USER MANUAL

INCLAB
readout unit

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General Description

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INCLAB is a compact inclinometer data acquisition and storage system. It is controlled by a microprocessor and suitable for measuring all inclinometer probes (both servo-accelerometer and pendulum).

INCLAB control unit, thanks to its flexibility, can be used in various types of measurement both in manual and automatic mode:

- In manual mode, the control unit acquires data when the operator presses the external button supplied with the control unit and therefore the operator has the possibility to scan the acquisition time as needed.

- The automatic mode refers to a type of acquisition scanned by a predetermined time and the reading will be performed at each time scan. This mode allows the operator ease of use, speed of execution and great maneuverability.

In any case, the INCLAB control unit allows the passage between these two modes at any time of the reading.

The INCLAB inclinometer unit allows you to store up to 30 different readings (up to 200 meters with 1 meter pitch for 4 guides or up to 100 meters with ½ meter pitch for 4 guides).

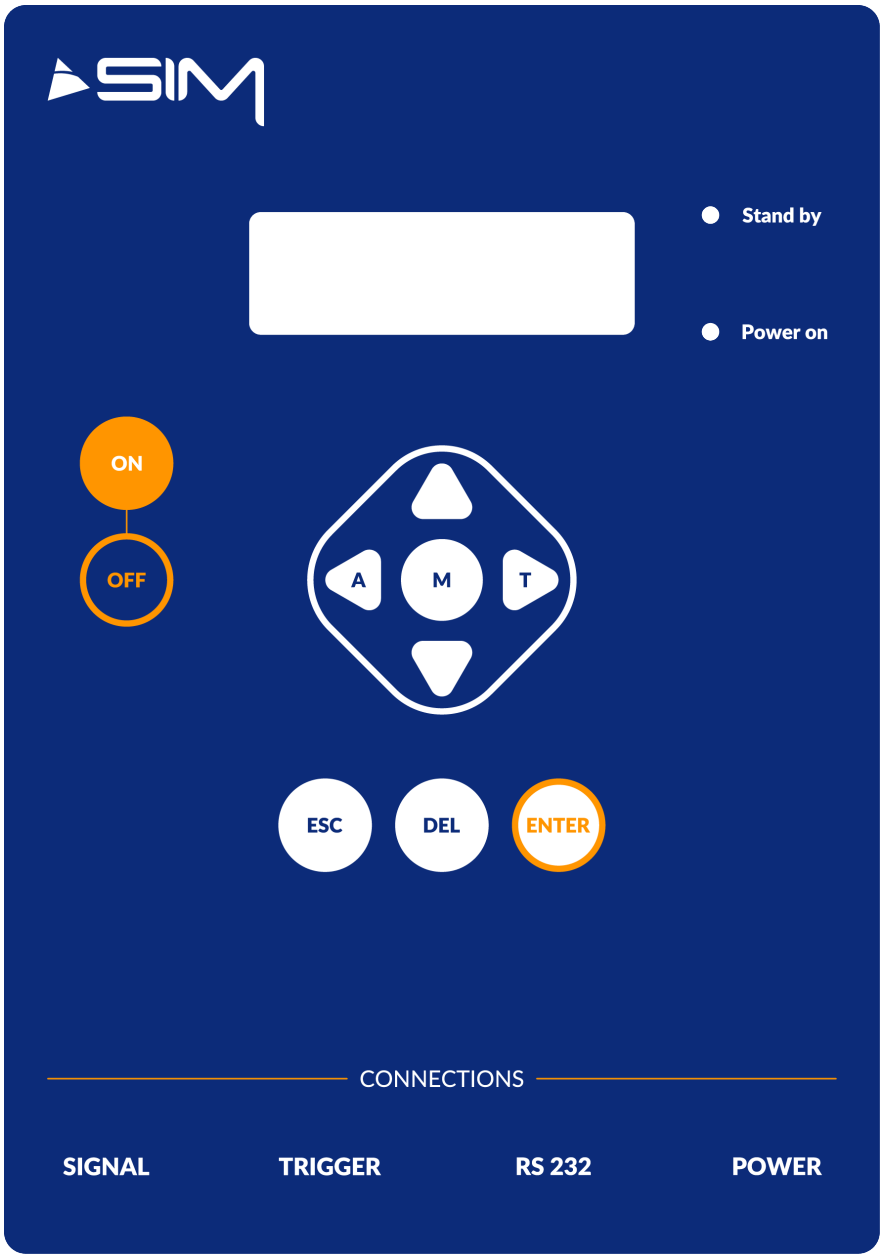
The connection cables are supplied to the control unit:

- power cable to charge the internal batteries
- cable with internal button (trigger)
- serial cable for data download
- connection cable to the roller and the inclinometer probe.

Configuration

2

KEYPAD



Img. 1 - INCLAB interface

KEYS

	Power on INCLAB Power off INCLAB
	Exit the menu
	Switch between AUTOMATIC and MANUAL reading
	Confirm changes
       	Selection and navigation within the menu
	Backlight display (ONLY in the old versions)

POWER ON and INITIALIZATION

Press ON to turn on the control unit, carrying out an operation check, the display will show the message:

```
      INC--LAB

  Autotest: Wait
```

After the self-test, the control unit will display the following message:

```
      INC--LAB

13/09     10:22:54
```

Press the LEFT and RIGHT arrows to navigate through the main menu:

- *UTILITY*
- *PARAMETERS*
- *READINGS*

Press ENTER to access one of the menus listed above.

MAIN MENU

- UTILITY

From the main menu, select UTILITY and press ENTER to access the menu. The following screen will appear:

```
    INC--LAB

  Selection?
```

Press the LEFT and RIGHT arrows to navigate within the menu.

CONTROL UNIT VERSION

Press the RIGHT arrow and it will show INCLAB's version:

```
    INC--LAB

Ver.01     AGO/04
```

BATTERY STATUS

By pressing once again the RIGHT arrow, it will appear:

```
Battery      Volt

  Selection?
```

Press ENTER to show the battery status

```
Battery      Volt

 6.2         00.0
```

Press ESC to exit.

ZERO VALUES

By pressing once again the RIGHT arrow, it will appear:

```
  01    Zero    02

     Selection?
```

Press ENTER to show the zero values

```
  01    Zero    02

+0.0000    +0.0000
```

Press the LEFT and RIGHT arrows to move the cursor to the desired character.

Press the UP and DOWN arrows to change the digits and/or the sign

Once the operation is finished, press ENTER to accept the new zeros. The following screen will appear:

```
    Command

   processed
```

Press ESC to exit.

GAIN VALUES

By pressing once again the RIGHT arrow, it will appear:

```
  01    Gain    02

     Selection?
```

Press ENTER to edit the gains (signal amplifications), the following display will appear:

```
  01    Zero    02

+1.0000    +1.0000
```

Press the LEFT and RIGHT arrows to move the cursor to the desired character.

Press the UP and DOWN arrows to change the digits and/or the sign

Once the operation is finished, press ENTER to accept the new gains.
The following screen will appear:

```
Command
processed
```

Press ESC to exit.

AUTOMATIC READING DELAY

By pressing once again the RIGHT arrow, it will appear:

```
Automatic Delay
Selection?
```

If automatic reading is used, it is possible to choose a delay from 3 to 9 which corresponds in seconds from 5 to 20 seconds.

Press ENTER to edit the delay between one reading and the next (the default is 3), it will appear on the screen:

```
Automatic Delay
3
```

Press the UP and DOWN arrows to change the digits

Once the operation is finished, press ENTER to accept the new gains.
The following screen will appear:

	Command processed
	Press ESC to exit.

SET TIME

	By pressing once again the RIGHT arrow, it will appear: Set Time Selection?
	Press ENTER to set the time, the following display will appear: Set Time 12:23:00
 	Press the LEFT and RIGHT arrows to move the cursor to the desired character.
 	Press the UP and DOWN arrows to change the digits.
	Once the operation is finished, press ENTER to accept the new time. The following screen will appear: Command processed
	Press ESC to exit.

SET DATE

	By pressing once again the RIGHT arrow, it will appear:

	Set Date Selection?
	Press ENTER to set the date, the following display will appear: Set Date 19/08/04
 	Press the LEFT and RIGHT arrows to move the cursor to the desired character.
 	Press the UP and DOWN arrows to change the digits.
	Once the operation is finished, press ENTER to accept the new date. The following screen will appear: Command processed
	Press ESC to exit.

- PARAMETERS

From the main menu, select PARAMETERS and press ENTER to access the menu. The following screen will appear:

```
NB.01  Selection
   Parameters?
```

Press the LEFT and RIGHT arrows to navigate within the menu.

CUSTOMER NAME

By pressing the RIGHT arrow, it will appear:

```
NB.01    Custom.
   Selection?
```

Press ENTER to edit the customer name, the following display will appear:

```
NB.01    Custom.
    CUSTOM01
```

Press the LEFT and RIGHT arrows to move the cursor to the desired character.

Press the UP and DOWN arrows to change the character and select the customer name (maximum 8 characters selectable between capital letters and numbers).

Once the operation is finished, press ENTER to accept the new gains.
The following screen will appear:

```
    Command
   processed
```

Press ESC to exit.

SITE NAME

By pressing once again the RIGHT arrow, it will appear:

```
NB.01    Site
Selection?
```

Press ENTER to edit the site name, the following display will appear:

```
NB.01    Site
SITE0000
```

Press the LEFT and RIGHT arrows to move the cursor to the desired character.

Press the UP and DOWN arrows to change the character and select the site name (maximum 8 characters selectable between capital letters and numbers).

Once the operation is finished, press ENTER to accept the new gains.
The following screen will appear:

```
Command
processed
```

Press ESC to exit.

TUBE NAME

By pressing once again the RIGHT arrow, it will appear:

```
NB.01    Tube N.
Selection?
```

Press ENTER to edit the tube name, the following display will appear:

```
NB.01    Tube N.
T
```

Press the LEFT and RIGHT arrows to move the cursor to the desired character.

Press the UP and DOWN arrows to change the character and select the tube name (maximum 4 characters selectable between capital letters and numbers).

Once the operation is finished, press ENTER to accept the new gains.
The following screen will appear:

```
Command

processed
```

Press ESC to exit.

DEPTH

By pressing once again the RIGHT arrow, it will appear:

```
NB.01    Depth

  Selection?
```

Press ENTER to edit the depth, the following display will appear:

```
NB.01    Depth

     000.0
```

Press the LEFT and RIGHT arrows to move the cursor to the desired character.

Press the UP and DOWN arrows to change the character and select the tube depth (the maximum depth is 200 meters with a step of 1 meter and 100 meters with a step of 0.5 meters).

Once the operation is finished, press ENTER to accept the new gains.
The following screen will appear:

```
Command
processed
```

Press ESC to exit.

STEP

By pressing once again the RIGHT arrow, it will appear:

```
NB.01    Step
Selection?
```

Press ENTER to edit the step, the following display will appear:

```
NB.01    Step
0   0.5mt
```

Press the LEFT and RIGHT arrows to move the cursor to the desired character.

Press the UP and DOWN arrows to change the step between the readings (the step can be 1 or 0.5).

Once the operation is finished, press ENTER to accept the new gains.
The following screen will appear:

```
Command
processed
```

Press ESC to exit.

GUIDES

By pressing once again the RIGHT arrow, it will appear:

```
NB.01    Guides
   Selection?
```

Press ENTER to edit the number of guides, the following display will appear:

```
NB.01    Guides
         2
```

Press the LEFT and RIGHT arrows to move the cursor to the desired character.

Press the UP and DOWN arrows to change the character and select the number of guides (the guides can be 2 or 4).

Once the operation is finished, press ENTER to accept the new gains.
The following screen will appear:

```
     Command
    processed
```

Press ESC to exit.

NORTH

By pressing once again the RIGHT arrow, it will appear:

```
NB.01    North
   Selection?
```

Press ENTER to edit the azimuth value, the following display will appear:

```
NB.01    North
        +000
```

Press the LEFT and RIGHT arrows to move the cursor to the desired character.

Press the UP and DOWN arrows to change the degrees of difference between guide 2 and north (between 0 and 360 degrees plus the sign).

Once the operation is finished, press ENTER to accept the new gains.
The following screen will appear:

```
Command

processed
```

Press ESC to exit.

N. READING

By pressing once again the RIGHT arrow, it will appear:

```
NB.01    Reading

   Selection?
```

Press ENTER to edit the number of the reading, the following display will appear:

```
NB.01    Reading

         00
```

Press the LEFT and RIGHT arrows to move the cursor to the desired character.

Press the UP and DOWN arrows to change the sequential number of the reading (selectable between 0 and 25).

Once the operation is finished, press ENTER to accept the new gains.
The following screen will appear:

```
Command
processed
```

Press ESC to exit.

DATE

By pressing once again the RIGHT arrow, it will appear:

```
NB.01    Date
Selection?
```

Press ENTER to show the date the reading was taken, the following display will appear:

```
NB.01    Date
150904
```

If the reading has not yet been recorded, the following wording will appear:

```
NB.01    Date
GGMMAA
```

Press ESC to exit.

TIME

By pressing once again the RIGHT arrow, it will appear:

```
NB.01    Time
Selection?
```

Press ENTER to edit the time the reading was taken, the following display will appear:

```
NB.01    Time
153314
```

If the reading has not yet been recorded, the following wording will appear:

```
NB.01     Time

      hhmmss
```

Press ESC to exit.

- READINGS

From the main menu, select READINGS and press ENTER to access the menu. The following screen will appear:

```
Selection
Readings?
```

TEST

By pressing the RIGHT arrow it will activate the test mode:

```
TEST
```

Press ENTER to access this mode. The control unit reads both channels continuously (this option is used to check the functionality of the inclinometer probe).

```
TEST
+05600    +00340
```

Press ESC to exit.

AUTOMATIC READOUT

By pressing the RIGHT arrow it will activate the automatic readout mode:

```
AUTOMATIC
READOUT
```

Press ENTER to access this mode, the following display will appear:

```
A01  TT1  P012.0
G1     Selection
```

A — It indicates that we are in automatic readout mode.

01 — It indicates the number of the block where the data will be recorded.
To change the block number use the up and down arrows.

T	It indicates the name of the tube in which the measurements are made.
P	Indicates the depth, this data changes as you go up with the probe.
G1	It indicates the guide to read. To change the guide use the right and left arrows.

Press ENTER when you are sure that the depth, tube name, block and position of the probe at height are all correct.

At this point, the control unit will start the reading cycle and at predetermined intervals (see Automatic Reading Delay in Parameters) it will record the data and signal it with a double beep; at this point the operator can go up.

At the conclusion of the readings in the guide, the control unit will signal a triple beep, marking the next guide to be measured on the display. The following message will appear:

```
CHANGE
G3      Guide
```

When the maximum height is reached in the next guide, press ENTER.

At the conclusion of the readings of all the guides, the control unit will return to the previous menu.

```
AUTOMATIC
READOUT
```

Press ESC twice to go back to the MAIN MENU and update the clock.

MANUAL READOUT

From the main menu, select READINGS and press ENTER to access the menu. The following screen will appear:

```
Selection
Readings?
```

By pressing the central key (M) it will activate the manual readout mode:

```
MANUAL
READOUT
```

Press ENTER to access this mode, the following display will appear:

```
M01   TI1   P035.0

G1      Selection
```

M	It indicates that we are in manual readout mode.
01	It indicates the number of the block where the data will be recorded. To change the block number use the up and down arrows.
T	It indicates the name of the tube in which the measurements are made.
P	Indicates the depth, this data changes as you go up with the probe.
G1	It indicates the guide to read. To change the guide use the right and left arrows.

Press ENTER when you are sure that the depth, tube name, block and position of the probe at height are all correct.

At this point, the control unit will start the reading cycle and pressing the trigger (external button) will record the data and signal it with a double beep, at this point the operator can go up.

At the conclusion of the readings in the guide, the control unit will signal a triple beep, marking the next guide to be measured on the display. The following message will appear:

```
      CHANGE

  G3       Guide
```

When the maximum height is reached in the next guide, press ENTER.

At the conclusion of the readings of all the guides, the control unit will return to the previous menu.

```
      MANUAL

     READOUT
```

Press ESC twice to go back to the MAIN MENU and update the clock.

SWITCHING AUTOMATIC <-> MANUAL

During the execution of a reading it is possible to switch from automatic to manual mode and vice versa, by pressing ENTER hard and fully. The following screen will appear:

```
Readout mode
```

Press the LEFT arrows to switch to MANUAL READOUT mode.

Press the RIGHT arrows to switch to AUTOMATIC READOUT mode.

Connections

3

POWER connector

PIN 1 = + Power supply 12-13,8 Vcc External Battery
PIN 2 = - Power supply
PIN 3 = + Power supply 6-7 Vcc Battery charge
PIN 4 = - Power supply

Consumption with light off 120 mA, with light on 220 mA for 24/12 hour operation.

INCLAB is equipped with a low battery hook circuit, calibrated at 5.5 Vdc. To recharge the instrument's intern battery it takes at least 12 hours.

RS232 connector

PIN 1 = COMMON (to PIN 5 P.C.)
PIN 2 = TX (to PIN 2 P.C.)
PIN 3 = RX (to PIN 3 P.C.)

TRIGGER connector

PIN 1 = MANUAL START BUTTON CONTACT
PIN 4 = MANUAL START BUTTON CONTACT

SIGNAL connector

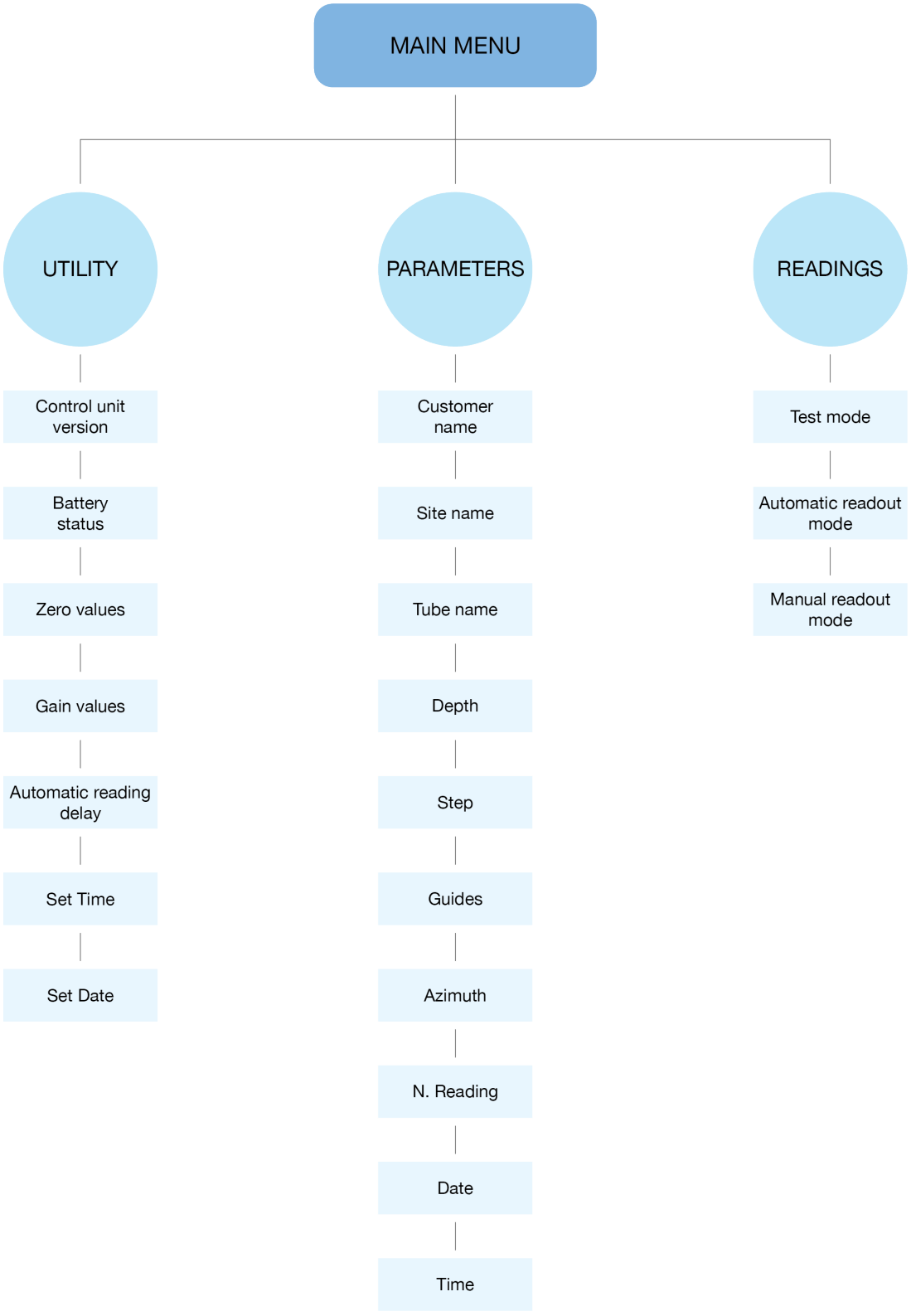
PIN 1 = INPUT + Channel 1
PIN 2 = INPUT - Channel 1*
PIN 3 = INPUT + Channel 2
PIN 4 = INPUT - Channel 2*
PIN 5 = - 15 Vcc sensor power supply
PIN 6 = + 15 Vcc sensor power supply
PIN 7 = central zero sensor power supply**

Notes

*	In SIGNAL connector, pins 2 and 4 are internally connected to electrical zero.
**	The central zero is potential free, if necessary connect pins 2/4 and 7 together, to have the common zero.
***	Channel reading +/- 5 Vdc = +/- 10,000 with the possibility of ZERO and Gain intervention

INCLAB menu
Block diagram

4



NOTES

NOTES

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