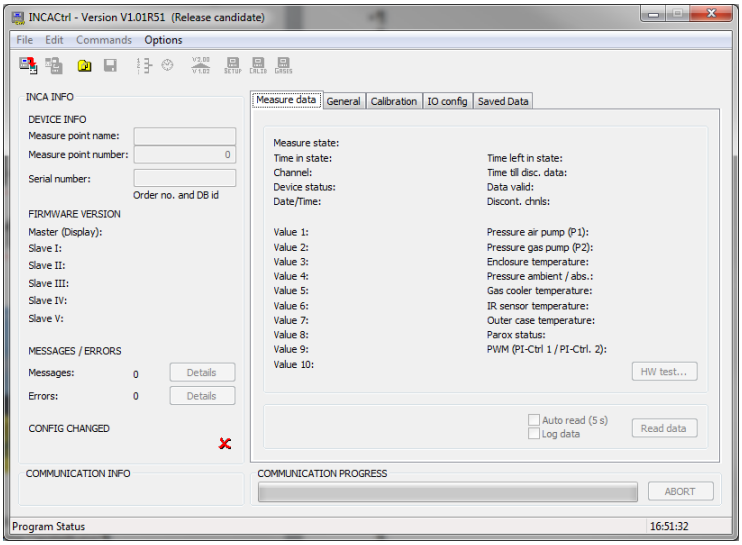
Manual

INCACtrl
device configuration tool



This guide provides information for using the INCACtrl software and its connection to a process gas analyser.

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1 Safety notes

1.1 Warnings and symbols

In the manual, the following names and symbols are used to denote particularly important information:

	DANGER
	Immediate danger that can lead to serious physical injury or death.

	Warning
	Potentially hazardous situations that can lead to serious injury or death.

	ATTENTION
	Potentially hazardous situations that can lead to minor physical injury. This can also be used for property damage.

	**NOTE**
	Denotes information that can make it easier to handle the process gas analyser or help prevent property damage.

2 Preface

2.1 Purpose

INCACtrl is a Microsoft Windows™ program to serve as an interface to communicate with the UNION INCA process gas analyser. The program serves as a configuration tool and allows to

- set device specific configuration data
- set measurement-specific parameter data
- read the current measurement data from the analyser

2.2 Technical requirements

The use of the program requires

- a PC with Microsoft Windows XP, 7 or 8 with an RS232 interface or a USB-to-RS232 converter
- a Null modem cable (for connection to the INCA process gas analyser)
- a USB interface for the remote service module RCM, if necessary

2.3 Changes

The features of the program are subject to constant change without notice. A change list is provided to keep track of the release versions.

2.4 Contact

The program is distributed by UNION Instruments GmbH and its distributors.

Via the following download link

http://www.union-instruments.com/downloads-uebersicht.html

you can download the current INCACtrl software at your own pace.

2.5 Personnel and qualifications

DANGER

Serious risk of injury from exiting gas and Danger from electrical shock!

The operating instructions for the INCA process gas analyser must be observed!

Gas connections and work on the electrical equipment of the INCA process gas analyser may only be performed by a professional while observing safety regulations.

2.6 Safety notes

2.6.1 General safety notes

Warning

The INCA process gas analyser may only be operated when all of the protective equipment is available and operable!

Additional safety notes:

☞ ***Before the corresponding chapters in operating instructions of the process gas analyser!***

2.6.2 Notes on specific hazards

DANGER

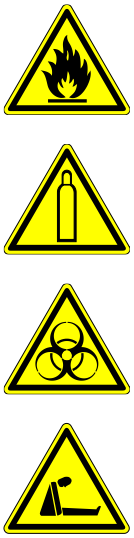
Danger from electrical shock!

Only a trained electrician may modify the electrical equipment of the INCA process gas analyser in accordance with the relevant guidelines!

When the INCA process gas analyser has been opened, the parts identified by the adjacent symbol may still be live even when the master switch has been turned off! If necessary, disconnect the INCA process gas analyser from the power supply!

Warning

- **Leaking process gas can pose a hazard and needs to be discharged by the operator into a safe environment.**
- **After installation, all gas conducting parts must be checked for leaks according to national regulations.**
- **All repairs that require the protective covering to be opened may only be performed by trained personnel.**



Warning

- **Switch off the INCA process gas analyser, and also linked system components if required, before carrying out maintenance work!**

The gas connections may only be established by trained personnel. Follow the applicable guidelines at the installation site.

2.7 Regular technician training

NOTE

Country-specific regulations about regular user training by the technician must be observed, in particular training on handling gases and electrical equipment!

3 Communication setup

3.1 Component

For setting up the communication link and use of the program, the following hardware and software is needed.

- Microsoft Windows
- RS232 interface or USB-to-RS232 converter
- Micro-USB, if RCM installed
- Null modem cable
- UNION Instruments GmbH INCA process gas analyser
- INCACtrl, the current version is required

NOTE

If you have a connection to the remote service module RCM, you will find further information about communication in the document

***Quick start guide INCA – communication*.**

You can download it together with the zip-file *INCA (Pack: Communication)* from the download page of Union Instruments GmbH at your own pace:

http://www.union-instruments.com/downloads-uebersicht.html.

3.2 Technical setup

The INCA process gas analyser is connected to the PC/Notebook using a Null Modem cable.

Fig. 3.1: Connection setup INCA process gas analyser

	**⚠ Attention** **Damage to the device and the system possible!** **If you do not close INCACtrl when changing from one INCA process gas analyser to the next INCA process gas analyser, damage to the configuration of the process gas analysers can occur.** **Before connecting to an INCA process gas analyser, always restart the INCACtrl software.**

If no serial port is available on the PC, use USB-to-RS232 converter.

Fig. 3.2: Optional USB-to-RS232 converter, Digitus

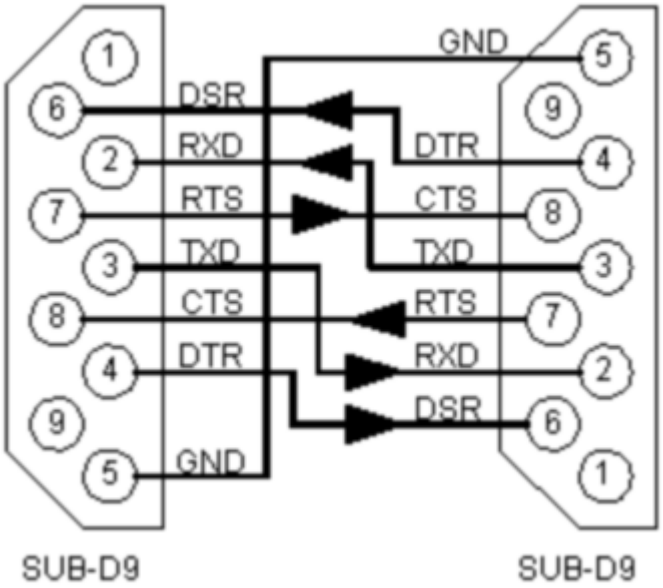


Fig. 3.3: Common Null modem connection

3.2.1 Hardware connection

To set up the hardware link to the INCA process gas analyser, perform the following steps:

1) Open the device enclosure. At the backside of the enclosure door you find the mainboard of the INCA process gas analyser.
2) Connect one end of Null modem cable to the marked connector in **Fig. 3.1**.

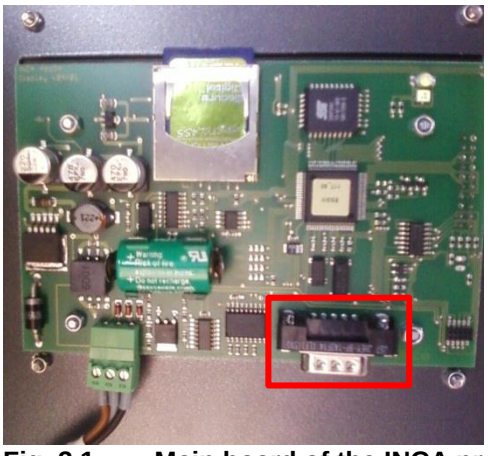


Fig. 3.1: Main board of the INCA process gas analyser

⚠ ATTENTION

Danger of short-circuit!

No galvanic separation of the RS232 interface.

3) Connect the other end of the Null modem cable with your PC/Laptop or the USB-to-RS232 converter.
4) Check if the communication in the INCA process gas analyser is set to ***„INCACtrl“***.
   With the menu buttons on the device you can specify the setting
   MENU → Settings → Communication → INCACtrl.

NOTE

As of firmware version V1.08 (see main dialogue window INCACtrl firmware versions), explicit setup of the communication to INCACtrl is not required any more.

A communication query from INCACtrl is detected automatically, and the Baud rate switches automatically to a transfer rate of 115.2 kbit/s.

4 INCACtrl setup

4.1 Installation

For use of the program, no installation is required. Just copy the executable file **INCACtrl.exe** together with the **CError.h** file into a folder and start it by double clicking the start icon.

NOTE

It might be necessary to install the redistributable package provided by Microsoft for proper use of the program. Before contacting technical support, please install this redistributable package in case the program does not start up.

The redistributable package can be downloaded directly from Microsoft:

http://www.microsoft.com/en-us/download/search.aspx?q=Redistributable+Package

Use the most current version of the redistributable package.

5 INCACtrl Application

5.1 Overview

Note

Always use the latest version of the software INCACtrl – request for latest version!

The precision of the measurements may be affected by unsuitable settings.

INCACtrl is a dialogue-based application. The user can choose the main functions from a menu as well as from a toolbar on the top of the main dialogue. Additional dialogue windows for configuration settings open within the different tabs when you click on available buttons.

The main dialogue window is divided as follows (see **Fig. 5.1**):

- Menu section (program menu)
- Tool bar
- Information section of the INCA process gas analyser
- Tab section with the option to select tabs
- Information section for communication
- Status bar

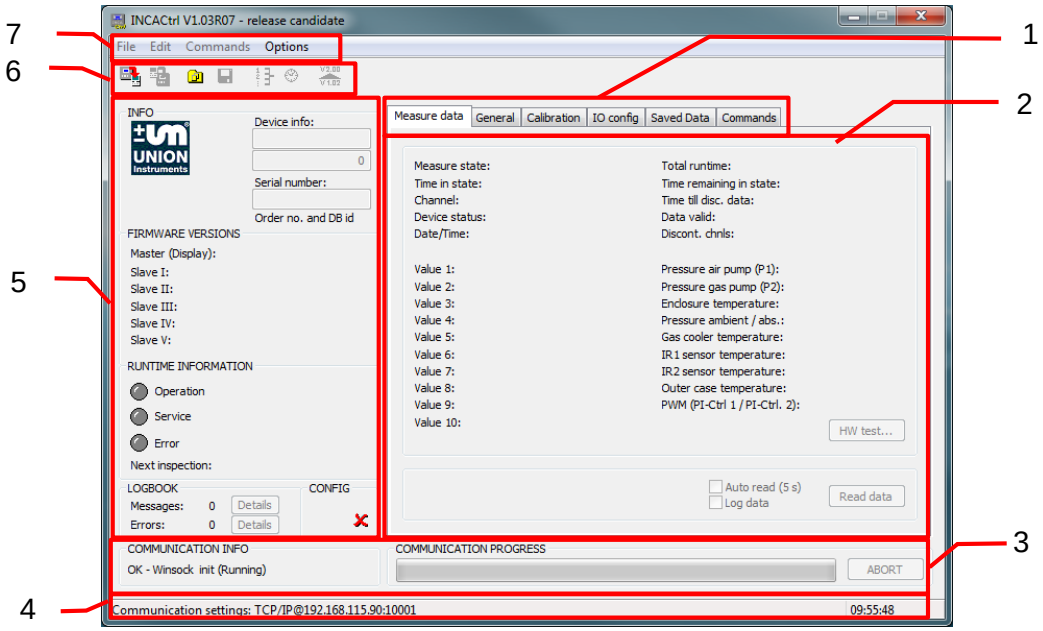


Fig. 5.1: INCACtrl – section in the main dialogue window

1. Selection of the tab
2. Tab "device settings"
3. Communication info section
4. Status bar of the program
5. INCA info section (INFO)
6. Tool bar of the program
7. Program menu

The menu and toolbar control function and commands trigger the communication between ***INCACtrl*** and the INCA process gas analyser.

The ***INFO*** section displays some specific global information of the connected device (see **section** 5.5, **page** 25).

The ***COMMUNICATION INFO*** section displays the status of the communication. If a communication is active, the ABORT button is activated and the user is able to abort a running communication.

The ***status bar*** displays some the main program information. In case of a severe error, the status bar becomes red.

The ***tabs*** contain the main information. Measurement data are displayed; device parameters and settings can be set and changed.

5.2 Connection setup

In order to establish a connection to an INCA process gas analyser, click in the toolbar on the button ***"Read config from INCA"***  .

If an error occurs, check the hardware connection. Make sure that all drivers are installed (e.g. if a USB-to-RS232 converter is used), and try again.

In the Program menu under
Options → Connection Settings
you can open the dialogue window Connection Setup and specify the settings for establishing the connection (see **Fig. 5.2**).

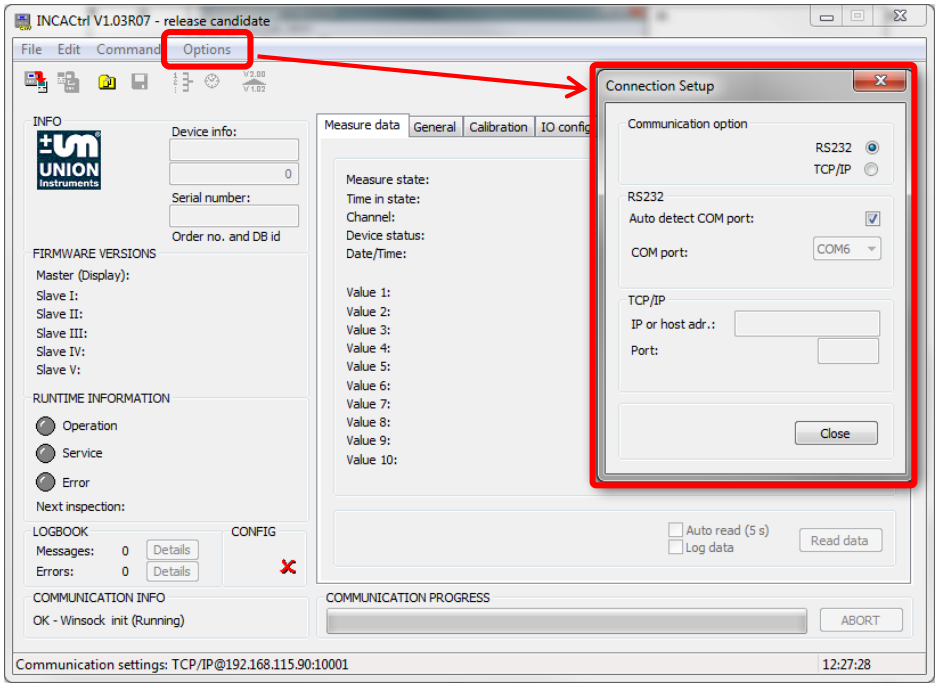


Fig. 5.2: INCACtrl settings for connection setup

Under ***Connection Setup*** you can select RS232 or TCP / IP.

With the selection ***RS232***, you can select the COM port directly or having the corresponding COM port selected automatically by clicking ***Auto detect COM port*** (see **Fig. 5.3**).

Fig. 5.3: COM port settings (RS232)

If you selected ***TCP / IP***, please enter the IO or host address (see **Fig. 5.4**).

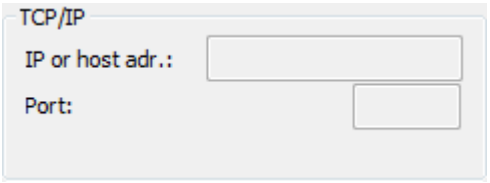


Fig. 5.4: TCP / IP settings

Once connected, ***INCACtrl*** will check if the connected device has the most current firmware installed. If not, it will display a message and ask to upgrade the firmware. Instructions on how to upgrade the firmware can be found under 5.4.7 Firmware Update.

5.2.1 Remote service module RCM (Ethernet, TCP / IP)

There is the option to integrate the INCA process gas analyser into an existing Ehternet network using a ***remote service module RCM.***

	NOTE **A remote service module RCM can be refit in every INCA process gas analyser of version 2 (built approx. as of mid-2010).** **This also requires a firmware update to version V1.08 and at least INCACtrl software version V1.02.**

	NOTE **Further information about communication with the remote service module RCM can be found in document** ***Quick start guide INCA – communication*.** **You can download it together with the zip-file *INCA (Pack: Communication)* from the download page of Union Instruments GmbH at your own pace:** **http://www.union-instruments.com/downloads-uebersicht.html.**

5.3 Start dialogue - Quick Start

When starting up the program for the first time, two buttons are available in the toolbar (see **Fig. 5.5**).

At this time, the INCA process gas analyser should be connected as described earlier before clicking this button. Connection settings are only required for communication by means of the remote service module RCM.
The program scans all available and open COM ports for a connected INCA process gas analyser.

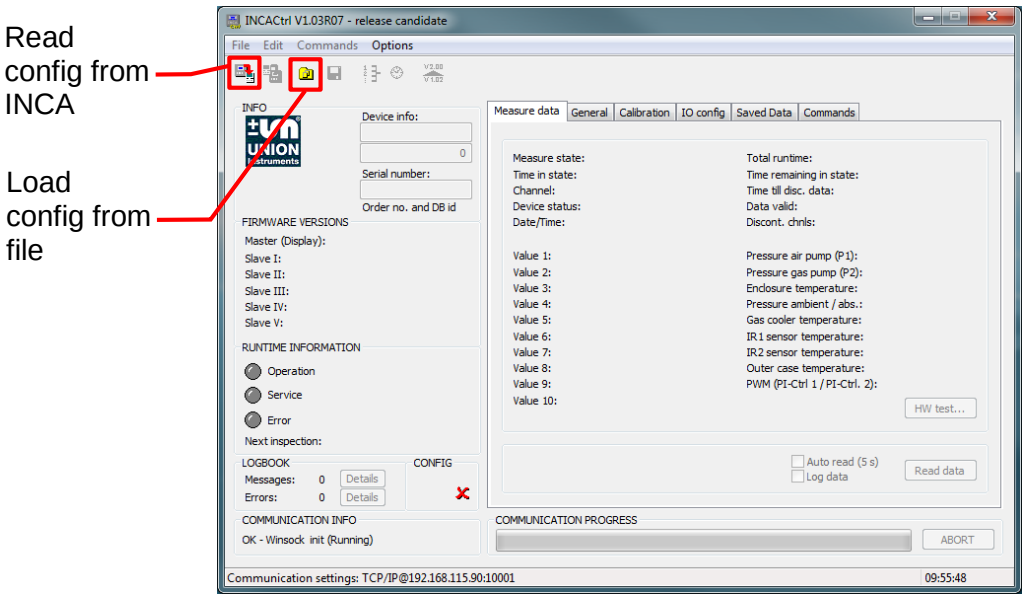


Fig. 5.5: INCACtrl start dialogue window

5.4 Control functions and commands

The following contains a brief description of the control functions and commands (see **Toolbar of the program**, **Fig. 5.5**).

5.4.1 Read config from INCA

With this command you read in all data from the INCA process gas analyser and update them in all dialogue windows.

The icon for this command is  .

NOTE

Any unsaved changes (see section 5.4.2 Write config to INCA) will be deleted after running *Read config from INCA*.

5.4.2 Write config to INCA

With this command you write all changed data to the INCA process gas analyser. All changes take effect immediately.

The icon  in the section ***INCA INFO, Config*** (see **Fig. 5.6**) indicates that data have been changed and do not match the data on the INCA process gas analyser. With ***Write config to INCA*** you transmit the changes to the device.

The icon for this command is  .

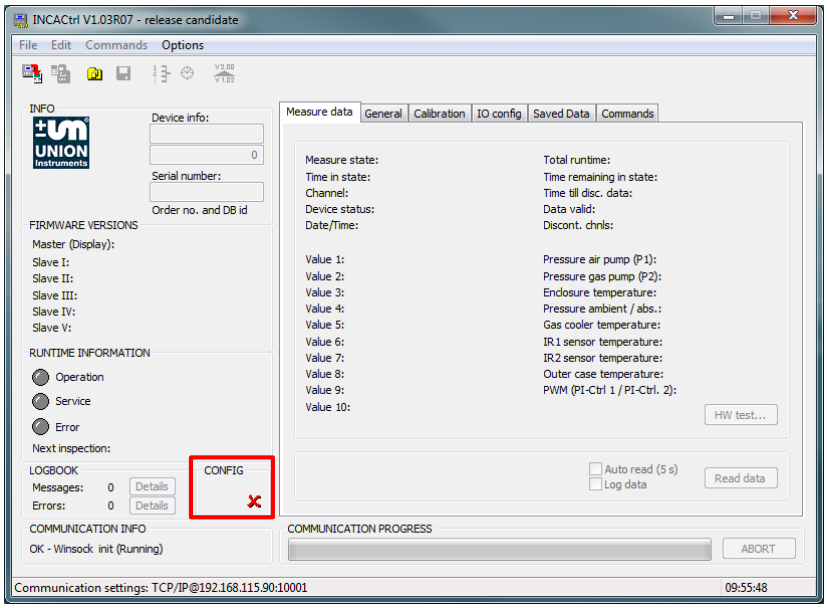


Fig. 5.6: INCA INFO, Config

5.4.3 Load config from file

With this command you can read an INCA configuration file into the software INCACtrl.

The icon for this command is  .

5.4.4 Save config to file

With this command you can save an INCA configuration file on the computer.

The icon for this command is  .

5.4.5 Change channel / measurement point

This command is only available in multi-channel devices (more than one measurement point) and serves to change the measurement point.

The icon for this command is  .

5.4.6 Set time

This command will set the internal clock of the INCA process gas analyser to the system time of the computer.

The icon for this command is  .

5.4.7 Firmware Update

NOTE

Running a firmware update deletes the data (mesurement values) saved in the device!

Therefore save the measurement values before (see section 5.6.5 Saved Data, page 52).

This command allows performing a firmware update of the INCA process gas analyser.

The icon for this command is  .

⚠ Attention

The INCA process gas analyser unit should *never* be turned off while programming a new firmware!

Switching off the device during a firmware update can cause functional restriction up to complete device standstill.

A firmware files consists of the name of the version and the file extension .prg, e. g.

- INCABiogasDispAddOn1xx.prg

Make sure only to upload the correct and approved firmware versions. You can get them either from the UNION Instruments GmbH website as download (http://www.union-instruments.com/downloads-uebersicht.html) or directly from a distributor or support technician.

To start a firmware update click the button 

. A dialogue field appears. Choose the prg-file with the newest version number in its name. Then click ***Open***. The firmware update should then start automatically. By looking at the screen of the process gas analyser unit, the user can verify a running update (see **Fig. 5.7**).

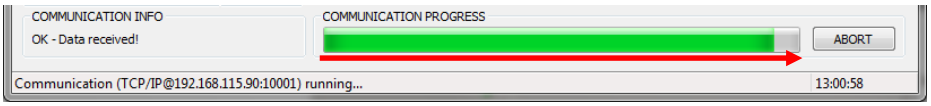


Fig. 5.7: Running firmware update

Once the program is completely stored on the device and checksum verification has been passed, the INCA process gas analyser unit will start programming the new firmware into its program flash.

5.5 Main dialogue window – INCA information section

The ***INFO*** section is a part of the main dialogue window in which important firmware and device data are displayed.

There are five sections within the ***INFO*** section (see **Fig. 5.8**).

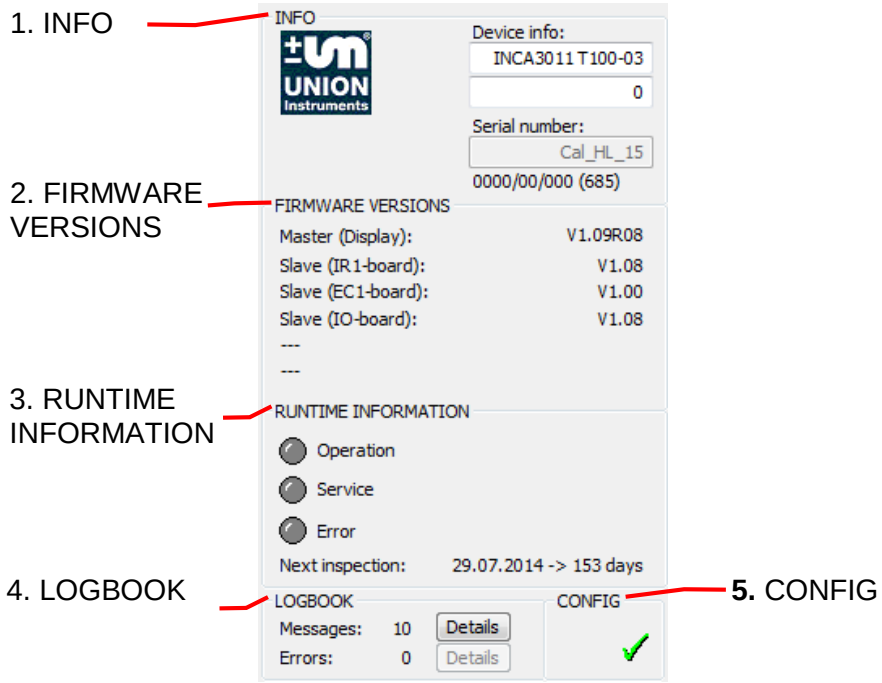


Fig. 5.8: INFO section in the main dialogue window

1. INFO

- ***Device Info:*** device name and type
- ***Serial number:*** INCA serial number

2. FIRMWARE VERSION

- Version of the main board (Master (Display), LCD in the door)
- Version of the slaves (IR 1-, EC 1-, and IO-board)

3. RUNTIME INFORMATION

Display of operating mode:

- ***Operation:*** Normal operating mode
- ***Service:*** Service message pending
- ***Error:*** Error pending

4. LOGBOOK

- Display of errors and messages

NOTE

The file *CError.h* must be stored in the same folder as *INCACtrl.exe* in order to display the descriptions of messages and errors. Else only the error codes of the messages and errors are displayed.

When you display saved messages or errors in the INCA process gas analyser, you can check them in detail by selecting the corresponding button ***Detail***. A window appears (**Message Display** or **Error Display**, see **Fig. 5.9** or **Fig. 5.10**) and displays the corresponding messages / errors with type and date information.

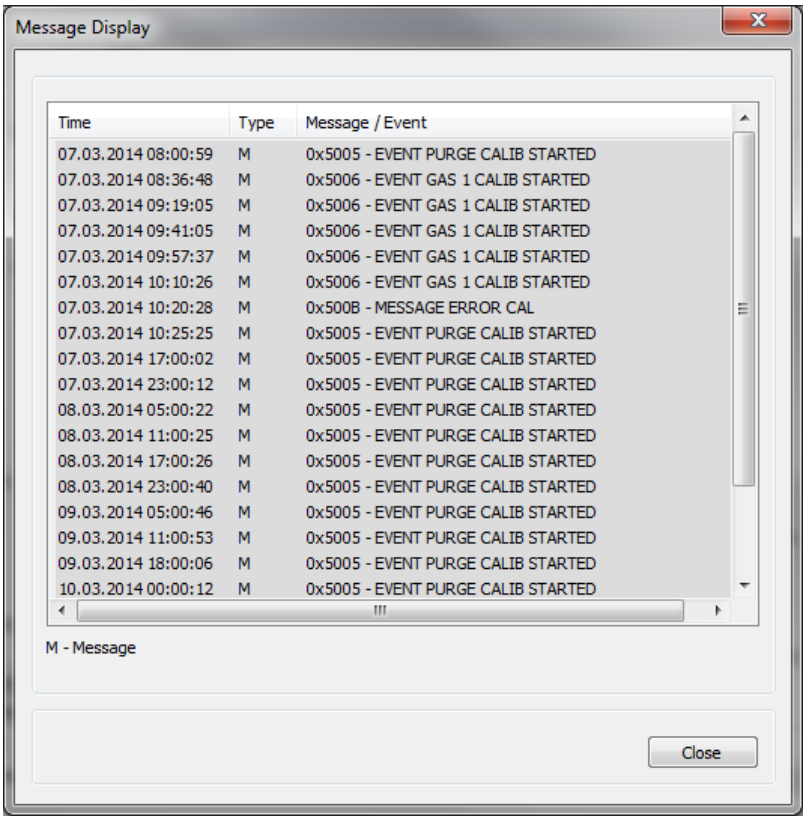


Fig. 5.9: Details for messages

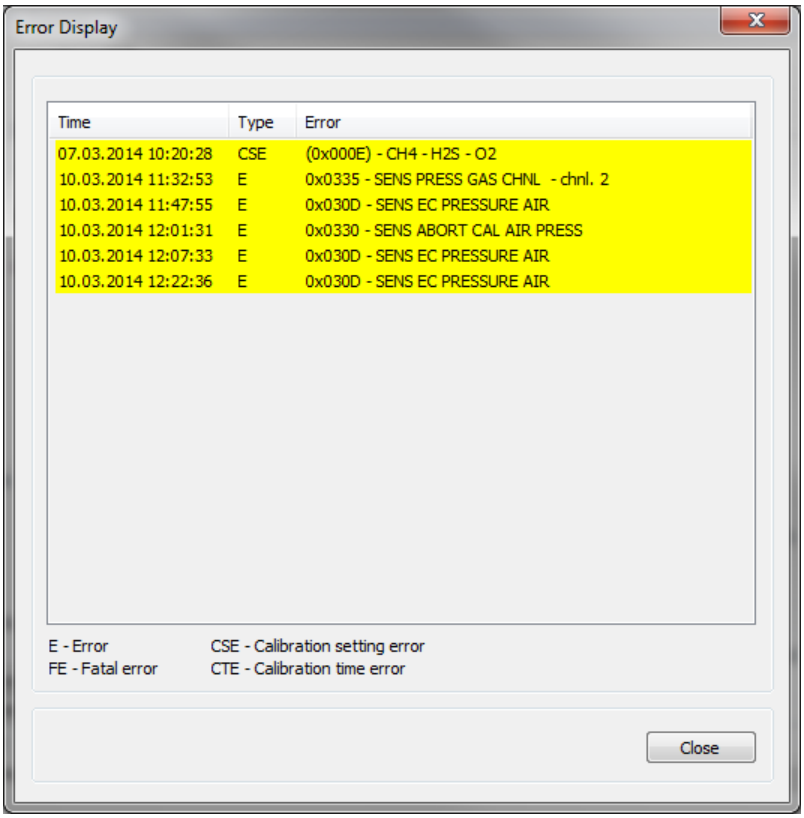


Fig. 5.10: Details for errors

NOTE

For further information about error and service message, refer to the document *Quick guide INCA – error and service messages*.

You can download it together with the zip-file *INCA (Pack: Software/Firmware)* from the download page of Union Instruments GmbH at your own pace:

http://www.union-instruments.com/downloads-uebersicht.html.

5. CONFIG

- Display if data have been changed since last reading out the INCA configuration

  ✓ - no change of configuration data between PC and INCA

  ✗ - configuration data changed on the PC

The displayed data changes tell the user if data on the PC have been changed since the last time they were read out of the device (see **section 5.4.1 Read config from INCA, page 22**). To reset the display to the icon "no change" ✓, you must either write the configuration to the INCA

process gas analyser (see **section 5.4.2 Write config to INCA, page 22**), overwriting the data on the device, or read out the configuration from the analyser again (see **section 5.4.1 Read config from INCA, page 22**), overwriting the data on the PC.

5.6 Tabs, selection and display

The data received by the INCA process gas analyser can be divided into different data categories. They can be configured within the following tabs:

1. **Measure data**

   Display of current measurement data with the option to display the instrument data in intervals or continuously.

2. **General**

   Measurement settings such as cycle timers, pressure and gas cooler settings and further device configurations.

3. **Calibration**

   Calibration setup information, setting of calibration gas composition and calibration cycle timer settings.

4. **IO config**

   Configuration for measurement data output for display and RS232 output. Also setup for analogue and relay outputs.

5. **Saved Data**

   Display of the saved measurement data of the INCA process gas analyser. Also contains the option for data export into a CSV file.

6. **Commands**

   Control of the device. You can start calibration, initiate a device restart and set service mode.

5.6.1 Measure Data

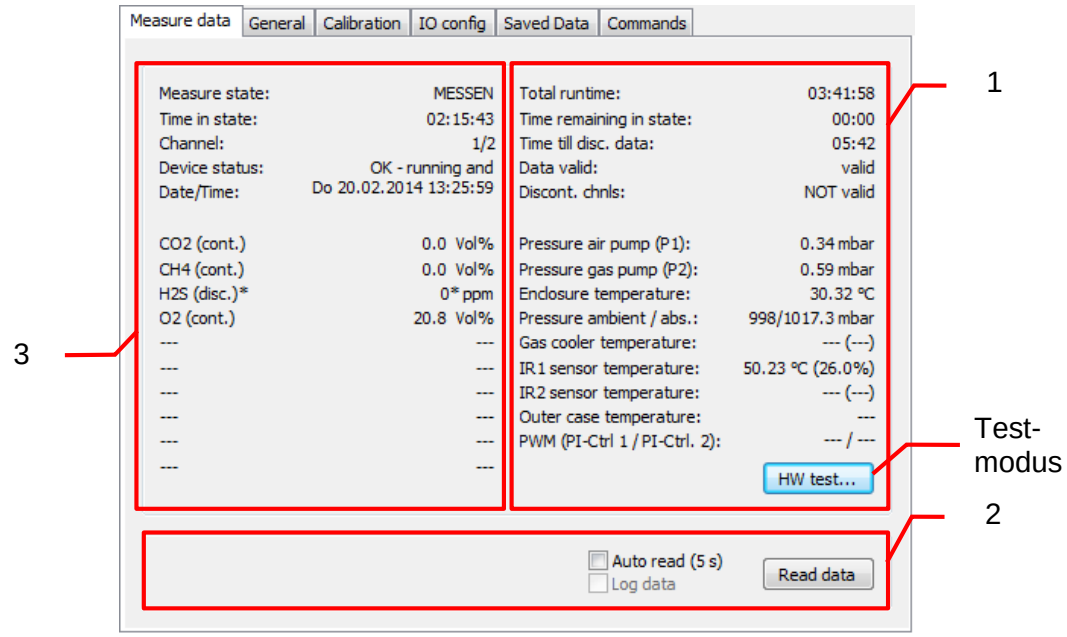


Fig. 5.11: Tab Measure data

1. General information about the measurement cycle as well as information about pump pressure, enclosure temperature and air pressure.
2. Read data
3. Currently displayed values of the analyser with validity flag (acc. to „IO config“)

Data which are marked in orange (see **Fig. 5.12**) are data of an active calibration.

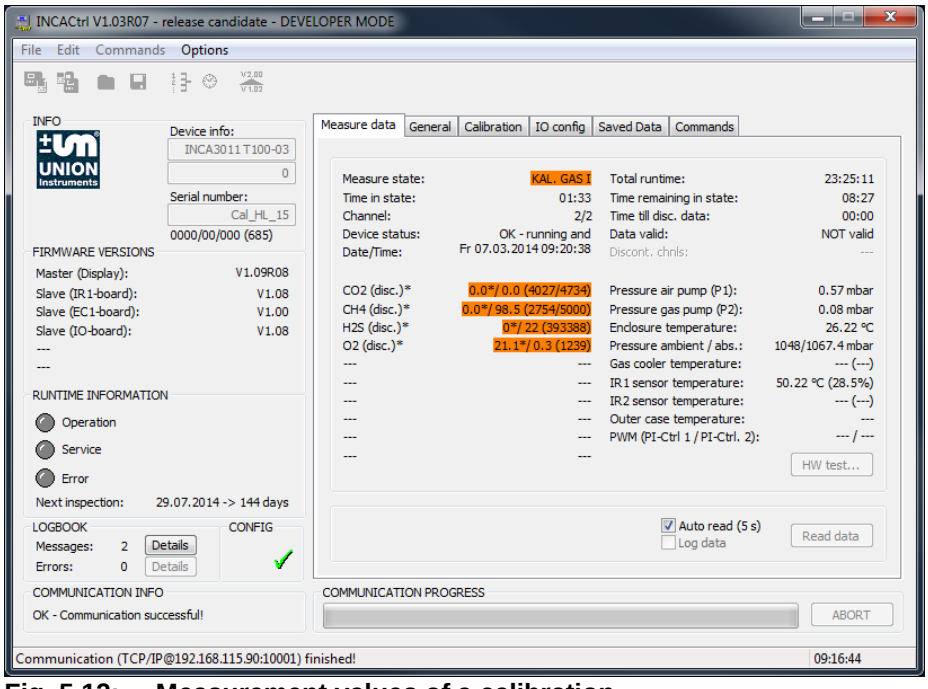


Fig. 5.12: Measurement values of a calibration

1. General information

Display of general information about the measurement cycle as well as information about pump pressure, enclosure temperature and air pressure.

With the button ***HW test...*** you can switch the device into **test mode** (see **Fig. 5.13**). This deactivates the automatic control and you can control the modules manually.

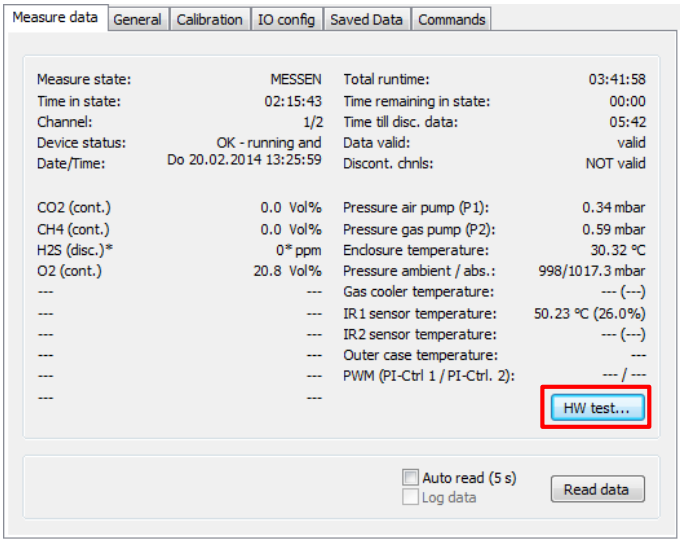


Fig. 5.13: Tab Measure data

NOTE

The test mode is a password-protected function and can only be activated by specifically trained personnel.

2. Read data

With the button ***Read data*** you can read frame-specific data manually (see **Fig. 5.14**). Once the data are read in, the dialogue window is automatically updated.

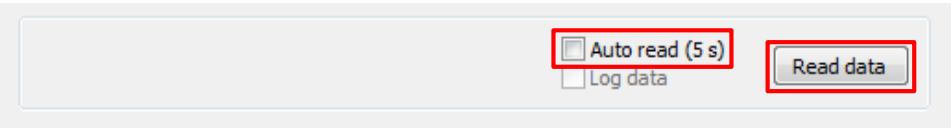


Fig. 5.14: Reading the data with Read data / Auto read (5 s)

If you select ***Auto read (5 s)***, the data in the tab are automatically read and displayed every 5 seconds. This enables comfortable reading of the data on the PC. The user does not need to view the display on the INCA process gas analyser and browse through different screen contents.

NOTE

If the option *Auto Read (5s)* is active, you cannot configure the INCA process gas analyser.

This option is used for automatic update of the information.

3. **Current values**

   Currently displayed values of the analyser with validity flag (acc. to „IO config“).

5.6.2 General

In the General tab, you can configure general settings for the measurements with the INCA process gas analyser.

Depending on device type (***continuous / discontinuous measurement***), the display on this tab and the configuration options vary.

In both cases, the tab is divided into three sections (see **Fig. 5.15 a**nd **Fig. 5.16**):

- Hardware Setting
- Device Setting
- Measure Cycle Timer

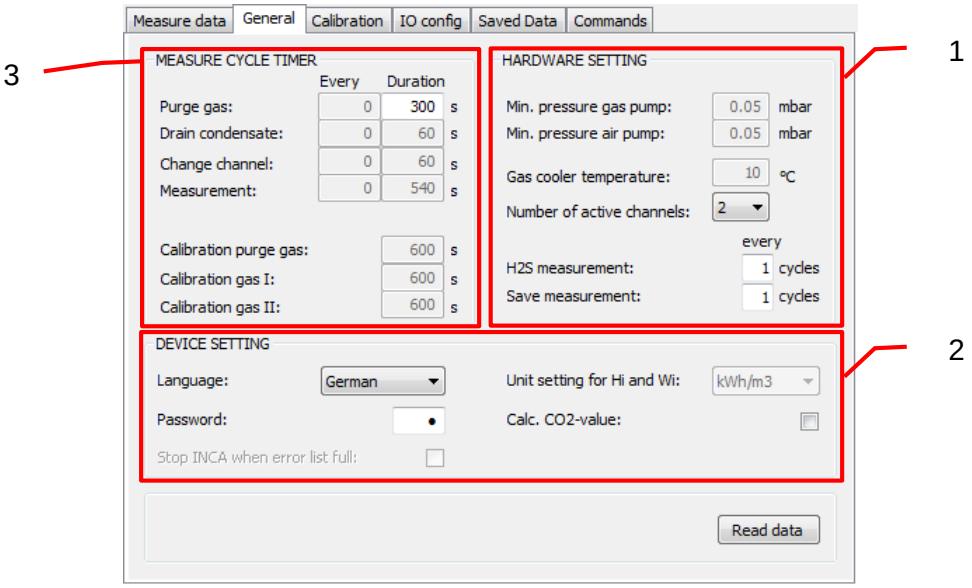


Fig. 5.15: Tab General, discontinuous measurement

1. Hardware Setting
2. Device Setting
3. Measure Cycle Timer

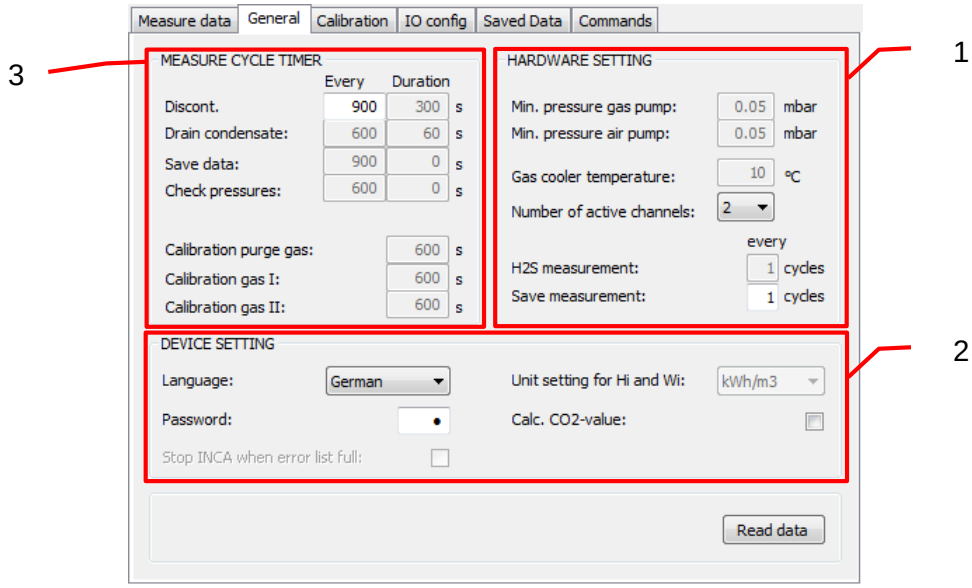


Fig. 5.16: Tab General, continuous measurement

1. Hardware Setting
2. Device Setting
3. Measure Cycle Timer

1. Hardware Setting

In this section you can configure different hardware specific settings.

- ***Min. pressure gas pump***
  Determines the threshold that triggers an error if the pump pressure at the end of a Change channel cycle (discontinuous measurement) or after Check pressure (continuous measurement) is below the set value.
- ***Min. pressure air pump***
  Determines the threshold that triggers an error if the pump pressure at the end of a Change channel cycle (discontinuous measurement) or after Check pressure (continuous measurement) is below the set value.
- ***Gas cooler temperature***
  If a gas cooler is installed, the temperature of the gas cooler is set to this value.

NOTE

The options

- **Min. pressure gas pump**
- **Min. pressure air pump**
- **Gas cooler temperature**

are password-protected factory settings and can only be edited by developers of UNION Instruments GmbH.

- ***Number of active channels***
  In multi-channel devices, you can select the number of active channels here. If only one measurement channel is available, no change is possible.
- ***H2S measurement***
  To increase the lifetime of electrochemical (EC) sensors, you can specify only to measure every x measurement cycle using the EC sensors. If the value is set to 1, every cycle an EC measurement is performed as well. If the value is higher than 1, then the data from the last measured cycle is used to display values and output data. This option is only enabled and activated for µPulse™ EC-sensors (such as the H_2S sensor).
- ***Save measurement***
  In a continuous measurement, the customer can specify with this option after which number of cycles the measurement values are saved. Entering 1 means that the data are saved after each cycle.

	⚠ Attention
	If both *H2S measurement* and *Save measurement* are e. g. set to 4 cycles (see section 5.6.2 General, page 32), it is not sure that the current measurement value is displayed because these two functions are *not synchronised*.

2. Device Setting

	**NOTE**
	The options • **Stop INCA when error list full** • **Unit setting for Hi and Wi** **are password-protected factory settings and can only be edited by developers of UNION Instruments GmbH.**

- ***Language***
  Sets the language on the display of the INCA process gas analyser
- ***Password***
  Here the user can specify a password to prevent input directly on the device.
  The password is considered active if a value higher than zero is entered and written to the instrument. Values from 1 – 9999 are possible. The system can still be configured via the PC with this option.

NOTE

Forgot your password?

By entering *0* you can reset the password.

- ***Calc. CO2-value***
  Activates the CO_2 scaling, no directly measured CO_2 value is displayed. The CO_2 value is derived from the other measured parameters (CH_4, H_2S, O_2, H_2).
  After activating this function, the changed configuration must be transferred to the device using "Write config to INCA".

NOTE

The option Calc. CO2-value is only enabled if a CO_2 sensor is installed in the INCA process gas analyser.

3. Measure Cycle Timer

This section serves to set the timer values of the different cycles for the running system. The time (in seconds) defines how long the INCA process gas analyser will last in the state before moving on. For an explanation of the states, please see the INCA process gas analyser device manual.

NOTE

Depending on device type (*continuous / discontinuous measurement mode*), the configuration options of the two measurements types vary (see Table 1).

Table 1 lists the configuration options for the continuous and the discontinuous measurement mode.

The marker „•“ indicates a factory setting which can not be configured by the user.

Settings with ✓ can be configured by the user.

Options marked with „–“ are not present in the respective measurement mode.

Measurement mode / Function / Option	Continuous	Discontinuous
Purge gas (Spülgas)	–	✓ (Duration)
Discont.	✓ (Every)	–
Drain condensate	●	●
Channel change	–	●
Save data	●	–
Measurement	–	●
Check pressure	●	●
Calibration purge gas, gas I, gas II	●	●

Table 1 Configuration options in continuous or discontinuous measurement mode

- ***Purge gas***
  Purge gas (air) is pumped through the system to clean out the system from process gas of the previous measurement. The user can set the duration of this cycle.
- ***Discont.***
  Measurement of H_2 and H_2S can only be done in the discontinuous process.
  Thus, with a device type with continuous measurement mode the user can specify the cycle when H_2 and H_2S are to be measured. The duration of the measurement is a password-protected setting and can only be configured by the developers of Union Instruments GmbH.
- ***Drain condensate***
  If the system has a gas cooler, the pump will run during that cycle to drain the condensate from the gas cooler.
- ***Channel change***
  The system starts and guides the process gas of the active channel through the system. This allows the pumps to build up pressure and the process gas can reach the sensors before the measurement is started. At the end of this cycle the pressure of the gas pump and air pump is checked and if either one is below its minimum set pressure, an error is generated and stored in the error list.
- ***Save data***
  Duration after which the measurement values are present and can be saved.
- ***Measurement***
  Cycle in which the measurement is performed with the current set channel. The display times and output times of the measured values can be adjusted in the tab “IO config”. At the end of this cycle, the measurement data are stored and can also be displayed until the next measurement cycle has finished.
- ***Check pressure***
  Cycle after which the pressure is checked.

- ***Calibration purge, gas I und gas II***
  To set the duration of a calibration with the specified gas. A calibration can be set up to start either automatically or manually through the display menu commands.

5.6.3 Calibration

In the tab Calibration the user can set up the INCA process gas analyser for automatic or manual calibration with the purge gas (usually air and/or a calibration gas). Depending on the device type, there can be an option to add another calibration gas. For a calibration three basic steps need to be done:

1) Edit the gas composition of the gas (gas and concentration)
2) Edit the calibration settings for the gas (Zero point, end point (Span) and centre (Mid/Mixer).

NOTE

When performing a calibration, the following order must be observed:

1. **Zero calibration**
2. **End point calibration (Span)**
3. **Centre point calibration (Mid/Mixer)**

If you do not adhere to this order, the error *Erro Cal. Time* can occur!

For a more specific description of the error, refer to the document

Quick guide INCA – error and service messages

.

(http://www.union-instruments.com/downloads-uebersicht.html, zip-file *INCA (Pack: Software/Firmware)*)

3) Start the calibration manually (command in the screen menu or in tab Commands in INCACtrl) or automatically (configurable with INCACtrl).

You perform the first two steps in the section ***GAS COMPOSITION AND CALIBRATION SETTING***, the third step can be configured under ***CALIBRATION INTERVALS*** (see **Fig. 5.17**).

NOTE

When connecting the calibration gas, make sure that the possible maximum pressure at the input calibration gas 1 is not exceeded and that the gas bottle is opened.

The *maximum pressure* is listed on the label at the gas inlet. If no value is specified, the calibration gas may be connected with a maximum pressure of 20 mbar.

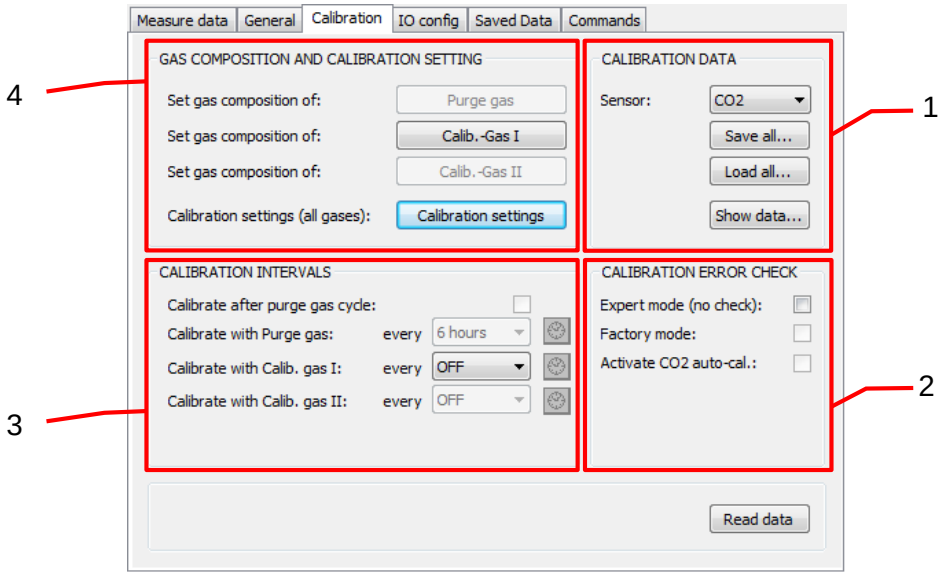


Fig. 5.17: Calibration tab frame

1. Calibration Data
2. Calibration Error Check
3. Calibration Intervals
4. Gas Composition and Calibration Setting

The button ***Read Data*** is designed for factory settings only.

NOTE

If errors or faults occur during calibration, you can find a more specific description of the error in the document

***Quick guide INCA – error and service messages*.**

You can download it together with the zip-file *INCA (Pack: Software/Firmware)* from the download page of Union Instruments GmbH at your own pace:

http://www.union-instruments.com/downloads-uebersicht.html.

1. Calibration Data

After selecting a sensor, the actually calibration data can be viewed via the button ***Show data*** (see **Fig. 5.18**).

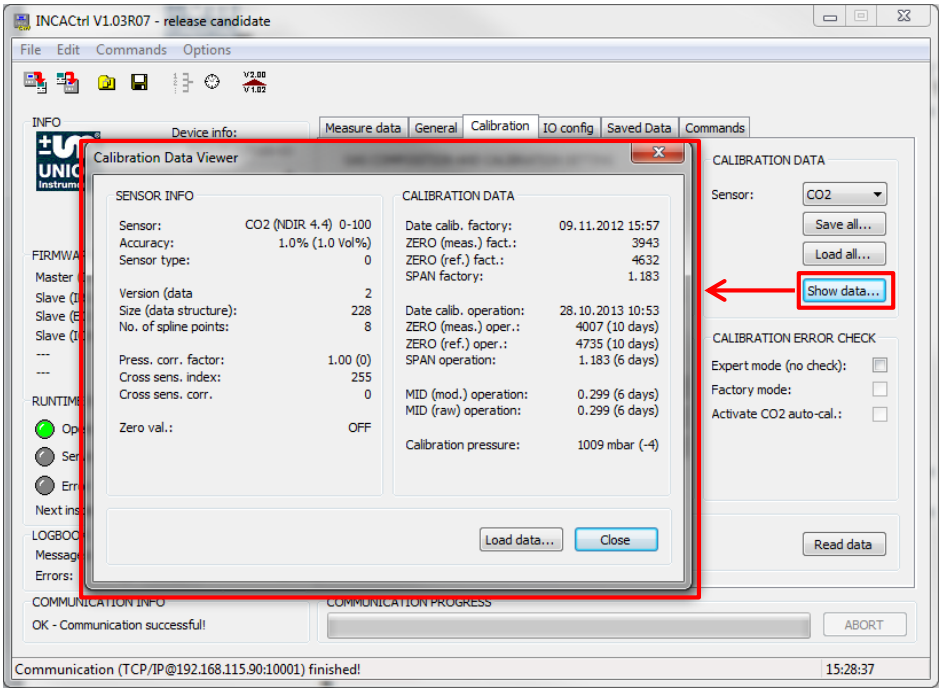


Fig. 5.18: Calibration Data, Show data

With the button ***Save all*** you can save the calibration data of all sensors in one file.

With the button ***Load all*** you can read the saved calibration data from a file into INCACtrl. You can then view the loaded calibration data, a transfer to the INCA process gas analyser is not possible.

2. Calibration Error Check

	NOTE
	The options • **Factory mode** • **Activate CO2 auto-cal.** **are password-protected factory settings and can only be edited by developers of UNION Instruments GmbH.**

- **Expert mode (no check)**
  By ***activating*** the option ***Expert mode (no check)***, the settings of the calibration actions are not monitored by the software. In case of strong deviation of the measured gas concentration from the rated value, the calibration points are set nonetheless.

The selection of the calibration points in the dialogue window ***Calibration Setting*** (see **Fig. 5.21, page 43**) is not limited, i.e. the use can select the respective calibration points of the gases. But only one calibration point can be set per gas.

NOTE

If the option

- **Expert mode (no check)**

is activated, there is a risk of *faulty calibrations*!

Output of correct measurement values can then no longer be ensured!

If ***Expert mode (no check)*** is ***deactivated***, the possible calibration points of the gases are firmly specified. The user can only select one calibration point per gas so that faulty calibration is not possible.

NOTE

In a calibration, the rated and the actual values are compared.

If the deviation is too large, the *error Error cal. set* occurs.

3. Calibration Intervals

- **Calibrate after purge gas cycle**
  If this checkbox is marked, a purge gas calibration is done automatically after each purge gas cycle in normal measurement mode.
  With this setting, the sensors can be set to 0 after each measurement cycle or the end point for O_2 can be specified.
- **Calibrate with Gas I**
  This option sets up an automatic calibration for the INCA process gas analyser. If this is activated a calibration with gas I is performed automatically in the set time intervals.
  In addition, the user can select the time for calibration using the button in the dialogue window **Calibration Time Setting**. With an hourly interval (X hours), minutes can be set as the time, with daily interval (X days) the hour and minute and in case of a weekly interval (X weeks) the day of week, hour and minute. The options are listed in **Table 2, page 41**.

Time setting / Interval	Minute	Stunde	Tag
hour	X		
days	X	X	
weekly	X	X	X

Table 2 Setting options for time of calibration, Calibration Time Setting

Fig. 5.19 shows an example for a weekly interval. The calibration with the calibration gas Calib. I is done every Monday at 15:25 h.

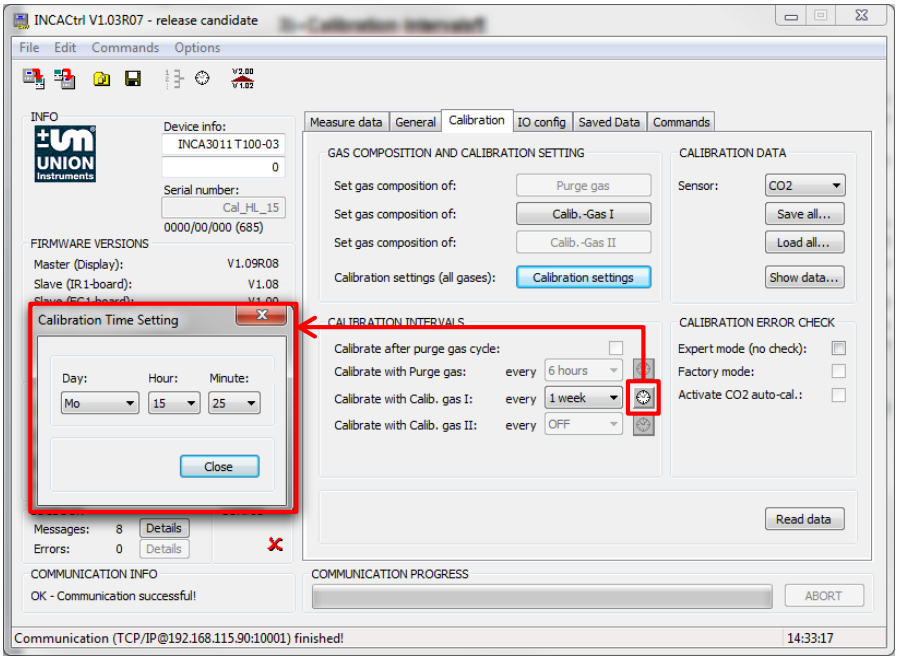


Fig. 5.19: Calibration Time Setting, time of calibration

- **Calibrate with Gas II**
  Identical to Calibrate with Gas I, but not given with every device type.

NOTE

The options

- **Calibrate after purge gas cycle**
- **Calibrate with Purge gas**

are password-protected and can only be configured by developers of UNION Instruments GmbH.

4. Gas composition and Calibration setting

	NOTE
	Calib.-Gas II is an option for INCA process gas analysers with an additional calibration gas inlet. **The option** • **Purge gas** **is password-protected and can only be configured by developers of UNION Instruments GmbH.**

- **Calib.-Gas I, Calib.-Gas II**
  Here you can set the gas composition of the selected gas. An additional dialogue window will open automatically.
  In this dialogue window, the user must enter the **Actual values (values on the gas certificate)** of the gas composition of the selected gas of the mixed gas (see **Fig. 5.20**).

	NOTE
	Note on entering: **The gas concentration must be entered using a decimal point.** **Example:** ***20.9***

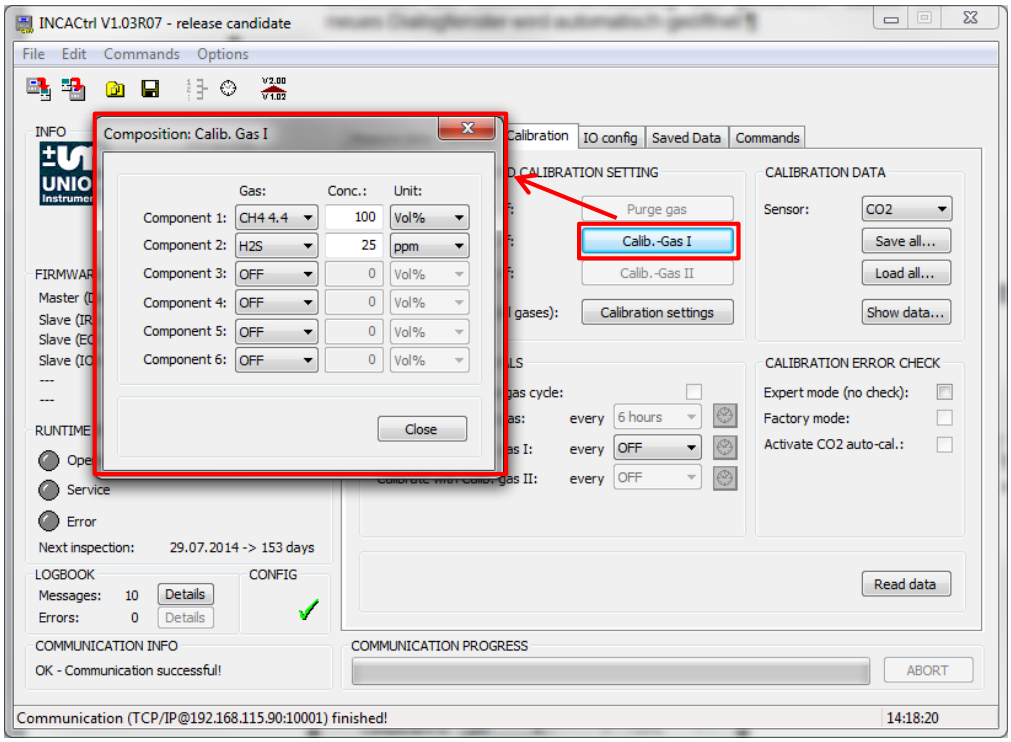


Fig. 5.20: Dialogue window Composition Calib. Gas I (using the example mixed gas CH_4 and H_2S, purity 3.5)

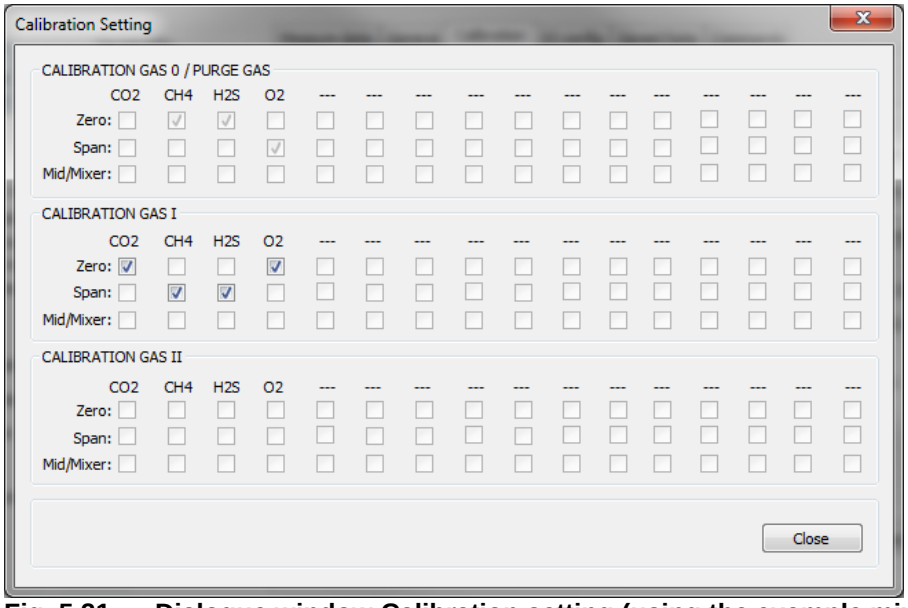


Fig. 5.21: Dialogue window Calibration setting (using the example mixed gas CH_4 and H_2S, purity 3.5)

Fig. 5.21 shown an example for the settings of a calibration with CH_4 and H_2S. When the calibration starts, the system calibrates zero points (Zero) for CO_2 and O_2 and end oints (Span) for CH_4 and H_2S at the end of the calibration cycle.

NOTE

Only one checkbox for each gas and calibration type can be checked. A simultaneous calibration of zero (Zero), end (Span) and centre point for one gas (e. g. purge gas) is not possible.

A running calibration can be interrupted or stopped any time. To do so, select the command Abort calibration in the screen menu at the device or go to tab Commands and click the button Abort calibration (see **Fig. 5.22**).

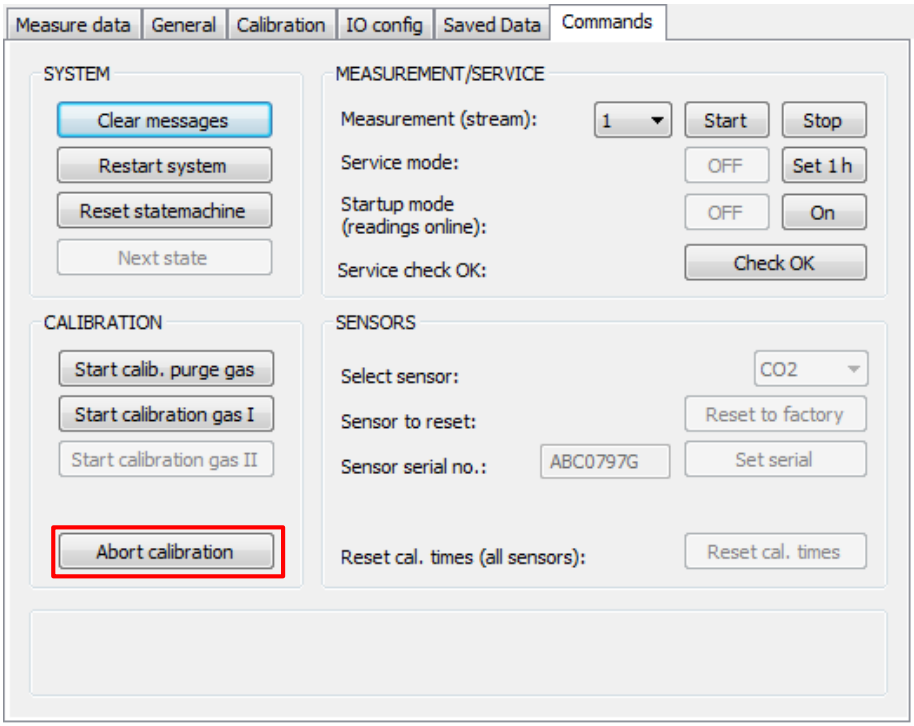


Fig. 5.22: Cancelling a calibration in the tab Commands

5.6.4 Tab IO Config

Within this tab frame the possible data output options of the INCA process gas analyser can be configured.

The tab is divided into three sections (see **Fig. 5.23**)

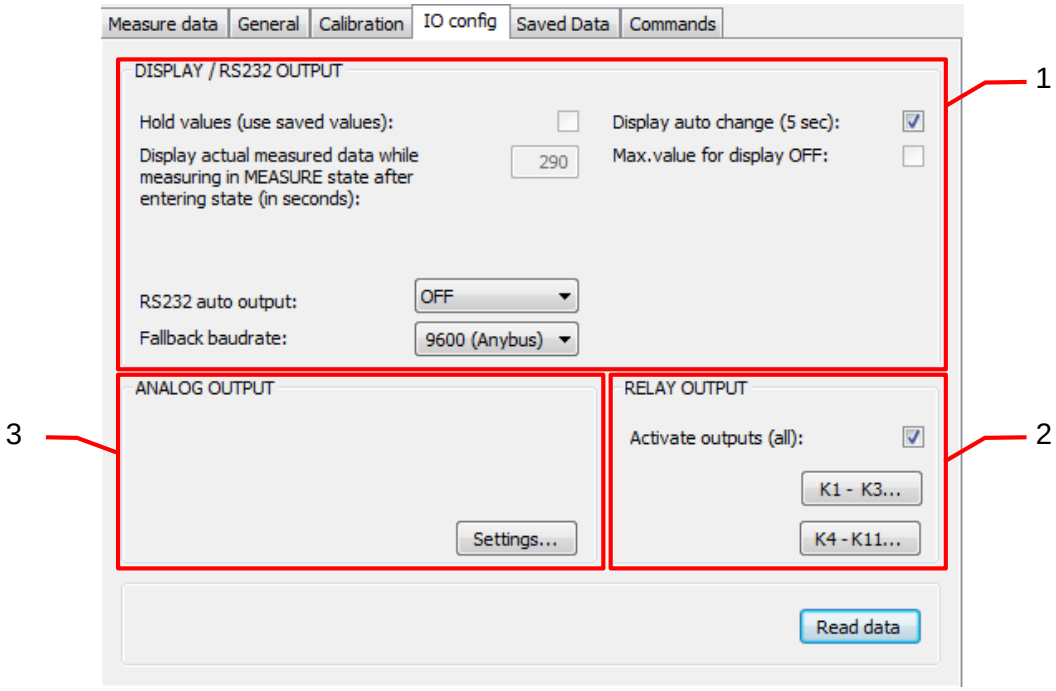


Fig. 5.23: Tab IO Config

1. Display / RS232 Output
2. Relay Output
3. Analog Output

1. Display / RS232 output

Here you can configure the data output on the display and the RS232 output. The data of these two outputs is always the same.

	**NOTE** **For detailed information about the connection and communication with the INCA process gas analyser refer to the document** ***Quick start guide INCA – communication*.** **You can download it together with the zip-file *INCA (Pack: Communication)* from the download page of Union Instruments GmbH at your own pace:** **http://www.union-instruments.com/downloads-uebersicht.html.**

- ***Hold values (use saved values)***
  only for factory settings.

- ***Display actual measured data while measuring***
  only for factory settings.
- ***Display auto change (5 sec)***
  The display content on the INCA process gas analyser changes every 5 seconds
- ***Max. Value for Display OFF***
  only for factory settings.
- ***RS232 auto output:***
  Activates the output of the currently measured data and system information through the RS232 interface. If activated, the data are sent every 15 seconds. Deactivated (***OFF***) is the default setting.
  An optionally available Profibus module can make these data available in a Profibus system, or else the data are directly interpreted by reception and analysis. A separate document is available for interpretation (see document Quick guide INCA communication).
- ***Fallback baudrate***
  Setting to reduce the transfer rate to a speed that ensures error-free reception.

2. RELAY OUTPUT

Relay output can be configured in this scope.

A **relay (electric)** is a switch with two positions. The relay is activated by a control circuit and can switch other circuits.

The possible commands (see **Trigger type Fig. 5.25, page** 50), which can be set via the software INCACtrl, are listed in **Table 3** below with a short description.

Command (Trigger type)	Meaning / Description
OFF	Relay has no function.
Alarm – low gas value	Active if it falls below the set alarm threshold for the gas concentration (e.g. CH_4 < 47 Vol%). This relay function can be set channel-specific.
Alarm – high gas value	Active if it exceeds the set alarm threshold for the gas concentration (e.g. O_2 > 3 Vol%). This relay function can be set channel-specific.
Error list full	Active if the error and message list is full (40 errors). Older errors are then always deleted when a new error occurs.
INCA calibrating	Active if calibration active (purge gas), Calib.-gas 1 and Calib.-gas 2 (Calib.-Gas 1 / Gas 2).

Command (Trigger type)	Meaning / Description
Internal case temp. above	Active if the inner temperature of the enclosure exceeds the set threshold value.
Internal case temp. below	Active if the inner temperature of the enclosure falls below the set threshold value.
INCA operation	Active if the INCA process gas analyser is in operation mode (no error, no warmup).
INCA failure	Active if the INCA process gas analyser has a fatal error and the measurement procedure is stopped.
Service request 1	Active if one of the set service requests takes place. → Dialogue window ***Service-Request setting*** (see **Fig. 5.26, *page*** 50).
Service request 2	Active if one of the set service requests takes place. → Dialogue window ***Service-Request setting***.
Measure data valid	Active if measurement data on mA-outputs, on the display and on the field bus are „online“ or being updated with new data. Only active if both discontinuous and continuous measurement parameters are online. This relay function can be set channel-specific.
EC measurement started	Active if discontinuous EC measurement is active and measuring.
PI-control temp. 1 (PMW)	PI-contoller 1 (e. g. for a heater control)
PI-control temp. 2 (PMW)	PI-contoller 2 (e. g. for a heater control)
Channel valve active	Active if the valve of a specific channel is open. This relay function can be set channel-specific.

Command (Trigger type)	Meaning / Description
Error (fatal, device, cal., service)	Active of service and / or service messages of type • global error • device error, sensor error • calibration error • service request are pending. (see Quick guide INCA – error and service messages)
Error (device, cal., service)	Active of service and / or service messages of type • device error, sensor error • calibration error • service request are pending. (see Quick guide INCA – error and service messages)
Error (cal., service)	Active of service and / or service messages of type • calibration error • service request are pending. (see Quick guide INCA – error and service messages)
Error (device)	Active of service and / or service messages of type • device error, sensor error are pending. (see Quick guide INCA – error and service messages)
Online data (cont. readings)	Active if measurement data on mA-outputs, on the display and on the field bus are „online“ or being updated with new data. (only continuously measuring measurement parameters, see type plate) This relay function can be set channel-specific.

Command (Trigger type)	Meaning / Description
Online data (discont. readings)	Active if measurement data on mA-outputs, on the display and on the field bus are „online“ or being updated with new data. (only discontinuously measuring measurement parameters, see type plate) This relay function can be set channel-specific.

Table 3 Settings for relay functions, Trigger type

- ***Activate outputs (all)***
  So far only two relays are active.
  Relay 1: is set if the INCA process gas analyser is running (after the warm-up phase)
  Relay 2: is set if a fatal error occurred
  Relay 3: configurable output
- ***K1 – K3***
  The menu ***Relay Settings*** offers customized configuration of the three digital outputs (see **Fig. 5.24**).
  The available commands (**Trigger type**, see **Fig. 5.25, page 50**) are listed in **Table 3, page 49**.

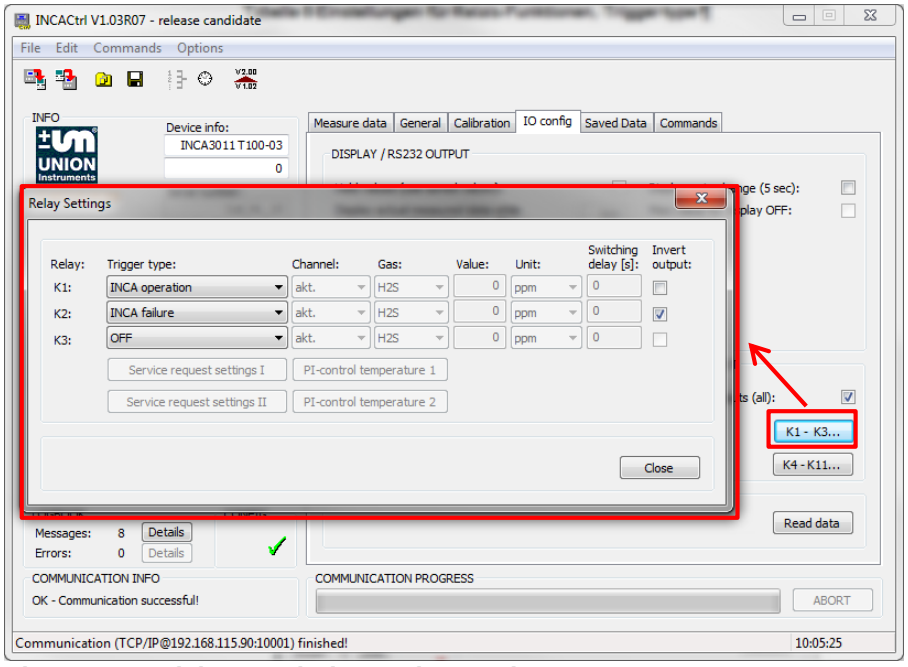


Fig. 5.24: Dialogue window Relay Settings

NOTE

Relays K1 and K2 are pre-configured by factory settings and can be configured freely.

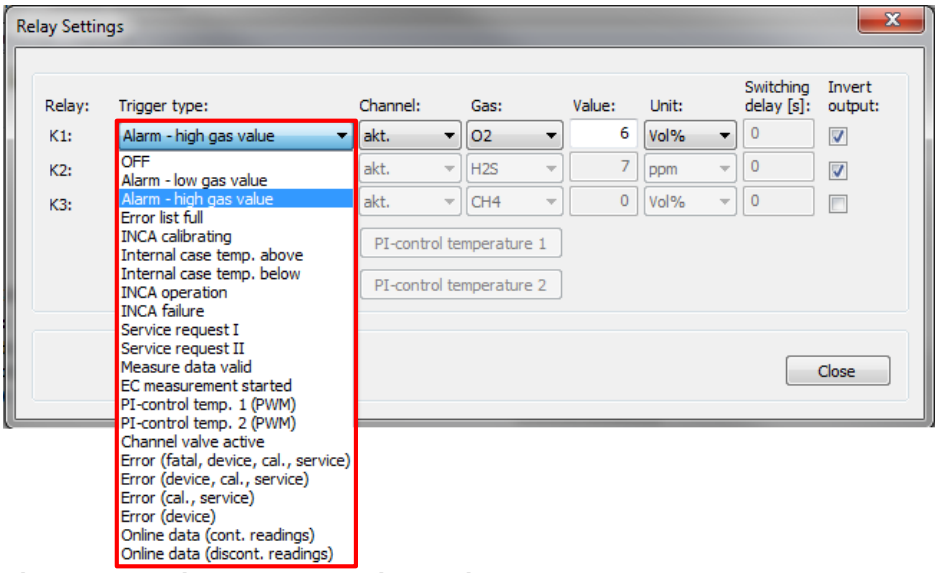


Fig. 5.25: Trigger types settings relay K1 to K3

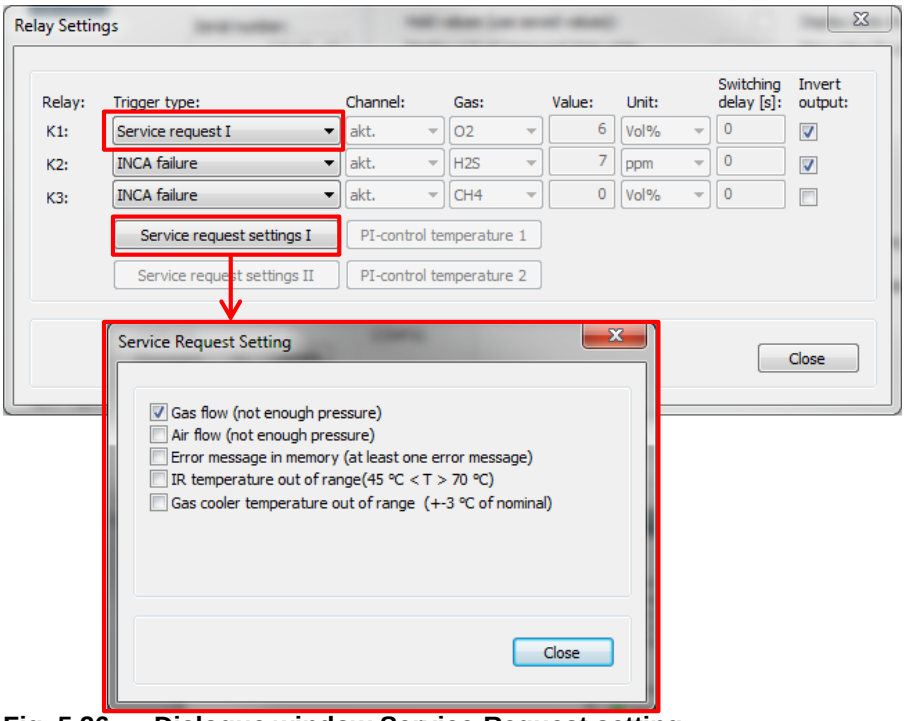


Fig. 5.26: Dialogue window Service-Request setting

- ***K4 – K11***
  The menu ***Add-On Relay Settings*** offers customized configuration of the optional additional relays K4 – K11 (see **Fig. 5.27**).

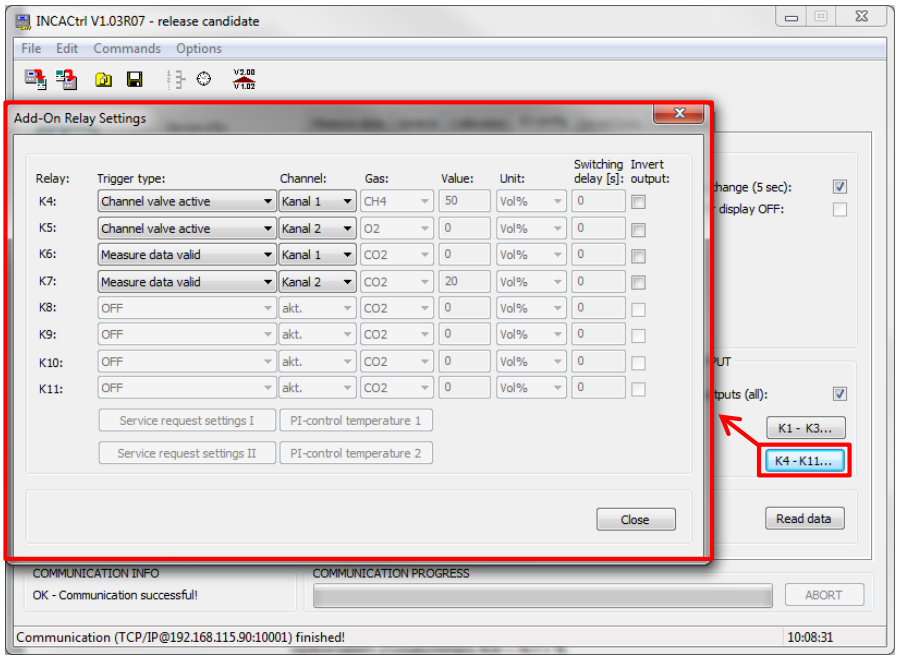


Fig. 5.27: Settings of the optional relays K4 to K11Add-On Relay Settings

3. Analog output

In this scope the analogue output can be configured.

- ***Settings***
  If an analogue output module is installed in the INCA process gas analyser, the configuration of these outputs can be easily done through the dialogue window ***Analog Output Settings*** (see **Fig. 5.28**). Every signal can be activated or deactivated with the channel selection boxes. If ***curr.*** (for current measured channel) is chosen, the data is output according to the above settings no matter which channel is measuring. If a channel does not measure actively, the last measured and saved measurement value is issued.

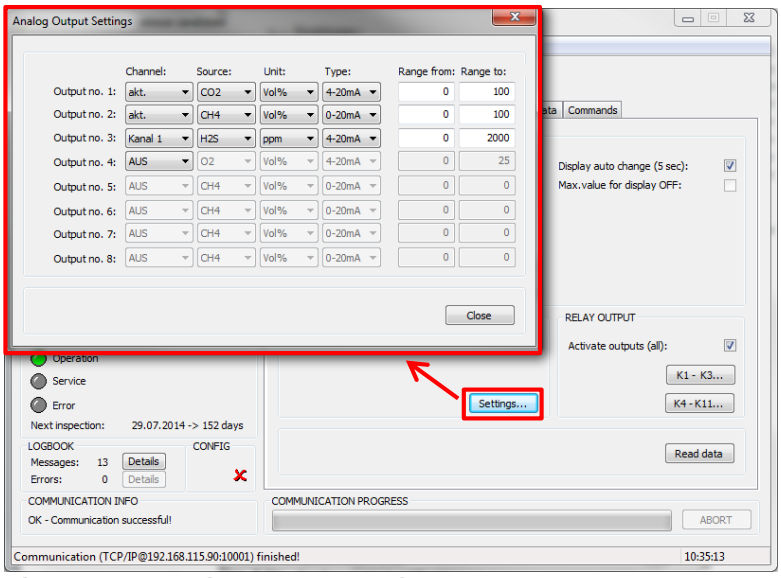


Fig. 5.28: Analog Output Settings

5.6.5 Saved Data

The measurement data saved in the INCA process gas analyser can be displayed in the software INCACtrl (see **Fig. 5.29**).

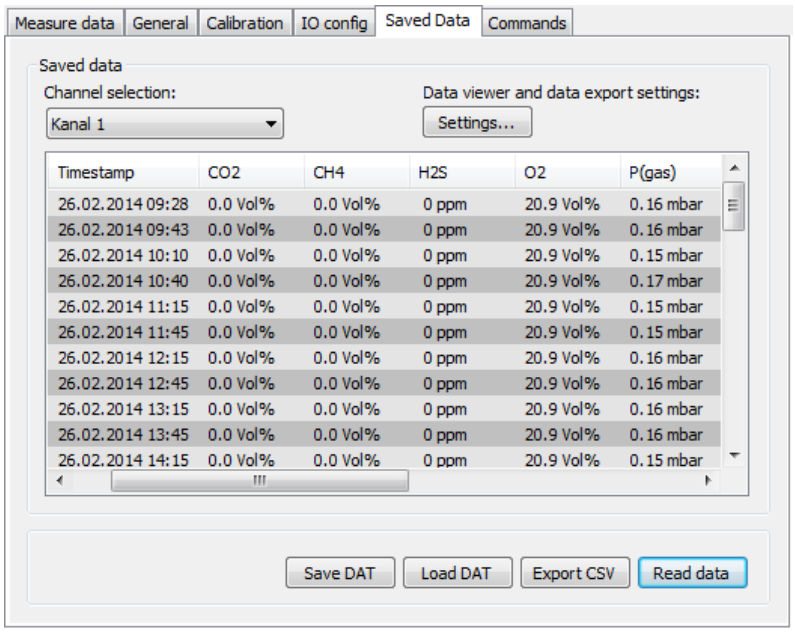


Fig. 5.29: Tab Saved Data

- **Channel Selection**
  Selection of the measurement channel
- **Data Viewer and data export settings**
  The button Settings opens the dialogue window Save Data Settings (see **Fig. 5.30**). Here you can select which measurement values are displayed.
- **Save DAT**
  Saves measurement data from the INCA process gas analyser as a file in the INCA file format on your computer.
- **Load DAT**
  Loads saved data from INCA file for display in INCACtrl software.
- **Export CSV**
  Saves measurement values of the INCA process gas analyser to a CSV file, e.g. to be edited in MS Excel.
- **Read Data**
  After selecting the corresponding channel (***Channel Selection***), you can select the button ***Read Data*** to load the saved measurement values of this channel from the INCA process gas analyser.

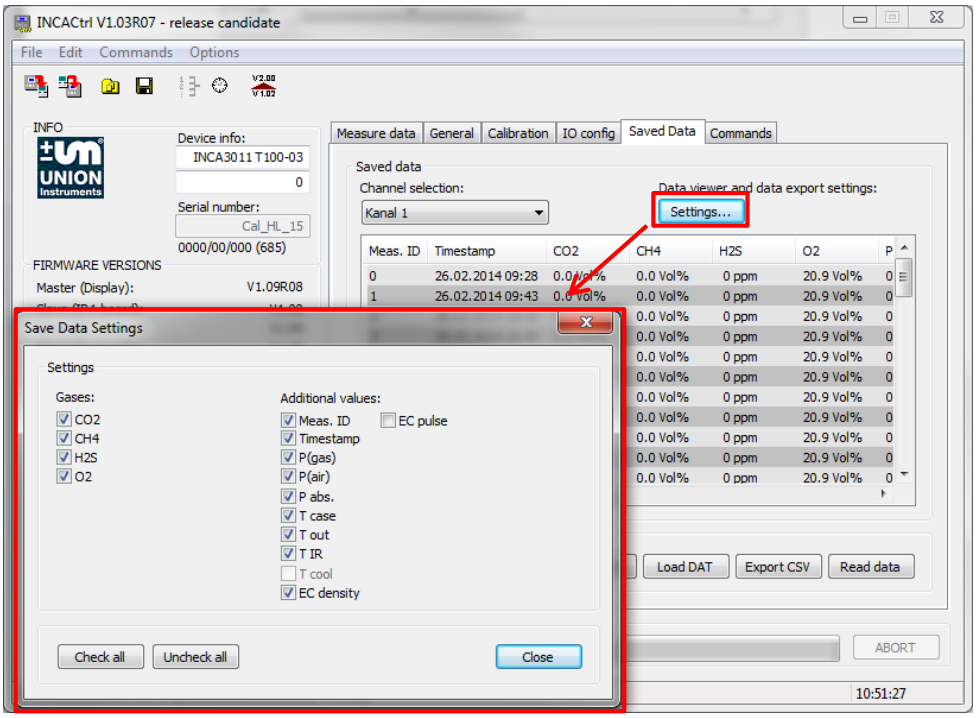


Fig. 5.30: Save Data Settings

If data are marked in orange, they are data of a calibration done in the active ***Expert mode*** (see section **5.6.3 Calibration, Calibration Error Check, page 37**) (see **Fig. 5.31**).

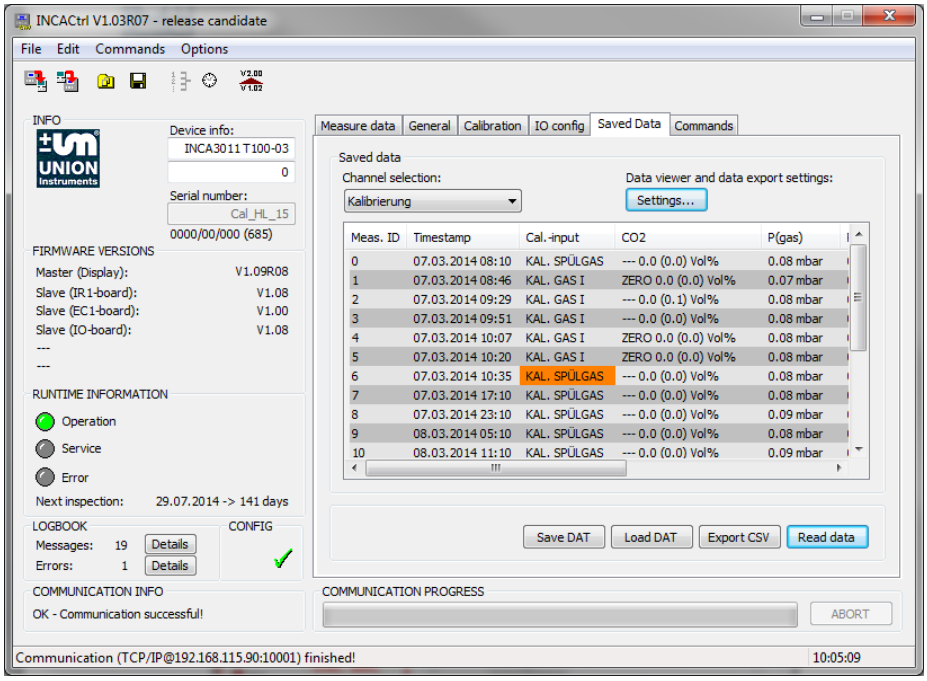


Fig. 5.31: Measurement values of a calibration in Saved Data with activated Expert mode

If the displayed data are marked red, an error has occurred during calibration (see **Fig. 5.32**). Reasons for this could be a manual cancelation by the user or a fault / an error (see document ***Quick guide INCA - Error and service messages***).

⚠ Attention

With *activated Expert mode*, the calibration points are set despite the errors. There is a risk if faulty calibration!

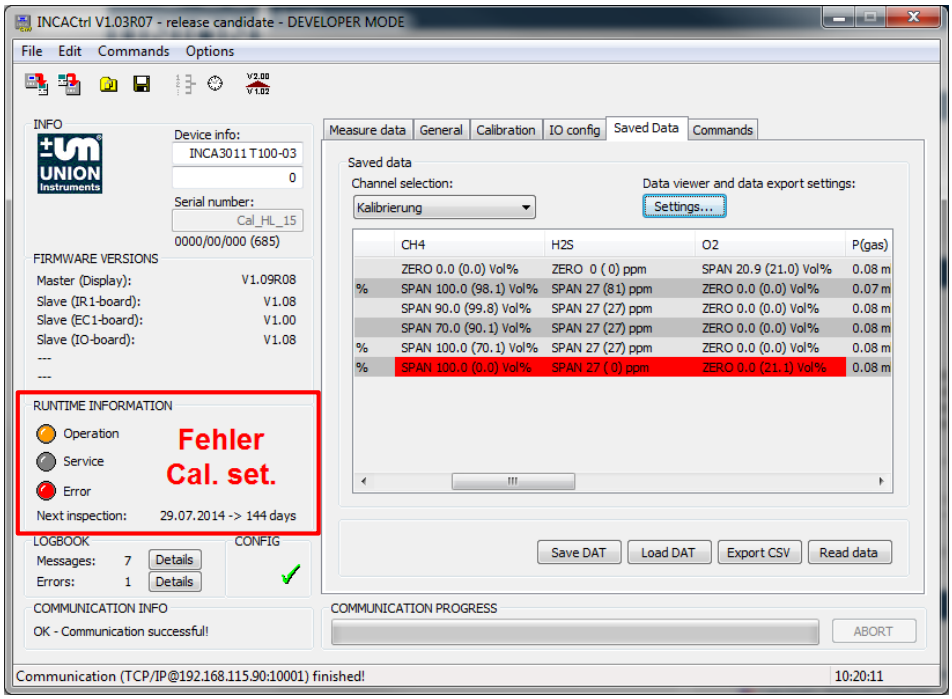


Fig. 5.32: Error calibration, data Saved Data

5.6.6 Commands

In the tab Commands you can control the device, as an alternative to entering commands on the display of the INCA process gas analyser (at the enclosure door).

The tab is divided into four sections (see **Fig. 5.33**).

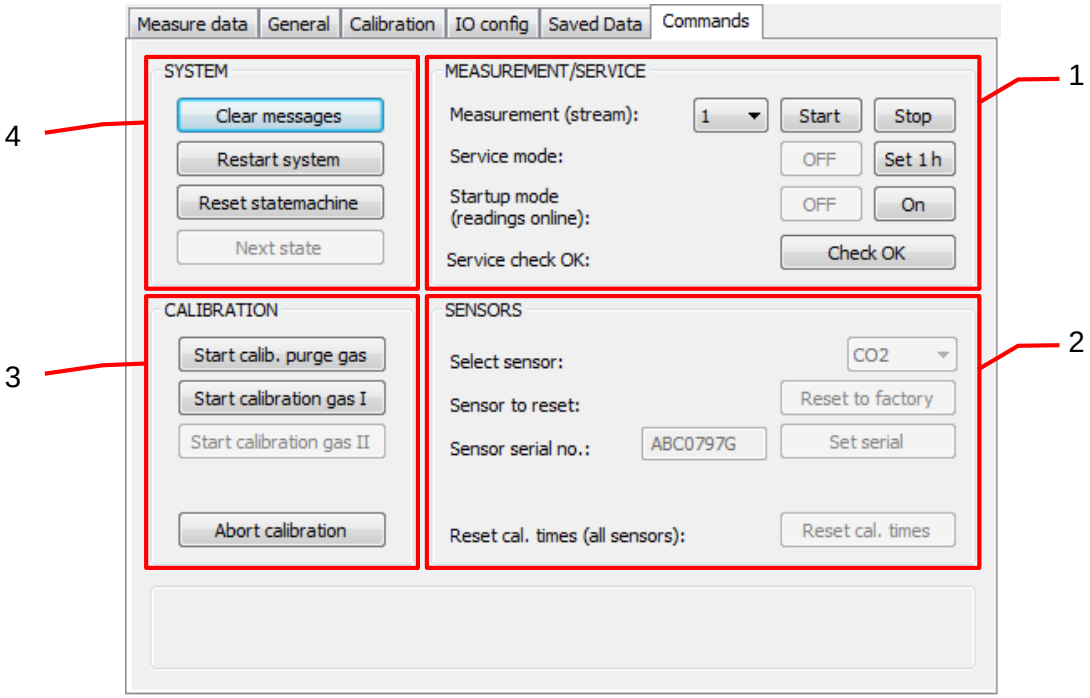


Fig. 5.33: Tab Commands

1. Measurement / Service
2. Sensors
3. System
4. Calibration

1. Measurement / Service

- **Measurement (stream)**
  With this command you can stop a measurement. In addition, you can start a measurement by channel. After selecting a measurement channel and doing the measurement, the INCA process gas analyser returns to the initial measurement cycle.
- **Service mode**
  Switching service mode On/Off. The service mode lasts 1 hour but can be switched off before that period has expired (***OFF***). During *Service mode*, the mA- and relay contacts of the PCB-IO are frozen. If *Service mode* is active, then the output is shown in INCACtrl on the display. In active service mode, the LED at the PCB-IO on the device flashes in orange.

NOTE

Activating *Service mode* is only possible if the slave IO-board has a firmware version of V1.08 or higher.

- **Startup mode (readings online)**
  If activated (***On***), all measurement data for the current measurement (incl. previous cycles) are issued online. In discontinuous measurement mode, the *Startup mode* is deactivated with a channel change. For a device with continuous measurement mode, the *Startup mode* is active until pure gas calibration (Purge gas Calib.) or until restart.

- **Service check OK**
  Confirmation after Service check. The time until the next Service Check is then reset to 6 months.

2. **Sensors**

NOTE

The options in this section

- **Select Sensor**
- **Sensor to reset**
- **Sensor serial no.**
- **Reset cal. Times (all sensors)**

are password-protected and can only be configured by developers of UNION Instruments GmbH.

3. **Calibration**

   Starting and cancelling a calibration with purge gas (purge gas) or calibration gas (***calibration gas 1 / 2***).

4. **System**

   In this section, the user can reset the system or the device (***Restart system, Reset statemachine***) and delete the message display (Messages / Errors).

   - **Restart system** corresponds to a cold start, comparable to pressing the reset button at the PC.
   - **Restart statemachine** represents a warm start, comparable to a restart of a PC using the Windows Start menu.

List of figures