



INA55-701

Configuration software for ING7 and INE7
series gas detectors

Programming manual



GameOver

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GENERAL INFORMATION

About this manual 1-1

DCMPINIEINA55701 **MANUAL CODE**

1.00 **REVISION**

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**INIM ELECTRONICS
S.R.L.**

Configuration software 1-2

This manual is a guide for the configuration of the ING7 and INE7 series gas detectors via the INA55-701 software user interface.

Manual reserved for personnel qualified in gas detection procedures.

The configuration of the gas detectors can be done via PC (through software interface) or via Android smartphone (through the app).

The user interface allows:

- the real-time reading of the gas concentration value
- alarm, fault and pre-alarm simulation
- thresholds configuration in L.I.E. or P.P.M or percentage (%) of the gas volume in air
- select delays from 0 to 240 seconds for each individual threshold
- environment temperature compensation

INA55-701 comes with:

- CD with the Android app installation file (apk) and PC software
- gas detector J2 connector and PC USB port interface cable
- smartphone USB adapter cable

PACKAGE CONTENTS

Gas detectors denomination

1-3

ING7 and INE7 series gas detectors can be distinguished by the following characteristics:

Gas detectors	Metal enclosure		Type of detectable gas		Sensor type		Control panel interface	
IN	G	IP55 rated dust-proof enclosure	700	Methane	S	semiconductor	42	with 4-20mA analog output
	E	ATEX II 2G Ex-d IIC T6 Gb explosion-proof enclosure	701	Special gases	C	catalytic	RL	with Pre-alarms, Alarm and Fault relay outputs
			702	Petrol fumes	H	electrochemical cell	AS-C	with conventional line connection, for INIM control panels
			703	Carbon monoxide			AS-M	with analog addressable line connection, for ENEA series modules
			704	Hydrogen			LE	for ENEA analog loop
			705	GPL				
			706	Propane				
			707	Ammonia 100/200 ppm				
			708	Ammonia 1000/2000 ppm				
			709	Acetylene				

"Special" gases list:

- INx701S-xx detectors– Semiconductor: Methanol (Methyl Alcohol), Heptane, Toluene, Xylene, Acetone, Ethanol (Ethyl alcohol), Butane, Hexane
- INx701C-xx detectors– Catalytic: Methanol (Methyl Alcohol), Pentane, Heptane, Toluene, Xylene, Acetone, Ethanol (Ethyl alcohol), Butane, Hexane

ANDROID APPLICATION

The App contains 3 pages, with various parameters available to the user depending on the access level:

- Parameters
- Sensor Info
- Command

Connections 2-1

Connect the smartphone to the detector using both supplied cables: USB interface cable with the detector J2 connector and the USB adapter with the smartphone.

The Android smartphone must support USB host mode.

Note

In order to avoid damage to both the sensor and smartphone use only the original interface wire.

Access levels 2-2

Level "1" allows basic management of the detector, whereas level "2" allows advanced programming of various parameters.

Password free access. It allows verification of the sensor parameter settings and implementation of tests such as: pre-alarm, alarm and fault simulation.

LEVEL 1

Level "2", protected by a password, allows advanced programming, the calibration of the sensor and the replacing of the head.

LEVEL 2

Level "2" access default password is:

DEFAULT PASSWORD

1234

Parameters 2-3

	Parameters	Level 1 View	Level 2 Modifiable Parameters	Default values
	Value	Real-time of the gas concentration value	No	
	Sensor connected	Indicates that the sensor is connected. If an error occurs, press above to reveal the problem. The example below shows that the sensor head is missing. <div style="text-align: center; margin-top: 10px;"> </div>	No	
	Fault Pre-Alarm Alarm	Visual signalling of fault, pre-alarm and alarm	No	
	Protocol type	Type of protocol	Yes	
	Pre-Alarm, Alarm threshold	This is the value that when exceeded will generate a pre-alarm or alarm event.	Yes	15% Pre-alarm 30% Alarm
	Pre-Alarm, Alarm filter	This determines the time in seconds which must pass before the a pre-alarm or alarm is triggered. If the sensor detects a pre-alarm or alarm situation, for a period of time less than that set on the filter, the sensor will not go into alarm status.	Yes	15s Pre-alarm 15s Alarm
	Ignition delay	Power output delay. This is the time that must pass after sensor power up before the outputs are enabled. Not valid for 4-20mA, systems Bus and Loop, as the reading is immediate	Yes	20s
	Lower limit 4-20mA	This is the measurement value at 4mA. Example: if the value is set at 10, and the unit of measure of the sensor is in L.I.E., it means the 4-20mA system will start operating once 10% of L.I.E. is exceeded. Any reading below 10% L.I.E. will be ignored.	Yes	0
	Upper limit 4-20mA	This is the measurement value at 20mA. Example: if the value is set at 50 and the unit of measurement of the sensor is in L.I.E., it means the 4-20mA system will remain at that level even if the value exceeds 50% of the L.I.E. Any reading above 50% L.I.E. will be ignored.	Yes	100

PARAMETERS		SENSOR INFO	
HEAD SENSOR TYPE	Mtrogeno		
HEAD SENSOR CODE	004		
SENSOR UNIT	% L.I.E		
FIRMWARE VERSION	S-2.3.0-12		
COO-ER	0.0		
COO-OLD	0.0		
OPERATIVE TIME	09:45:15		
YEAR	15		
ID	09002		
BIT	285		
ZERO	285		
ALARM TIME	00:00:00		
MAX VALUE	15.98		
ALARM NUM	0		

Information about the sensor	
Head sensor type	Gas detected (Methane, LPG, Hydrogen, etc.)
Head sensor code	Protocol transmission code for the identification of the type of head and gas.
Sensor measure unit	P.P.M. for CO and Ammonia sensors. Percentage (%) of the volume in air for Oxygen only (excess and/or lack); L.I.E. for all other sensors.
Firmware version	Version. "S" of the sensor, version "B" of the PCB.
Code -Er	Code of the last sensor error.
Code -Old	Code of the last but one sensor error.
Operative time	Functioning time. This is the time, expressed in hours, which determines the effective operating time.
Year	Year of production.
Id	Identifies the serial number of the sensor.
Bit	Reading expressed in Bit terms.
Zero	Zero level expressed in Bit terms.
Alarm time	Determines the time the sensor remained in alarm status.
Max value	Maximum read value. This is the maximum value detected during the operating period.
Alarm num	Alarm numbers. This is the number of times the sensor has entered into alarm status. The number of real alarms, (not simulations generated by the software) which have occurred during the operating period.

Command 2-5

COMMAND	PARAMETERS	Command buttons	Available to Level 1	Available to Level 2
INSERT PASSWORD	>	Insert password	Yes	Yes
		Fault simulation	Yes	Yes
FAULT SIMULATION	>	Pre-Alarm simulation	Yes	Yes
		Alarm simulation	Yes	Yes
PRE-ALARM SIMULATION	>	Reset simulation	Yes	Yes
		Calibration	No	Yes
ALARM SIMULATION	>	Change head	No	Yes
		Reset error	No	Yes
RESET SIMULATION	>	Fault condition reset (where available)	No	Yes
		Change Password	No	Yes
CALIBRATION	>	About	Yes	Yes
		App information	Yes	Yes
CHANGE HEAD	>			
RESET ERROR	>			
CHANGE PASSWORD	>			
ABOUT	>			

Clicking on the desired box simulates the selected condition.

SIMULATION

The simulation lasts approximately 20 seconds, if you wish to cancel the process before preset time ends press the **Reset simulation** button.

Calibration via App

Prepare all the necessary equipment for the calibration procedure:

- **INB55-xxx**, canister of sample gas with a % suitable for each type of sensor
- **INA55-106**, cup to direct the gas into the sensor
- **INA55-104**, 8mm valve
- **INA55-110**, recommended alternative, 8mm val. and adjustable dispensing flowmeter
- **INA55-701**, communication interface between detector and PC or Smartphone

At this point enter the password to access to level "2" and press "Calibration" command button.

If the sensor has an incorrect zero level the opposite screen will appear: The screen indicates that pressing **Yes** corrects the zero level, whereas pressing **Skip** exits the calibration procedure.

It is always advisable to correct the zero calibration as it is fundamental for exact readings.

On pressing **Yes** the image opposite will be shown.

If you wish to continue with the sensor calibration procedure press **Ok**. If you wish only to correct the zero calibration process press **Cancel**.



Only press **Ok** when you have a full canister of sample gas available for the calibration procedure.

If you press **Ok** and you do not have a full canister, the sensor calibration will be compromised and it will be necessary to send the sensor back to the manufacturer specifying the operations carried out.

After pressing **Ok** proceed by entering the value of the LIE or PPM (indicated on the test canister) in the box on the right of the **Enter value** string.

At this point it is necessary to close the INA55-104 8mm valve in order to avoid gas escaping inadvertently, screw the valve into the gas cylinder, hold the cup onto the sensor nozzle and release the gas until you hear a slow, steady flow of gas coming out. If you are using the valve with the adjustable-dispensing flowmeter (recommended), position it between 1.5 and 2.

At this point you will notice that the value written in red on the instrument begins to rise until it stabilizes at a value, at which point press **Start** and the sensor will be calibrated correctly.

In the example below you can see that the value is stabilized at 40,55% LIE, and after confirmation with the **Start** button, the value of the reading is positioned at 20,50 as the previously written value.



Note



In the event that the message contains an error, carefully read the information to see if it is a procedural error or if the sensing element has expired and can no longer be calibrated.

Change Head

2-7

This function allows the replacement of the head.

Cut the power supply to the sensor, replace the head, power-up the sensor.

Connect the sensor to the software. If by mistake the head replacement is not the same as the original one, a message of error will be shown.

If you press the **Change Head** button at this point the sensor will go into permanent error status and it will be necessary to send it back to the manufacturer for repair.

Note

Press the **Change Head** button and operation will be completed.

Chapter 3

PC INTERFACE SOFTWARE

The software contains 2 sections, with various parameters available to the user depending on the access level:

- Data read from the sensor
- Configuration parameters

Connections 3-1

Connect the PC to the J2 connector in the detector by means of the proper cable.

In order to avoid damage to both the sensor and smartphone use only the original interface wire.

Note

Access levels 3-2

Level "1" allows basic management of the detector, whereas level "2" allows advanced programming of various parameters.

Password free access. It allows verification of the sensor parameter settings and implementation of tests such as: pre-alarm, alarm and fault simulation. **LEVEL 1**

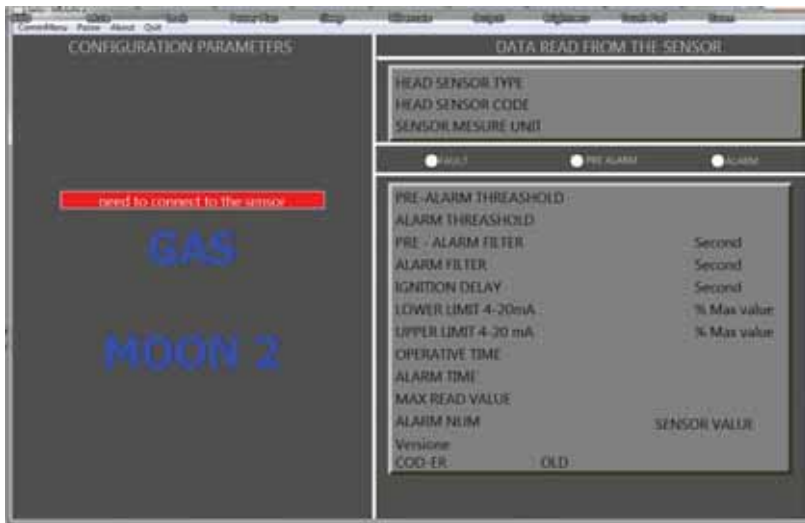
Level "2", protected by a password, allows advanced programming, the calibration of the sensor and the replacing of the head. **LEVEL 2**

Enter the password by means of the **Passw** menu bar option.

Level "2" access default password is: **DEFAULT PASSWORD**

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Once the detector is connected to the PC, launch the program and you will see the screen shown in the picture.



Press the **Need to connect to the sensor** red button to access direct communication with the sensor at level "1". The sensor parameters are shown in the right section.

Parameters	Level 1 View	Level 2 Modifiable Parameters	Default values
Head sensor type	Gas detected (Methane, LPG, Hydrogen, etc.)	No	
Head sensor code	Protocol transmission code for the identification of the type of head and gas.	No	
Sensor measure unit	P.P.M. for CO and Ammonia sensors. Percentage (%) of the volume in air for Oxygen only (excess and/or lack); L.I.E. for all other sensors.	No	
Year	Year of production.	No	
Id	Identifies the serial number of the sensor.	No	
Fault Pre-Alarm Alarm	Visual signalling of fault (yellow), pre-alarm and alarm (red)	No	

Parameters	Level 1 View	Level 2 Modifiable Parameters	Default values
Pre-Alarm, Alarm threshold	This is the value that when exceeded will generate a pre-alarm or alarm event.	Yes	Pre-alarm 15% L.I.E. for explosiveness. 100 P.P.M. for CO; 100 or 1000 P.P.M. for Ammonia; (>) Excess 24%, (<) Lack 18% for Oxygen. Alarm 30% L.I.E. for explosiveness. 200 P.P.M. for CO; 200 or 2000 P.P.M. for Ammonia; (>) Excess 27%, (<) Lack 15% for Oxygen. Correct functioning of the Oxygen sensor is indicated by a value reading of 21%.
Pre-Alarm, Alarm filter	This determines the time in seconds which must pass before a pre-alarm or alarm is triggered. If the sensor detects a pre-alarm or alarm situation, for a period of time less than that set on the filter, the sensor will not go into alarm status.	Yes	15s Pre-alarm 15s Alarm
Ignition delay	Power output delay. This is the time that must pass after sensor power up before the outputs are enabled. Not valid for 4-20mA, systems Bus and Loop, as the reading is immediate	Yes	20s
Lower limit 4-20mA	This is the measurement value at 4mA. Example: if the value is set at 10, and the unit of measure of the sensor is in L.I.E., it means the 4-20mA system will start operating once 10% of L.I.E. is exceeded. Any reading below 10% L.I.E. will be ignored.	Yes	0
Upper limit 4-20mA	This is the measurement value at 20mA. Example: if the value is set at 50 and the unit of measurement of the sensor is in L.I.E., it means the 4-20mA system will remain at that level even if the value exceeds 50% of the L.I.E. Any reading above 50% L.I.E. will be ignored.	Yes	100
Operative time	Functioning time. This is the time, expressed in hours, which determines the effective operating time.	No	
Alarm time	Determines the time the sensor remained in alarm status.	No	
Max read value	Maximum read value. This is the maximum value detected during the operating period.	No	
Version N	Firmware version. Version."S" of the sensor, version"B" of the PCB.	No	
Code -Er	Code of the last sensor error.	No	
Old	Code of the last but one sensor error.	No	

Parameters	Level 1 View	Level 2 Modifiable Parameters	Default values
Sensor value	Real-time of the gas concentration value	No	
Alarm num	Alarm numbers. This is the number of times the sensor has entered into alarm status. The number of real alarms, (not simulations generated by the software) which have occurred during the operating period.	No	

SIMULATION BUTTONS

Command buttons	Available to Level 1	Available to Level 2
Fault simulation	Yes	Yes
Pre-Alarm simulation	Yes	Yes
Alarm simulation	Yes	Yes
Reset simulation	Yes	Yes

The simulation lasts approximately 20 seconds, if you wish to cancel the process before preset time ends press the **Reset simulation** button.

Configuration parameters 3-4

After entering the password to access to level "2", the section on the left will show the configuration parameters with their modifying fields.



First press the arrow <-- button to transfer the data read by the sensor:

- Pre-alarm threshold
- Pre-alarm Filter
- Alarm threshold
- Alarm filter
- Ignition delay

- **Lower limit 4-20 mA**
- **Upper limit 4-20 mA**
- **Send protocol type**, if you are using a sensor with a communication protocol indicate the reference number of the protocol type.

CONFIGURATION BUTTONS

Command buttons		Available to Level 1	Available to Level 2
Send	Writes the programmed data on the sensor with the exception of Send protocol type	No	Yes
Calibration		No	Yes
Change Head		No	Yes
<--	Downloads the sensor data to the PC	No	Yes

Any changes made to the default value setting must be carried out only by authorized personnel in possession of the password

Note

Calibration via software

3-5

Prepare all the necessary equipment for the calibration procedure:

- **INB55-xxx**, canister of sample gas with a % suitable for each type of sensor
- **INA55-106**, cup to direct the gas into the sensor
- **INA55-104**, 8mm valve
- **INA55-110**, recommended alternative, 8mm val. and adjustable dispensing flowmeter
- **INA55-701**, communication interface between detector and PC or Smartphone

At this point enter the password to access to level "2" and press "Calibration" command button.

If the sensor has an incorrect zero level the following screen will appear. The screen indicates that pressing **Zero calibration** corrects the zero level, whereas pressing **Exit** skips the calibration procedure.

It is always advisable to correct the zero calibration as it is fundamental for exact readings.

On pressing **Zero calibration** a window will be opened where you can press **Enter** if you wish to continue with the sensor calibration procedure or press **Exit** you wish only to correct the zero calibration.

If you cancel the procedure, only the zero correction will be done.



Only press **Enter** when you have a full canister of sample gas available for the calibration procedure.

If you press **Enter** and you do not have a full canister, the sensor calibration will be compromised and it will be necessary to send the sensor back to the manufacturer specifying the operations carried out.

Note

After pressing Enter the following screen will appear:

Proceed by entering the value of the LEL (indicated on the test canister) in the white **Value** box, any commas must be typed in as a full stop (dot).

At this point it is necessary to close the INA55-104 8mm valve in order to avoid gas escaping inadvertently, screw the valve into the gas cylinder, hold the cup onto the sensor nozzle and release the gas until you hear a slow, steady flow of gas coming out. If you are using the valve with the adjustable-dispensing flowmeter (recommended), position it between 1.5 and 2.

At this point on the PC you will notice that the red value which measures the concentration begins to rise until it stabilizes at a value, at which point press **Enter** and the sensor will be calibrated correctly.

A message of error appears when the sensor head is faulty or expired.



Change Head 3-6

This function allows the replacement of the head.

Cut the power supply to the sensor, replace the head, power-up the sensor.

Once connected to the software you will see the following message in red, press the **Change Head** button and operation will be completed.



If by mistake the head replacement is not the same as the original one, a message of error will be shown. If you press the **Change Head** button at this point the sensor will go into permanent error status and it will be necessary to send it back to the manufacturer for repair.

Chapter 4

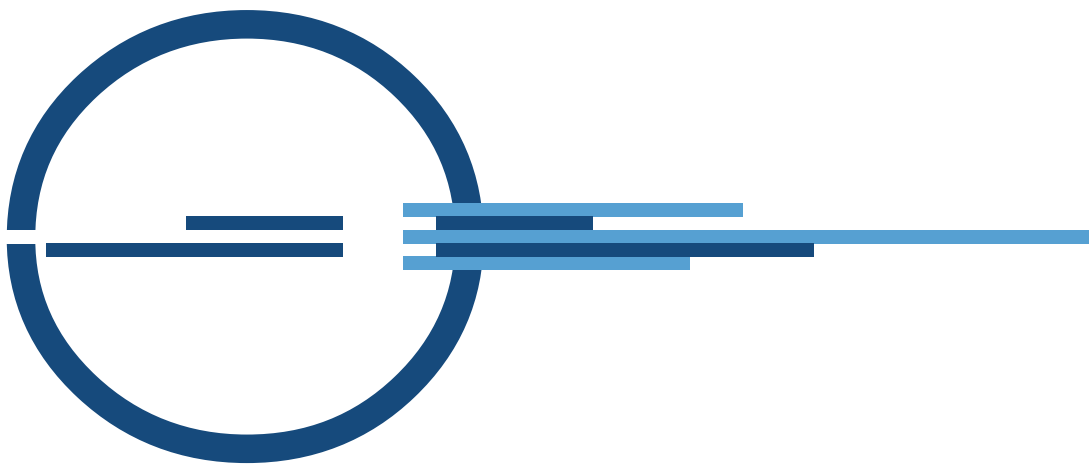
FAULT LIST

The fault data will be shown both on the smartphone application and on the PC software panel in compact notation.

A single description is used to indicate various faults:

No.	String	Description
4	Generic Error	<p>All faults related to the electronics.</p> <ul style="list-style-type: none"> • thermal probe error • end of sensor life error • trimmer error (in semiconductors) • second CPU not present • flash memory error • different sensors <p>Depending on the type of fault, one of the following strings can be shown:</p> <ul style="list-style-type: none"> • "No sensing element" • "Sensor element not compatible" • "Memory error"
5	Sensing element in short circuit	It indicates that the heat resistor or its own sensitive element is shorted.
6	Sensing element open	It indicates that the heat resistor or its own sensitive element is interrupted.
7	Zero level not correct	<p>Indicates that the measurement in clean air or with the probe disabled (cold phase) is incorrect.</p> <p>The fault can be corrected by means of a new calibration.</p>
8	Over or under range	Indicates that the measurement carried out is too low (sure fault) or too high (this might be correct in the case of saturation).

There may be several errors present at the same time.




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ISO 9001 Quality Management
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