside the valid ranges, use the control devices in the supply lines to bring it into a valid range.
- If the pressure cannot be adjusted to a valid range, disconnect the gas and power supplies and do not use the unit until repair is made. Contact Honeywell for a service call.

## 10.3.6 Checking flows (optical control)

### Prerequisite(s)

- Maintenance work is performed on the device.
- Pressure errors are displayed.

### Steps

01 Read the flow rates at the floats.

02 Check if float is in the range between the lower and upper markings

03 Check if a process gas pressure alarm pending.

04 Note result in the maintenance report or similar documents.

### Further procedure

- Readjust flow rates. If this is not possible with valid inlet pressure, check if calibration gas pressure alarm is issued during calibration. If no calibration gas pressure alarm is issued, the particle filter at the inlet must be replaced.
- If an alarm is issued in either case, the fault is in the gas management or sensor system. Contact Honeywell for a service call.
- As long as the settings are not in a valid range, disconnect the gas and power supply and do not use the device until it is repaired.

## 10.3.7 Check housing parts (visual inspection)

### General



#### NOTICE AVIS

The housing may only be repaired by Honeywell. Explosion-proof equipment not repaired by the manufacture may be not used again

*Le boîtier ne peut être réparé que par Honeywell. Les équipements antidéflagrants qui ne sont pas réparés par le fabricant ne peuvent plus être utilisés.*

#### Prerequisite(s)

- Maintenance work is performed on the device.
- Unusual changes at the place of use.

#### Steps

- 01 Check all housing parts (including built-in parts such as flow meter or additional parts such as local display) for damage and loose components.
- 02 Tighten loose parts if existing. Set unscrewing locks in function and note the result in the maintenance report or your documents.

#### Further procedure

- If all components are undamaged and bolts and fasteners are in proper condition the use until next maintenance is possible.
- If damaged parts present inform Honeywell, disconnect the gas and power supply and do not use the deviec until it has been repaired.

## 10.3.8 Check connections (visual check)

### Prerequisite(s)

- Maintenance work is performed on the device.
- Unusual changes at the place of use.

### Steps

- 01 Check connections (fluidic / electrical) to determine if they are undamaged, complete and free of corrosion.
- 02 Replace defective components and close unused openings, if existing! Observe the explosion protection rules!
- 03 Note result in maintenance report or your documents.

### Further procedure

- If all components are undamaged, complete and free of corrosion the use until next maintenance is possible.
- If damaged parts present, you can not replace, inform Honeywell, disconnect the gas and power supply and do not use the device until it has been repaired.

## 10.3.9 Check breather(s) / device venting

### Prerequisite(s)

- Maintenance work is performed on the device.
- Unusual changes at the place of use.

### Steps

- 01 Check whether the openings on the breather and connected components, e.g. ventilation line or swan neck, are free of dirt and blockages.
- 02 Remove the dirt if existing! Do not pour or spray water or cleaning agent into the breather system!
- 03 Note result in maintenance report or your documents.

### Further procedure

- If there is no contamination or if it has been successfully removed, the use until next maintenance is possible.
- If dirt is still present, a service call is required. Inform Honeywell. Do not carry out any further actions or work, do not use the device any longer until the breathing organ and / or the ventilation line are in perfect condition again.

## 10.3.10 Check device internally (visual inspection)

### Prerequisite(s)

- Opening of the device is permitted by the plant operator.
- Maintenance work is carried out on the device.
- Unusual changes at the place of use.

### Following tools and materials are available:

- Service standard tools
- Some small cable ties
- Gas leak detector for flammable gases, calibrated with status or value display
- ESD wrist strap or similar device to prevent electrostatic discharge

### Steps

#### Preparations for opening and opening the device:

- 01 De-energize the device (switch off power).
- 02 Make sure that there is no voltage, e.g. with a multimeter.
- 03 Turn off gas supply, block the device from all gases.
- 04 Monitor the environment for the presence of an explosive atmosphere, e.g., with a gas leak detector, continuously during the entire process.
- 05 Ensure there is no explosive atmosphere. Only then open the device.  
⇒ [5.5.1 Opening GasLab Q2](#) (p. 70)

**DANGER EXPLOSIVE ATMOSPHERE / HOT SURFACES****Damage to health and property (explosion) possible**

Stop work immediately if an explosive atmosphere occurs!

The sensor block is heated up to 70 °C!

Let it cool down, be careful not to burn yourself.

**DANGER ATMOSPHERE EXPLOSIVE / SURFACES CHAUDES****Possibilité d'atteinte à la santé et aux biens (explosion)**

Arrêtez immédiatement le travail en cas d'atmosphère explosive !

Le bloc capteur est chauffé jusqu' à 70°C  $\pm$ 158°F !

Laissez-le refroidir, en veillant à ne pas vous brûler.

**Check the device and close it again**

- 01 Avoid electrostatic discharges, e.g. with an ESD wrist strap.
- 02 Check all components for damage and correct connections.
- 03 Re-tighten loose connections, if present, and note the result in the maintenance report or your documents.
- 04 Close the device again  $\Rightarrow$  [5.5.2 Closing the housing of Gaslab Q2](#) (p. 72)
- 05 If there is no corrosion or damage and all wires are firmly connected (again), supply the device with power, otherwise contact Honeywell for a service call and do not use the device until it has been repaired.

### 10.3.11 Completing a service calibration

This annual calibration (can also be performed more frequently if required) with 2 special gases is used to maintain the measurement accuracy.

One gas input, usually the calibration gas input, must be connected to the service calibration gases for this procedure. For non-fiscal use, you may perform this calibration yourself.



Have this work carried out by the manufacturer, or personnel contracted or trained by it, in order to rule out the possibility of malfunctions caused by an unsuccessful calibration and to avoid having to stock the special gases.

Prerequisite(s)

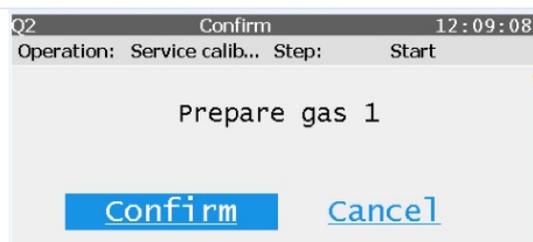
- Service calibration gases are present and available on the device in the inlet pressure range → [11.3 List of suitable gases and calibration gases](#) (p. 285)
- A suitable parameterization is in the device. This contains the components of the two service calibration gases used and the definition of the gas inputs. (Check-/correct in the Suite parameter tree under "**Q2 >>"Service calibration"**. The online help supports you.)
- You are logged in and there are no sensor errors.

**If an error occurs during execution, e.g. the pressure is not large enough, the display jumps directly to the end of the process.**

**Then complete the service calibration, eliminate the error and try again.**

#### Steps

- 01 On the device or remote operation panel, navigate to Q2 Control → **Calibration** and activate **Service calibration** **Start**
- 02 Connect the first gas (**offset gas to correct the measurement offset**) to the parameterized gas input. Observe all safety instructions when working on gas connections. Then select "**Confirm**".

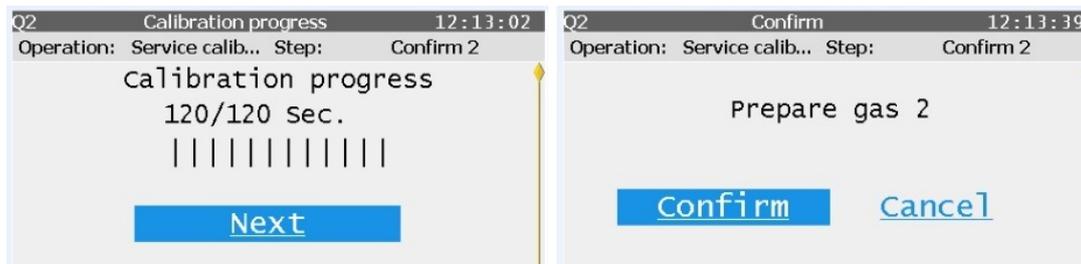


The procedure starts automatically. First, it is purged with calibration gas mixture. This is displayed, as is the duration of the procedure. Then the gas is measured. The duration of this procedure is also displayed.

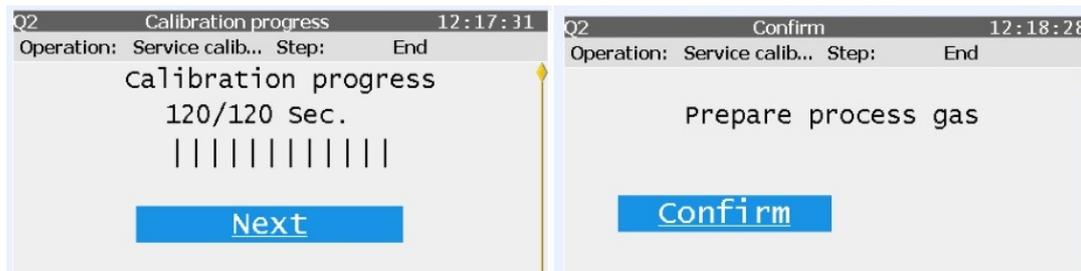


If you want to cancel the procedure prematurely, you can end it at any time by selecting **"Break"**. The measuring instrument prompts you to perform further actions, carry them out to return to the analysis mode.

- 03 After measuring the 1st gas, **"Next"** appears in the lower part of the display. After this selection, the device prompts you to connect the second service calibration gas (**gain gas correction of the measured value gain**). Connect the gas properly to the parameterized input. Then select **"Confirm"**



- 04 The procedure is repeated in the same way as for gas 1. After measuring the 2nd gas, **"Next"** appears again in the lower part of the display for switching to analysis mode. Select **"Next"** and restore the connections as they were before the service calibration! Conduct a tightness test. ⇨ [10.3.3 Check the tightness of the installation](#) (p. 261)



- 05 The message above will appear regardless of the actual gas inlets selected. Activate **"Confirm"** after all gas connections are again prepared for normal operation

 The last valid gas quality values are kept during the entire calibration time via measured value outputs. If the calibration fails, the parameters from the last successful calibration will remain in use.

## 10.4 Repairs by exchange modules and consumables

The device has hardly any consumable and wear parts..



For safety reasons, some work may only be carried out by the manufacturer or by persons authorized / trained by the manufacturer. Please make an appointment in good time, this is also a good opportunity to rectify any deviations that may have occurred during maintenance.

The device may only be opened by qualified personnel with the appropriate device knowledge and with the permission of the system operator. ⇨ [5.5 Opening and closing GasLab Q2](#) (p. 70)

ESD protection (e.g. according to EN 61340-5-1) must be provided when working on the device. Short circuits and electrostatic discharge can destroy the integrated circuits.

When used in legal metrology, the presence of a verification officer (or a representative) may also be required when opening the device.

If the required conditions cannot be established on site, the complete device must be dismantled closed.

Always remember :

- **DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT**
- **Explosion-protected equipment that has not been repaired by the manufacturer may not be reused until it has been inspected by a recognized expert and again complies with the design documents.**
- **Flame arresters are not standard replacement parts and can only be replaced after consultation with Honeywell Technology Gas Quality**

## 10.4.1 Connect/replace calibration-, verification- gas cylinders

For proper operation of the instrument, regular automatic calibration/adjustment with a calibration gas is necessary. Refer to section → [5.4 Fluidic installation of the measuring device](#) (p. 66)

As soon as the outlet pressure of a gas cylinder can no longer be kept stable, it must be replaced. Depending on the regulator, this may occur at a pressure around 1.0 MPa (g). If the pressure is below 2 MPa, you should have a replacement cylinder ready. therefore monitor the cylinder pressure with e.g. a pressure gauge or contact manometer.

The recognized rules of technology for handling gases must be observed for all work as described. Surfaces that come into contact with gas must be free of grease, oil, solvents and other contaminants. Take steps to prevent dirt and/or moisture from reaching the unit during replacement.



### DANGER

#### Incorrect handling of gas cylinders

##### *Manipulation incorrecte des bouteilles de gaz*

Serious damage to health and considerable damage to property can occur (explosion) *De graves dommages à la santé et des dommages matériels considérables peuvent survenir (explosion).*

Complete the following steps in accordance with national regulations on the basis of the information in this document. *Suivez impérativement les étapes suivantes conformément aux normes locales en respectant les instructions de ce manuel.*

#### Remove connected gas cylinder

1. Close the main valve on the gas cylinder.
2. Depressurize the connected gas pipeline.
3. Remove everything from the gas cylinder connector.
4. Close the connection thread on the valve with the screw cover (nut).
5. Place the protective cap onto the gas cylinder and screw it tightly.
6. Release the anti-tipping device and remove the gas cylinder.
7. Protect the connection thread for the remaining installation if a new gas cylinder is not to be connected immediately.

**Connecting the gas cylinder (The cylinder fittings must include safety equipment.)**

1. Secure the cylinder to prevent it from tipping over.
2. Unscrew the protective cap from the gas cylinder.
3. Make sure that the main valve on the bottle is closed. Only then remove the screw cover (dummy plug) from the valve connector
4. Make sure that the handwheel or the adjusting screw for the outlet pressure of the high pressure reducer\* or cylinder pressure regulator\* to be connected is closed. (\* not automatically included in the scope of delivery, use only suitable standard-compliant types).
5. Connect the cylinder connector on the high pressure reducer or cylinder pressure regulator to the valve connector on the gas cylinder. Do not apply any oil or grease to the thread.
6. For accuracy reasons, now flush the pressure reduction as described in the next activity block.
7. After the flushing cycle, connect the outlet of the pressure reducer to the appropriate gas inlet on the device using a fixed pipeline. If this is not yet possible, seal the gas pipeline with a dummy plug so that you can continue with step 8 later.
8. Open the main valve of the gas cylinder. Set the outlet pressure of the high pressure regulator or cylinder pressure regulator / cylinder pressure reducer to the working pressure approx. 0.2 MPag  $\pm$  29.01psig  $\pm$  2barg Maximum pressure 0.25 MPag  $\pm$  36.26psig  $\pm$  2.5barg..
9. check the tightness carefully! Perform leakage test for all connections. (See installation tightness check).

**Manual flushing of the high pressure reducer**

1. Make sure that steps 1 to 6 of the activity block "Connecting the gas bottle" have been carried out. and a gas flow can take place in the parts to be purged, for this purpose the gas line must be disconnected directly in front of the unit (gas bottle closed!). Ensure that the purging gas is discharged professionally and safely.
2. Slowly open the main valve on the gas cylinder.
3. Adjust the stream of gas and observe it using the flow indicator e.g. by using a flow indicator. Do not exceed the maximum pressure levels.
4. Now close the main valve on the gas cylinder.
5. If the outlet pressure of the high pressure reducer or cylinder pressure regulator has fallen to almost 0 MPa, open the gas cylinder briefly and then close it again.
6. Repeat the procedure described in step 5 several times to ensure that there is no more air in the dead space of the regulator and the pipeline. Everything will be flushed after a total of 5 filling and emptying cycles.
7. After the purging procedure, immediately proceed to step 7 of the " Connect gas cylinder" activity block to prevent contamination.

## 10.4.2 Tips for sealing the leak

When leaks are detected, they need to be sealed. You have a few options to do this..

- Tighten the connections.  
In the course of time, connections may have loosened slightly. By retightening them, they can be resealed. For small sizes, be careful not to block the flow of the gas with this measure. Do not overtighten the thread.
- Replace the seals.  
You will need the appropriate replacement seals. Switch off the gas supply for this purpose, observe the explosion protection rules and the assembly instructions in the following section.

### 10.4.3 Remove of the battery

For long time storing or disposal the battery has to be removed. If the battery charge was too low according to the display, or a new board is delivered without battery, a replacement lithium battery must be inserted.

Prerequisite(s)

- Opening of device is permitted by plant operator.
- Ambient conditions according to ISO / IEC61010-1 (temperatures / humidity as in living and office spaces).
- The parameterization of the device was read out with enSuite, ⇨ [Read-out parameterization](#) (p. 180)

**The following tools and materials are available:**

- Service standard tools
- Gas leak detector for flammable gases, calibrated with status or value display
- ESD wrist strap or similar device to prevent electrostatic discharge

#### Steps

**Preparations for opening and opening the device:**

- 01 De-energize the device (switch off power).
- 02 Make sure that there is no voltage, e.g. with a multimeter.
- 03 Turn off gas supply, block the device from all gases.
- 04 Monitor the environment for the presence of an explosive atmosphere, e.g., with a gas leak detector, continuously during the entire process.
- 05 Ensure there is no explosive atmosphere. Only then open the device.  
⇨ [5.5.1 Opening GasLab Q2](#) (p. 70)



**DANGER EXPLOSIVE ATMOSPHERE / HOT SURFACES**

**Damage to health and property (explosion) possible**

Stop work immediately if an explosive atmosphere occurs!

The sensor block is heated up to 70 °C!

Let it cool down, be careful not to burn yourself.



**DANGER ATMOSPHÈRE EXPLOSIVE / SURFACES CHAUDES**

**Possibilité d'atteinte à la santé et aux biens (explosion)**

Arrêtez immédiatement le travail en cas d'atmosphère explosive !

Le bloc capteur est chauffé jusqu' à 70°C ≅158°F !

Laissez-le refroidir, en veillant à ne pas vous brûler.

**Working on the battery holder:**

- 01 Avoid electrostatic discharges, e.g. with an ESD wrist strap.
- 02 Gain access to the battery holder. Position see description of the hardware parameter protection → [Use of hardware parameter protection \(SSW\)](#) (p. 95)
- 03 Remove the battery cover above the battery holder (not present on all boards). Use a small screwdriver to carefully loosen the tabs on the sides.

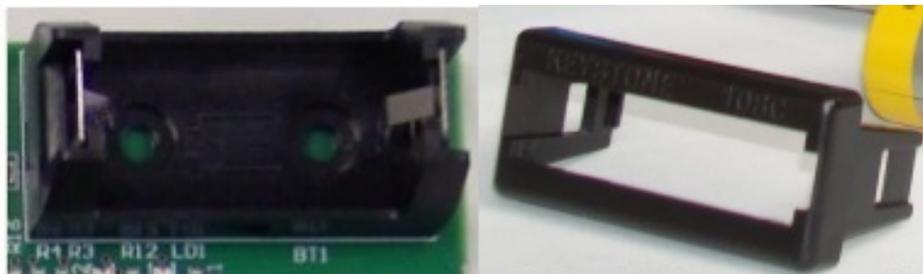


Fig. 10-2: Battery holder

- 04 Take off the battery cover and take out the old battery.



Data retention is guaranteed by a capacitor for 15 minutes.

**Further procedure after removing**

- When the device is no longer in use, it can be stored for an unlimited period of time after assembly. Disposal is also now possible in accordance with local regulations.
- When the device is to be used further, **a service technician** must insert a new battery **EVE ER14250; 3.6 V** within 15 minutes. **The use of other types is prohibited.**

## 10.4.4 Replacing the memory card

All data of the device are stored on the SD card (flash memory card). This card is located on a separate board called CPU3 CORE. See marking on the figure. The mounting position depends on the device.

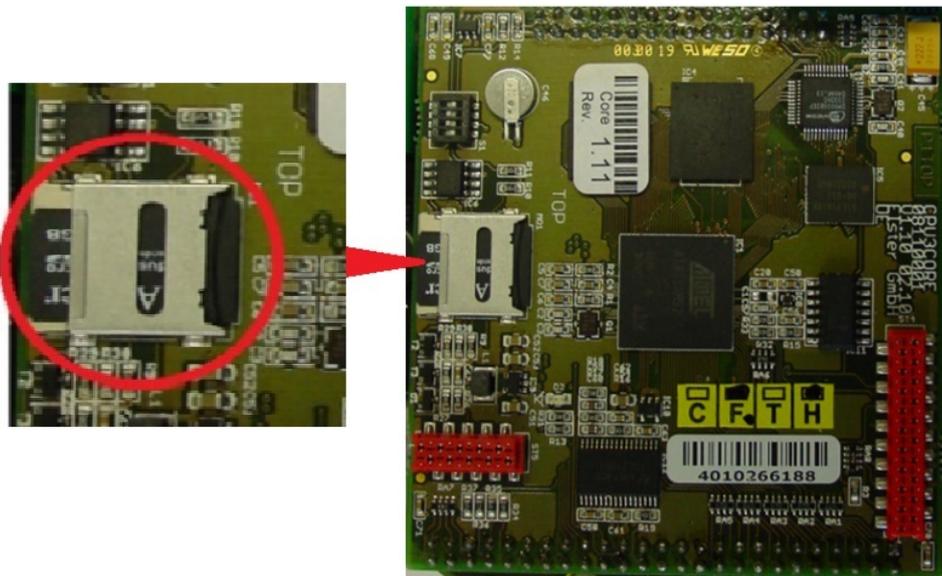


Fig. 10-3: CPU board with memory card

### Prerequisite(s)

- Parameterizations, and archives have been saved outside the device (in enSuite or on a PC)
- Device is de-energized and open. There is no explosive atmosphere. This is monitored e.g., with a gas leak detector, continuously during the entire process.
- The CPU3 CORE board, see figure above, can be accessed, the HMI module has been removed for this purpose if necessary.
- You have a replacement card with the required software from Honeywell.
- You have a way to connect the card to your PC / laptop to make final adjustments. (in this case Honeywell will provide you with the necessary information and programs)
- ESD wrist strap or similar device to prevent electrostatic discharge.

### Steps

- 01 Avoid electrostatic discharges, e.g. with an ESD wrist strap.
- 02 Open the holder by first pushing the cover to the edge and then folding it away to the front. Compare with the red border in the figure above.
- 03 Remove the SD card and insert the new one (if necessary after last adjustments)
- 04 Close the holder by folding the cover back again and then pushing it back to the initial position.

## 10.5 Cleaning of equipment

For cleaning, only use tools that will not accumulate static charge and generate sparks. Ideally, you could use a damp cloth. As a rule, a mild cleaning solution or a mild glass cleaner as used in the household can be used. Always note the following



### **PROHIBITION/INTERDICTION**

- Use of aids which can become statically charged and produce sparks. *Utilisation d'aides qui peuvent se charger en électricité statique et produire des étincelles.*
- Pouring or spraying water or cleaning agents directly into the respiratory system or the vent line! *Verser ou pulvériser de l'eau ou des produits de nettoyage directement dans le système respiratoire ou dans le tuyau de ventilation !*
- Use of high-pressure cleaners or similar devices. *Utilisation de nettoyeurs à haute pression ou de dispositifs similaires*

## 10.6 Documentation of the work

Honeywell recommends that the completed maintenance work and general operations are documented. This documentation is in fact mandatory in some countries and at some institutions.

Below are templates to help you document the work performed. Copy the form, enter your results, and archive your findings with the other documentation of the device.

To ensure that the work performed during installation and commissioning and after modifications maintains its function over the long term, review the items on the ⇨ [10.6.1 First inspection](#) (p. 281) form **after one month** .

To document proper maintenance, you can use the ⇨ [10.6.2 Template for documentation of the work performed](#) (p. 282)



Naturally, you will also receive detailed documentation of the work if you have it completed by Honeywell service technicians. In this case, these documents need to be archived.

## 10.6.1 First inspection

To ensure that the work carried out during installation and start-up remains functional in the long term, check the following points after one month. Complete the form.

First inspection	Date of inspection ____ . ____ . 20____	
Gaslab Q2	Serial number: _____ Software: _____	
Inspector/Company:		Result Yes/No
_____		
Gas connections, gas lines and flow meters have been checked with a methane detector and are tight.		
Housing parts (washer/flow meter) are undamaged and secure.		
The openings in the breather elements are free of dirt and blockages.		
Gas and electrical connections are undamaged and free of corrosion.		
No corrosion inside the device, all cores are securely connected.		
Pipelines and cables around the Q2 are undamaged and free of corrosion.		
The ground connection is mechanically secure. There is a low resistance connection to the ground, both between the equipotential bonding system on the connection box (FE) and the external grounding connection (PA), the specifications in the operating instructions have been met.		
Unused connectors are sealed, there are no unconnected wires in the connection box.		
The cylinder pressure of the calibration gas mixture is: _____		
The inlet pressures are in the valid range: Process gas pressure: _____ Calibration gas pressure: _____		
The flow rates (flow meter display) are in the valid range.		
The battery charge is: _____ and is adequate.		

## **10.6.2 Template for documentation of the work performed**

Maintenance/Service	Report number: _____	
Gaslab Q2	Serial number: _____ Software: _____	
Date of work ____. ____ 20____	Inspector/Company: _____	Result Yes/No
Gas connections, gas lines and flow meters have been checked with a methane detector and are tight.		
Housing parts (washer/flow meter) are undamaged and secure.		
The openings in the breather elements are free of dirt and blockages.		
Gas and electrical connections are undamaged and free of corrosion.		
No corrosion inside the device, all cores are securely connected.		
Pipelines and cables around the Q2 are undamaged and free of corrosion.		
The ground connection is mechanically secure. There is a low resistance connection to the ground, both between the equipotential bonding system on the connection box (FE) and the external grounding connection (PA), the specifications in the operating instructions have been met.		
Unused connectors are sealed, there are no unconnected wires in the connection box.		
Service calibration completed Date: _____		
The cylinder pressure of the calibration gas mixture is higher than 0.5MPa $\triangleq$ 72.52psi $\triangleq$ 5bar. The pressure is: _____		
The operational calibration gas cylinder was replaced***		
The inlet pressures are in the valid range: Process gas pressure: _____ Calibration gas pressure: _____		
The flow rates (flow meter display) are in the valid range.		
The particle filter was replaced* or inspected		
The sensor block was replaced**		
The battery charge is above 20% and is: _____		
The battery was replaced by Honeywell***		

\* Must only be completed if blocked or for preventive reasons, for example after 3 years  
 \*\* Must only be completed if measuring errors occur, for example after 5 years  
 \*\*\* Must be completed after 10 years or if the battery charge/pressure is low

# 11 Technical data and information

In the following, the technical data and device specifications are given, as far as they are not already included in the data sheet. The data from the CE declaration complete this overview.

## 11.1 Explosion protection data and approval data

Ex rating	
ATEX	IIG Ex db IIC T4 Gb (Ta: -25°C ≤ Ta ≤ + 55°C)
IECEX (JPEX)	Ex db IIC T4 Gb (Ta: -25°C ≤ Ta ≤ + 55°C)
FM(us)	Class I Zone 1 AEx db IIC T4 Gb Ta: -25°C ≤ Ta ≤ + 55°C / Class I Div 2 Groups ABCD T4
cFM	Ex db IIC T4 Gb Ta: -25°C ≤ Ta ≤ + 55°C / Class I Div 2 per CEC J18-150
Pursuant to the standards:	
IECEX	IEC 60079-0 IEC 60079-1
ATEX:	EN 60079-0 EN 60079-1
FM standards	Class 3600 Class 3810
ANSI	ANSI/ISA 60079-0 ANSI/UL 60079-1 ANSI/ISA 61010-1
CAN/CSA	C22.2 No. 0.4      C22.2 No. 0.5 C22.2 No. 61010-1      C22.2 No. 60079-0 C22.2 No. 60079-1
JPEX	JNIOOSH-TR-46-1      JNIOOSH-TR-46-2
UKCA	DEKRA 21UKEX0081X

## 11.2 Measurands and accuracies



Information on measured variables and accuracies can be found in the data sheet of the device.

All calculated values according:

- ISO 6976-1995 T1: 25°C; T2: 0°C; P1, P2: 1013.25 mbar
- GPA 2172-2009: T1, T2: 60°F; P1, P2: 14.696 psi (using GPA 2145 - 2009 tables)

## 11.3 List of suitable gases and calibration gases



### PROHIBITION INTERDICTION!

- Gases which may react when there is no air  
*Gaz qui peuvent réagir en l'absence d'air*



The list of suitable gases can be found in the data sheet of the instrument.  
This list must always be observed.

To avoid mistakes when selecting the calibration gas (a mixture of CH<sub>4</sub> + CO<sub>2</sub>), the following specifications must be observed. The proportions of the gas components depend on the CO<sub>2</sub> range of the gas to be measured. All items must be completely fulfilled, otherwise please contact Honeywell.

Measuring range CO <sub>2</sub>		Operational calibration gas; permanent installed at Q2; for offset correction; regular use according parametrization	Service calibration gas; not permanent installed; for gain correction; suggested every year
min 0	max 5 mol %	2 mol% CO <sub>2</sub> + CH <sub>4</sub> balance Blend tolerance: ±2 % rel. Accuracy: ± 1 % rel. CO <sub>2</sub> quality: N4.5 CH <sub>4</sub> quality: N4.5	5 mol% CO <sub>2</sub> + CH <sub>4</sub> balance Blend tolerance: ±2 % rel. Accuracy: ± 1 % rel. CO <sub>2</sub> quality: N4.5 CH <sub>4</sub> quality: N4.5
min 0	max 20 mol %	10 mol% CO <sub>2</sub> + CH <sub>4</sub> balance Blend tolerance: ±2 % rel. Accuracy: ± 1 % rel. CO <sub>2</sub> quality: N4.5 CH <sub>4</sub> quality: N4.5	20 mol% CO <sub>2</sub> + CH <sub>4</sub> balance Blend tolerance: ±2 % rel. Accuracy: ± 1 % rel. CO <sub>2</sub> quality: N4.5 CH <sub>4</sub> quality: N4.5

Calibration gas container: (not always included in the scope of delivery)	Ranges/Variables (with automatic calibration cycle)
10 l gas cylinder with cylinder pressure greater than 2.0 MPag ±20 barg. Other accessories required: pressure regulators and connection lines	Flow rate of calibration gas during calibration: 30 l/h – 60 l/h recommended setting Minimum 0.15 MPag ±1.5 bar Normal 0.20 MPag ±2.0 bar Maximum 0.25 MPag ±2.5 bar



### Further information

- Gas connections ⇨ [5.4.1 Fluid interfaces](#) (p. 67)  
Gas Manifold / Gas management  
⇨ [4.1 Description of the measuring method](#) (p. 56)

## 11.4 Notes on device characteristics and operating conditions



Basic information about the device's properties and operating conditions can be found in the device's data sheet. Also note the following:

GasLab Q2 system	Values and/or comments
Place of use	Installation close to the sampling point up to Ex Zone 1 at atmospheric pressure, gas outlets with no back pressure.
Breather line	Connection at breather element: 1/4" NPT
Housing dimensions	L = 38cm $\pm$ 14.96 ", W = 27cm $\pm$ 10.63 ", H = 23cm $\pm$ 9.06 "
Weight	16kg $\pm$ 36 lb
Installation gaps:	At least 300 mm to the left and right, at least 200 mm $\pm$ 7.87 " at the top and bottom (recommended 900 x 900 mm $\pm$ 35.43 x 35.43 ")
Appr. Heating time	20 min at 20°C $\pm$ 68°F $\pm$ 293 K / 1 hour at -25°C $\pm$ -13°F $\pm$ 248 K
Interval settings	1 week for operational calibration
1 year for service calibration	1 year for service calibration
Operating system	Service PC: See download section
Software	EnSuite
File format	enSuite.csv/enSuite.par
Data logger	Integrated (interval adjustable) Archives/Calibration data/Parameterization/Logbooks
Data output	All data can be supplied in XML format.
Communication Speed:	345,600 Baud TCP/IP (serial)
EMC strength	Electrostatic discharge to IEC 61000-4-2 [25]
Mechanical strength	Vibration to IEC 60068-2-64 [20]; IEC 60068-2-47 [19]
Digital outputs:	2 for 24 V DC (common earth, electrically isolated) 1 NC contact (closed when de-energized, suitable for general alarms) 1 NO contact

## 11.5 Supported data protocols

### Protocols at a glance

#### GasLab Q2, proChain GC and device series Q.Sonic

Communication	Supported data protocols
Ethernet	<ul style="list-style-type: none"> <li>• HTTP (<i>only up to Basic System V03-38</i>)</li> <li>• MMS (secured via TLS)</li> <li>• Modbus TCP</li> <li>• NTP</li> </ul>
serial (RS232, RS485)	<ul style="list-style-type: none"> <li>• Modbus (ASCII, RTU)</li> <li>• UNIFORM</li> </ul>



#### Use secure version of a protocol!

Unencrypted protocols transmit data in plain text, such as Modbus. If possible, use the secure version of a protocol.

### Protocols in detail



#### For unencrypted protocols, consider country-specific regulations!

Please note that with some protocols the data communication is unencrypted. This is the case, for example, with communication via Modbus und IEC 60870-5-104.

Unencrypted data communication does not prevent an attacker from intercepting or modifying the communication. Consider the country-specific regulations. These may require manual verification of the data.

### HTTP

Default port: 80

Until Basic System 03-38, **H**yper**T**ext **T**ransfer **P**rotocol enabled e.g., access to an enCore device via the remote control panel.

Please note that HTTP is considered insecure today and is no longer supported since Basic System 03-39!

## MMS

Default port: 102

Note: Typically, port 3782 is used instead of port 102 for secure communication. For reasons of downward compatibility, enCore devices use the standard port 102.

**M**anufacturing **M**essaging **S**pecification (according to ISO standard 9506) enables communication between enSuite and enCore devices, e.g., allows access to an enCore device via the remote control panel.

For reasons of data security, enCore devices since Basic System 03-39 only support MMS connections that are secured via TLS (**T**ransport **L**ayer **S**ecurity), i.e., the data is transmitted encrypted and the authentication of the enCore devices is ensured via a certificate.

## Modbus (ASCII, RTU)

Default port: –

Protocol for data exchange of user-defined registers between central control station and enCore device (Modbus AFB and “intelligent protocols” (GC, USM)) via a serial asynchronous point-to-point data connection via RS232C or a multipoint connection via RS422 or RS485.

## Modbus TCP

Default port: 502

Protocol for data exchange of user-defined registers between central control station and enCore devices (Modbus AFB and “intelligent protocols” (GC, USM)) via a standard TCP/IP network

## NTP

Default port: 123

**N**etwork **T**ime **P**rotocol for the time synchronization of enCore devices with an NTP time server.

## UNIFORM

Default port: –

UNIFORM is a manufacturer-specific protocol for the connection of Q.Sonic ultrasonic gas meters (USM), up to series IV.

## 11.6 Certificates and approvals

### 11.6.1 EU declaration of conformity

The EU declaration of conformity lists all European health, safety, and environmental protection standards whose requirements the product meets. It is enclosed as hardcopy with the delivery of the device.

The following provides an extract from the declaration. The complete declaration of conformity and associated documents can be downloaded in PDF format from our Docuthek ([www.docuthek.com](http://www.docuthek.com)).

**This declaration of conformity is valid for the following Directives:**

*Diese Konformitätserklärung gilt für folgende Richtlinien:*

2014/30/EU (EMC)	2014/34/EU (ATEX)	2011/65/EU (RoHS)
------------------	-------------------	-------------------

The object of the declaration described above is in conformity with the relevant harmonization legislation from the European Union:  
*Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Europäischen Union:*

EN/IEC 61326-1:2013	EN 60079-0:2012/A11:2013 EN 60079-1:2014	EN 50581: 2012
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**Certificates and interventions by notified bodies:**

*Bescheinigungen und Maßnahmen durch notifizierte Stellen:*

Not applicable <i>Entfällt</i>	DEKRA 15 ATEX 0113 X	Not applicable <i>Entfällt</i>
	EU-type examination <i>EU-Baumusterprüfung</i>	
	Notified Body 0344 DEKRA Certification B.V. Meander 1051 NL-6825 MJ Arnhem	

**This declaration of conformity is valid for products labelled accordingly:**

*Diese Konformitätserklärung gilt für entsprechend gekennzeichnete Produkte:*

	 0044 	
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**The production is subject to the following surveillance procedures:**

*Die Herstellung unterliegt folgenden Überwachungsverfahren:*

Directive Annex II <i>Richtlinie Anhang II</i>	Directive Annex IV+VII <i>Richtlinie Anhang IV+VII</i>	Directive Article 7 <i>Richtlinie Artikel 7</i>
Not applicable <i>Entfällt</i>	Notified Body 0044 TÜV NORD CERT GmbH D-30519 Hannover	Not applicable <i>Entfällt</i>

## 12 General notices

### 12.1 Technical support Flow Computers and Gas analyzers

Our support of Elster Gas is available for technical advice as well as repairs.

To find further information visit our support site of Elster Gas:

[process.honeywell.com/us/en/site/elster-instromet/support](https://process.honeywell.com/us/en/site/elster-instromet/support)



#### **Use secure communication!**

Use secure communication, such as email encryption, to send confidential data.

### 12.2 Third-party trademarks

All used or mentioned brand names are the property of their respective owners. A possible mention of brands is done in good faith and without any intention to derive a claim.

### 12.3 Third-party licenses

This product may contain or be derived from materials, including software, of third parties. The third party materials may be subject to licenses, notices, restrictions and obligations imposed by the licensor.

The licenses, notices, restrictions and obligations, if any, may be found in the materials accompanying the product, in the documents or files accompanying such third party materials, in a file named `Third_Party_Licenses_enCore.pdf` at:

[process.honeywell.com/us/en/site/elster-instromet/about-us](https://process.honeywell.com/us/en/site/elster-instromet/about-us)

### 12.4 Warranty Conditions

You will find our current warranty conditions in the General Terms and Conditions, for example, on our website:

[process.honeywell.com/us/en/site/elster-instromet/about-us](https://process.honeywell.com/us/en/site/elster-instromet/about-us)

## 12.5 How to report a security vulnerability

A security vulnerability is defined as an error or weakness in the software that can be exploited to impair the operation or security of the parameterization or device software or to access sensitive data.

Honeywell investigates all reports of security vulnerabilities affecting Honeywell products and services. For details on Honeywell security policy, visit:

[www.honeywell.com/us/en/product-security](http://www.honeywell.com/us/en/product-security)

To report a potential security vulnerability against any Honeywell product, please follow the instructions at:

[www.honeywell.com/us/en/product-security#vulnerability-reporting](http://www.honeywell.com/us/en/product-security#vulnerability-reporting)

To view information on current malware threats please visit:

[www.honeywell.com/us/en/news](http://www.honeywell.com/us/en/news)

OR

Contact your local Honeywell Process Solutions Customer Contact Center (CCC) or our technical support of Elster Gas.

## 12.6 Knowledge base articles on Honeywell Support Portal

Elster Gas provides problem-solving approaches and answers to frequently asked questions, as well as tips and tricks in short articles for various product series in our technical knowledge base.

[process.honeywell.com/us/en/services-and-support/support-center/technical-support](http://process.honeywell.com/us/en/services-and-support/support-center/technical-support)

The knowledge articles are constantly being expanded.

## 12.7 Overview additional manuals

The user documentation consists of the present manual. In case of use additional AFBs, the following AFB manuals are available.



Please note that safety instructions are contained exclusively in the present manual.

Additional Manuals	Q2	proChain
Basic System with SFBs	✓	✓
Gas Quality AFB	–	✓
Modbus AFB	✓	✓
Postprocessing AFB	✓	✓
Update of the Device Software	✓	✓
enSuite - Installation and Security Measures <sup>1</sup>	✓	✓

### 12.7.1 Download latest manuals on Docuthek

Elster Gas provides the user documentation such as manuals, certificates, data sheets, technical information for different device types (in different languages) on the Docuthek. The documents are regularly updated.

[www.docuthek.com](http://www.docuthek.com)

Use the device type as search term, for example,

**enCore FC1**



#### Check PDF after download

Use SHA-1 checksum information to verify the file integrity of a PDF after download with an appropriate tool.

The target value of the SHA-1 checksum for a PDF can be found on our Docuthek in the details in section **Remarks**, or – if you have downloaded the PDF from Honeywell website – in brackets next to the download link.

<sup>1</sup> The current installation instructions are available on the Elster-Instomet website in the **Software Downloads** section.

[process.honeywell.com/us/en/site/elster-instromet/support#software-downloads](http://process.honeywell.com/us/en/site/elster-instromet/support#software-downloads)

**Which manuals are relevant for previous product releases?**

Only the latest manuals are available on the Docuthek. If you are using an older software version, you can look up these manuals for each version in the software history on the Honeywell website. The software history is available as a PDF file for product releases since 2020 in the download area of the respective device type

[process.honeywell.com/us/en/site/elster-instromet/support#software-downloads](https://process.honeywell.com/us/en/site/elster-instromet/support#software-downloads)

## 12.8 How to give feedback to user documentation

We are always interested in your comments, corrections or suggestions for improvement regarding the Elster Gas Flow Computers and Gasanalyzers documentation. Please send your feedback to our technical support of Elster Gas.

[ElsterSupport@Honeywell.com](mailto:ElsterSupport@Honeywell.com)

Use this email address to provide feedback, or to report errors and omissions in the documentation.

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## 14 Glossary

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### A

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#### **Administrator**

Administrator is a person with unrestricted access to the device and responsible for setting and transferring user management to the device. The Administrator should therefore have the appropriate equipment knowledge e.g. by participating in a training course. The station operator usually takes on this task.

#### **Alarm**

Error which jeopardizes the correctness of the results. Generated, for example, if a measurement is outside the defined measuring range. The start and end of an alarm are registered with time stamps in the associated logbook / error list.

#### **Analysis**

is the operating mode in which the device undertakes systematic analyses and is therefore the normal operating state.

#### **Approval file**

is an enSuite file which automatically defines which parameters should be especially protected. It contains approvals for specific countries or standardized settings and relates to all relevant AFBs. An approval file must be used for fiscal purposes, otherwise its use is optional.

#### **Audit trail**

is a two-part log archive (parameter audit trail) which enables the user to conduct changes relevant to billing without opening the SSW. These changes are monitored and documented in the fiscal section. If the SSW is opened, data are only included in the general section.

#### **Authorized metrology expert**

or Fiscal verification officer is a person who has the ability and is authorized, because of his or her technical training, knowledge and experience, to execute fiscally protected tasks in gas systems within the scope of legal metrology. A metrology expert is trained to work with fiscally protected devices and systems and is acquainted with the relevant standards and regulations that apply in specific countries.

### B

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#### **Base calibration**

is a factory adjustment of the device using multiple gases before delivery. It may be repeated by Honeywell if necessary in adjustment procedures.

---

**Basic display**

The basic display is displayed immediately after the device is started. If no operation is performed during a preset time, the device switches back to the basic display automatically. For some device types, it is parameterizable which display is used as basic display.

**Breather**

is a screw-in part (flame arrester) designed to equalize the pressure on explosion-proof housings. This pressure equalization device is required during operation and must not be sealed.

---

**C****C2+**

means that all higher hydrocarbons are added to the ethane component.

**Cable**

To ensure greater differentiation between gas and electrical lines, electrical lines are always referred to as “cables” in the following.

**Calibration gas**

See Operational calibration gas. Also called operational calibration gas, is held in cylinder connected firmly to the device and is part of the measuring system. It is a mixture with fiscal established properties and is required for automatic and manual calibration.

**Calibration officer**

or representative is a person with country-specific authorization who may carry out officially protected work on gas systems which are to be used for fiscal measurements.

**Carbon dioxide (CO<sub>2</sub>)**

An acidic, non-flammable, colorless and odorless gas comprising a chemical compound of carbon and oxygen. The gas is also known as carbonic anhydride or colloquially carbonic acid.

**Checksum**

is a method to identify, display and check the software version. It is calculated by the device itself. Further information about this checking method used by enCore devices is provided in the manual entitled “enCore ZM1, MC1, FC1 – basic system with SFBs”.

**Compressibility factor Z**

The quotient from the actual (real) volume of a specified mass of gas at a specified pressure and temperature and its volume as calculated from the

---

Ideal Gas Law (for the same pressure and temperature). The compressibility factor  $Z$  is generally dependent on the temperature, pressure and gas composition.

### **CSA mark**

The mark shows that the product has been certified by an accredited third-party lab (independent standards organization) and have met applicable standards as required by American law.

### **Current Run time**

The current cycle time restarts with every injection of module (1).

### **Cycle time overrun**

Warning or alarm will be raised, if “Last Run time” is longer than “cycle warning time limit”(e.g. 95s). The warning will disappear, if not valid anymore the alarm not. The user configurable value is in percentage of the total cycle time (default value 1% relative to total cycle time vor warning and 2% relative to total cycle time for alarm)

## **D**

---

### **DBB technology**

is a valve technology to seal gas streams. The connection of 2 solenoid valves in series, between which there is a vent, ensures that the system is safe even if the valves leak.

### **Density/Density at base conditions**

is the quotient of the mass of a gas sample and its volume in specified pressure and temperature conditions or at base conditions, e.g. in  $\text{kg/m}^3$ . The density or density at base conditions is used to monitor the gas composition and energy content of fuel gases.

### **Display**

is the generic term for all depictions and views on the computer and the optional screen.

## **E**

---

### **enCore**

(For short: enCore FC) A collection of various device types used as process computers. These include, for example, the volume conversion device enCore ZM1, the signaling and monitoring unit enCore MC1 and the flow computer enCore FC1. The proChain GC also uses this software package for data management.

**enCore devices**

enCore is the name of the product platform for representatives of a range of measuring devices based on similar modular hardware and software. Their configuration is variable. In addition to the GasLab Q2 and proChain GC, these include the volume conversion device enCore ZM1, the signaling and monitoring unit enCore MC1 and the flow computer enCore FC1.

**enSuite**

The configuration and analysis PC software for current Honeywell Elster devices in the field of flow computer, data storage, gas quality analyzer and ultrasonic gas meter. The software supports all activities that are required for commissioning and maintenance of these devices.

**Error list**

is used by the user to identify errors and reproduce the history of the error. The start and end of a message is entered into the error list with a time stamp and recorded in the logbook.

**Event**

or note is generated if a measurement violates a state defined by the user. The start is entered in the error list with a time stamp and logged in the logbook. Notes cannot be accepted and are automatically deleted from the error list after the cause of the note has ended.

**Export value (enSuite)**

The function blocks in the software supply results which can be processed by other function blocks. These results are known as export values.

**F**

---

**Firmware**

Firmware is software that is functionally fixed to device hardware components. It is embedded or stored in the device and cannot be replaced by the user.

**Fiscal parameters**

are marked with this symbol . They provide information about whether items can be edited when the SSW is locked.

**Fiscal verification officer**

See Authorized metrology expert.

**flow computer**

(For short: enCore FC) A collection of various device types used as process computers. These include, for example, the volume conversion device

---

enCore ZM1, the signaling and monitoring unit enCore MC1 and the flow computer enCore FC1. The proChain GC also uses this software package for data management.

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## G

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### **Gas family**

Classification of fuel gas types into groups based on their physical and combustion properties (families, abbreviated to GF) A distinction is made between 4 gas families. Gas families are classified in Germany in DVGW Code of Practice G 260; natural gas and gas similar to natural gas are members of the second gas family in this system.

### **Gas Quality Analyzers**

are devices which automatically measure the superior calorific value of gases. The superior calorific value, density at base conditions and carbon dioxide content are calculated using the values from the sensors.

### **Gas saturation**

Reflects the influence of water vapor on calorific value/heat value. Values for wet (saturated) gas or partly wet (partially saturated) gas are lower than those for dry (unsaturated) gas because the total volume consists of the components of hydrocarbons and water vapor. The instrument do not analyze water vapor. The determination of the actual water vapor content must, for example, be obtained from moisture or dew point measurements. The results are therefore calculated for three assumed standards (dry/wet /partly wet) of water vapor.

### **Ground loop**

Grounding the devices may create ground loops since the cable screens create additional connections if they are connected to both sides. A ground loop is electric cabling closed to create a loop. In the event of low-frequency error currents, an undesirable voltage drop occurs in the signal path and an interference signal is added to the signal as a result of the impedance of the loop.

### **Grounding**

Grounding is the general term used for the highly conductive connection to a reference potential, for example, to the earth which is also conductive. This device connection is used, among other things, to prevent incoming and outgoing interference as described in the EMC directives and allows various electrical devices and equipment to be operated with a joint reference potential.

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**H**

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**Higher heating value H<sub>s</sub>**

A heat variable used to monitor the gas composition and energy content of fuel gases. The higher heating value can be specified in molar, mass or volume, for example in kWh/m<sup>3</sup>.

**Home**

is a special display and shows the software structure of the device.

---

**I**

---

**Inferior calorific value**

also called net heating value or Lower heating value H<sub>i</sub> (colloquially known as energy content or energy value) is a heat variable. In contrast to the Superior calorific value, the calorific value, all the combustion products are in gaseous which is why this value is lower than the superior calorific value. The value can refer to mole, mass or volume, for example in kWh/m<sup>3</sup>.

**Internal sampling system**

A gas manifold which defines a gas route using valves. The gas channels in this metal block also enable DBB technology to be used.

---

**L**

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**Last Stream Update Time/Date**

Information for the user when the stream last has received an update (new data)

**Limit of detection LOD**

or lower detection limit, LDL is the measured value up to which the measurand can just be reliably detected. Values below the detection limit are referred to as non-measurable or non-detectable in the sense of metrology.

**Limit of quantitation (LOQ)**

is the smallest concentration that can be quantitatively determined with a specified precision. Only above the limit of quantitation quantitative analytical results are given. The limit of quantitation always has a higher accuracy than the limit of detection

**Location of use**

See Place of Use. or of installation is the room or space where the device is placed. It must meet the specified requirements of the manufacturer, authorities, and operators.

---

## Logbook

also known as the standard audit trail, is a log archive which can be used by all software parts and records every extraordinary situation, for example, errors in the measuring equipment.

## Lower heating value Hi

(Colloquially energy content or energy value) is a heat variable. In contrast to the higher heating value, all the combustion products are in gaseous form. Therefore, the higher heating value is higher than the lower heating value. The lower heating value is quoted as a mass-related heating value, for example in kilojoules per kilogram in (kJ/kg) or as the heating value of the gas quantity over the measured volume, for example in building services engineering in kWh/m<sup>3</sup>.

---

## M

### MAC address

The MAC address (Media Access Control) is the unique hardware-bound address of a network component. In enCore devices, the CPU3 board has a LAN interface, each of which has an individual MAC address. The device automatically reads all of the MAC addresses that are present. You can only view the addresses on the device and in enSuite in the Ethernet properties of the respective board ("read-only")

### Main display

is the name of the first display of an AFB or a functionality of the basic system; it shows the most important results of this functionality. Depending on the AFB or functionality, further information is displayed in subordinate device displays.

### Manufacturing Messaging Specification

MMS (pursuant to ISO 9506) allows communication between enSuite and enCore devices.

### Message

is an event which applies to multiple evaluation cycles of the device. It may be reset by a user with the appropriate user rights.

### Modbus protocol

Modbus TCP protocol for data exchange by user-defined registers between AMR and enCore devices using a standard TCP/IP network.

---

## N

### Network Time Protocol.

NTP for the high-precision time synchronization of enCore devices with an NTP time server.

---

**Note**

Generated if a measurement violates a state defined by the user. The start is logged in the logbook.

**O**

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**Operating mode**

Different working states of the device during operation are known as operating modes.

**Operational calibration gas**

short called calibration gas, is kept in a cylinder permanently connected to the device and is an integral part of the instrument. This is a mixture of two or more components e.g. methane and carbon dioxide with officially defined properties and is required for automatic calibration.

**Ordinal number**

or sequence number is an automatically assigned identification number for archived data. This is formed so that the very first archive entry has the number 1. The number is incremented by one for each subsequent entry.

**P**

---

**PELV**

PELV protective extra-low voltage systems which comply with DIN EN 60079-14: the power supply to generate PELVs must ensure that no short-circuit is possible between the primary voltage and the extra-low voltage and its connections. It has a safe electrical isolation point (safety isolation transformer) and complies with IEC 61558-2-6. The circuits are grounded. All bodies of electrical equipment must be connected to a common grounding (and equipotential bonding) system.

**Pipeline**

Pipeline is the 0.5 to >2 m diameter steel pipe. The instrument uses much smaller diameters. The production and installation of tubing is entirely different from pipelines.

**Place of use**

or installation site is the room or position at which the measurement device is located. It must satisfy the requirements defined by the manufacturers, authorities and operators.

**Power-limited circuit**

A power-limited circuit is a circuit separated from other circuits by at least BASIC INSULATION in which the direct voltage (U) is no greater than 60 V.

---

The current which can occur in the circuit is limited by certain measures to a value of less than  $200/U$ . These measures must interrupt the circuit within 120 seconds if this value is exceeded.

**Process gas**

is the gas which is to be analyzed or measured. It is supplied to the measuring equipment in normal operation and is also known as the operating sample gas

**R**

---

**Reference potential**

is a potential to which all other voltages are referred. The potential of a grounded point (ground potential) is used for this purpose and gives it a value of zero volts. Since ground connections, like all connections, have different resistances, voltage differences or potential differences may occur between grounded points and system parts. A correctly designed low resistance equipotential bonding cable between the system parts or devices can eliminate these ground potential differences.

**Remote operation panel**

The enSuite software offers the option of operating the device remotely from the PC during an existing data connection. Once the Remote operation panel action is called up, enSuite displays a operating panel on the computer screen. If a local display exist it is a copy of it, then, the display at the device may show a masked screen preventing the usual operation via keys or touch screen. The on-site user can disconnect the remote operation panel connection at any time and return to the usual device display. The device display shows information on how to do this.

**S**

---

**Security switch (SSW)**

(also known as the CAL switch) is a possible hardware isolator and part of the concept to limit user rights. Since a change requires the housing to be opened, this may only be done by trained personnel with the authorization of the manufacturer.

**SELV**

SELV safety extra-low voltage systems which comply with DIN EN 60079-14: The power supply to generate SELVs must ensure that no short-circuit is possible between the primary voltage and the extra-low voltage and its connections. It has a safe electrical isolation point (safety isolation transformer) and complies with IEC 61558-2-6. Live parts of circuits must not be grounded or connected to live parts or PE wires of other circuits. All

---

bodies of electrical equipment cannot be grounded (for example, for electromagnetic compatibility). (Devices must be grounded even in a SELV system)

**Signal**

is an event which is only output for a short time. Acceptance by the user is not required. Signals are also entered into the logbook.

**Software**

also called application software, is a collective term for programs that determine the function of a device. It can be exchanged or updated by the user.

**Specialist**

or professional is the designation for a trained person who, as a result of their technical training, possesses skills and experience and who is familiar with the relevant standards and regulations. Trained personnel can assess their work and identify potential dangers. Hardware work on the GasLab Q2 or proChain GC requires, among others, the expertise described in EN/IEC 60079-14, Annex A.

**Start delay**

Defines how long the start is delayed after the measuring conditions are reached.

**Status LED**

indicates whether an error, in other words, an alarm or a warning, is active or has been active.

**Stream Info**

Is a text message. It tells the user what the stream is doing e.g. Running / calibrating / verification / manual injection / flushing

**Super user**

shortened (su...) is one of five users who can create or delete further users in the own profile, all five are included in every parameterization and cannot be deleted. The administrator determines the rights of the su and its profile.

**Superior calorific value**

or Higher heating value  $H_s$  also called Upper Calorific value is a heat variable which, for example, is used to monitor the energy content of fuel gases. The superior calorific value is higher than the inferior calorific value. Not all the combustion products are in gaseous form. This value can be specified in molar, mass or volume, for example in kWh/m<sup>3</sup>.

---

**System time**

is the combination of time and date shown on the device. Changing the system time is the generic term for both synchronizing and adjusting these values. Further information is provided in the manual entitled “enCore ZM1, MC1, FC1 – basic system with SFBs”.

---

**T**

---

**Test gas**

See Verification gas

**Time stamp**

are time details which relate to an event. They contain the time in seconds since 1 January 1970, the local time zone and the local time difference (additional deviation in minutes). The format for displaying time stamps depends on the language selected on the device, for example, YYYY-MM-DD hh:mm:ss or DD.MM.YYYY hh:mm:ss.

**Time zone**

Enables the geographic location of the device to be identified. (In Version 3-39 setting only in enSuite offline parameterization)

**Total cycle time**

Fixed time, after a new run will be started. It includes the measurement, cool down, ...everything + spare time to assure that cool down time will be always within Total cycle time. This time assures that the device will measure every 3 minutes for example, independent of the cool down time which will be depending on ambient temperature.

**Total cycle time (Last Run time)**

measured time difference in seconds between the last two injections of module (1) and will change with each cycle. The total cycle time starts with the injection.

**Trained personnel**

See Specialist The designation for a person who, as a result of their technical training, possesses skills and experience and who is familiar with the relevant standards and regulations. Trained personnel can assess their work and identify possible dangers. Hardware work on the device requires, among others, the expertise described in EN/IEC 60079-14, Annex A.

---

**U**

---

**Upper Calorific value**

A thermodynamic parameter that is used, for example, to monitor the energy content of fuel gases. The upper calorific value is greater than the inferior calorific value (net heating value). Not all combustion products are

---

gaseous.

**User**

is a person who belongs to a defined user profile (including super user) and operates or parameterizes the device. The user is identified by a user name and password.

**User management**

Subject to changes by the administrator. If used correctly, it guarantees, by means of passwords and access rights, that unauthorized changes are suppressed and authorized changes are permitted.

**User profile**

is a list of access rights for a group. A super user, for example, SU3, manages the profile with up to 9 other users.

---

**v****Valve block**

is a gas manifold which defines a gas route using valves. The gas channels in this metal block also enable DBB technology to be used.

**Vent gas**

also called waste or exhaust gas, is the gas flowing out of the measuring device after the measurement. The gas from the bypass is also part of the vent gas.

**Verification gas**

A test gas mixture with known properties which is supplied to the measurement device instead of the process gas for verification purposes.

**Virtual private network**

A virtual private network (VPN for short) is a closed logical network in which the participants are physically separated from one another and connected via an IP tunnel.

---

**w****Warning (message or signal)**

Error messages which do not falsify the results but are important for monitoring the measurement. The calculation is continued without falsification. If the cause no longer exists, it can be accepted on the operation panel and the entry thus removed from the error list.

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**WEEE Directive**

The Waste Electrical and Electronic Equipment Directive dated 14 August 2018 is designed to prevent and reduce waste from electrical and electronic equipment, particularly in household waste. It defines minimum standards for handling end-of-life electrical and electronic devices in the EU and relates to all electrical and electronic devices used for private and commercial purposes. To achieve this aim, end-of-life electrical and electronic devices are collected separately and recycled to obtain raw materials.

**Wobbe index  $W_s$** 

Used to characterize the quality of fuel gases and is a calculated variable for monitoring and regulating the heat output. A distinction is made between a superior Wobbe index ( $W_s$ ) and an inferior Wobbe index ( $W_i$ ). The unit is  $J/m^3$  or  $kWh/m^3$ , depending on the unit used for the superior and lower heating value.