

User Manual

Local readout for electrical load cells"LCBOX"

- 4 electric cells version (0L2ADR04LCD)
- 8 electric cells version (0L2ADR08LCD)



FIRMWARE CODE: PDT410 - VERSION: Rev.0.3 SOFTWARE CODE: PWIN43 - VERSION: Rev.0.1

CE COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV ISO 9001/2008

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LOCAL READOUT FEATURES : DESCRIPTION



"LCBOX" local readout allows the sudden reading of maximum 4 (*L2ADR04LCD*) or 8 (*0L2ADR08LCD*) electric load cells.

Reading are shown on the LCD display or saved in a ".csv" file (comma-separated values).

The readout is powered with 4 AA alkaline batteries; at startup on LCD is shown the batteries charge.

We supply also a simple software that, once connected the PC to the readout through RS232/USB cable, allows to:

- Setup every channel of the readout in order to display cells reading directly in kN;
- Save the readings in a text file ".csv" (Microsoft Excel compatible).

Standard accessories

We supply the following standard equipment with the readout:

USB\RS232 cable (1m long)



- 4 AA alkaline batteries (voltage 1,5V)
- CD with the software "PWIN43 rev 0.1", USB drivers and User Manual

TECHNICAL FEATURES

Powering	6 Vcc (4 AA batteries)
Max power consumption	200 mA
Insulation	Class II
Working temperature	-10°C ÷ +50°C (max humidity 85% without condensation)
Storage temperature	-20°C ÷ +60°C
Display	LCD alphanumeric backlight 20 x 4 character (h 9 mm)
Case	IP65 protection grade
On/Off key	IP68 protection grade
Dimension	260 mm x 298 mm x 140 mm
Connections	Through PG9 cable gland
Load cells powering	5 Vcc (max 8 cells min impedance 350 Ω) temporary short circuit safe
Power reserve	1500 min without backlight 750 min with backlight
N. 8 different input cells with the following features:	
Input sensitivy	0.02 μV min.
Linearity	< 0.01% full scale
Temperature drift	< 0.0003% / °C
Internal resolution	24 bit
Measure range	From -1.5 mV/V to +3.5 mV/V
Resolution	0,1 kN
Serial port	COM1: Rs232c full duplex
Max cable length	15m (Rs232c)
Program memory code	60 Kbytes FLASH reprogrammable on board from RS232
Data memory	4 Kbytes
Regulations compliance	EN 61000-6-3, EN 61000-6-2, EN45501

SYMBOLOGY

These are the symbols used in the manual to capture the attention of the reader



Attention! This operation must be carried out by specialized personnel.

Pay special attention to the following indications.



Further informations.

WARNINGS



For a safe and effective functioning it is recommended to read carefully the following instructions before the use.

The load cell local readout had been conceived and designed exclusively to read maximum 8 cells with min. impedance 350 Ohm.

Any other use or unauthorized modification has to be considered under total responsibility of the user.

Besides the regulations listed here, the user must comply in accordance with the current legislation on safety and health of personnel on workplaces.

It has to be checked that the product has no damages caused from the transport.

Verify that the packaging has all the standard accessories as well as any optional accessories requested. If necessary contact the manufacturer.

The product should be used only after the correct connection and following the configuration needed, so the user must execute carefully all the operations described in this manual.

SISGEO is not responsible, for inconveniences, breaks, accidents etc, due to the not knowledge (or anyway to the not application) of the instructions written in this manual.

The use, the eventual maintenance or repair of the product, is allowed only to qualified and authorized operators.

These operators have to be physically and intellectually suitable people.

For information or spare parts orders always specify the data written on the identification and CE printing label put on the products.

In case of replacement of products parts, use exclusively ORIGINAL SPARE PARTS.

The manufacturer reserves the right to make changes, for any constructive or commercial requirement, without any previous notification.

We will try anyway to guarantee that the user manuals are updated in order to reflect the products functional revisions.

WASTE DISPOSAL



According to the European standard 2002/96/CE, the disused instrument must be disposed in a correct way. The recyclable materials are recovered, in order to avoid the environmental damage. For more information, please contact your waste disposal service or the instrument retailer.

LOCAL READOUT IDENTIFICATION LABEL





It's important to communicate these references in case of information or indication requests about local readout, together with software version (PC program) and firmware version (local readout internal program).

Firmware version

Firmware version is shown at the startup.



Software version

COM Select	💶 About PWIN43 🛛 🛛 🔀
С СОМ 1 С СОМ 2 С СОМ 3 С СОМ 4 С СОМ 5	PWIN43 Rev.0.1
ССОМ 6 ССОМ 7 ССОМ 8 ССОМ 9 ССОМ 10	LCBOX Configurator Software for PDT410 board, baud rate auto-detected
About Start Exit	

Starting the software "LCBOX Configurator – PWIN43" and clicking on About is shown software version.

CONNECTIONS

The following procedures must be carried out by specialized personnel.



Every connection must be performed with the local readout turned off.

LOCAL READOUT POWERING



- Local readout is powered through clamps 1&2 with 4 AA alkaline batteries.
- We recommend to use alkaline batteries with high capacity (minimum 2500mAh)
- You turn on the local readout through the ON/OFF key on the bottom of the case.

BOARD POWERING CONNECTIONS

1	6 Vcc
2	GND

NOTE: Connections already executed in factory.

BATTERY LEVELS

V> 5.4 V	FULL CHARGE BATTERY
5.0 <v<5.4 td="" v<=""><td>MEDIUM CHARGE BATTERY</td></v<5.4>	MEDIUM CHARGE BATTERY
V< 5.0 V	BATTERY LOW

NOTE: Battery charge levels are shown in LCD at the startup.

BATTERY LIFE

Battery life is roughly 750 minutes with backlight on and 1500 minutes with backlight off. This battery life refers to batteries with power of at least 2500 mAh.

LOAD CELLS CONNECTIONS



- Cells cables must not be canalized with other cables (e.g. outputs connected to remote control switch or powering cables), but have to follow their own path.
- Any cell cable extension cord must be shielded carefully, respecting color code and using the type of cable supplied from the manufacturer. Extension connection must be executed through welding, through support clamps or junction boxes supplied separately.
- Cell cable must have a number of conductors not higher than the one used. In case of a multi-conductor cable, connect the remaining conductors to the cable powering.

You can connect to local readout maximum 4 or 8 cells.

Cells power voltage is 5 Vcc and is protected from temporary short circuit.

Local readout measure range expects the use of load cells with sensitivity from -1.5 mV/V to +3.5 mV/V.

Load cells cables have to be connected to clamps 8 ...35 from removable terminal block. With 4 conductors cell, you need to make an electrical jumper between power clamps and reference clamps, respecting polarity.

E.g. for cell A connect **9** "- *powering*" with **12** "- *reference* (-sensing)" and **10** "+*powering*" with **11** "+*reference*(+sensing)".



Connect cable shield to cell powering.



Board 1 (4-8 channels version)

Load cells connections A, B, C, D

Board 2 (8 channels version)

Load cells connections E, F, G, H

NUM.	SERIGRAPHY	Terminal box M1 7P step 5.08
1	+ ALIM	6 Vcc Board powering
2	- ALIM	GND Board powering
5	ТХ	RS232 TX
6	RX	RS232 RX
7	-	RS232 GND

NUM CELL A CELL E	NUM CELL B CELL F	NUM CELL C CELL G	NUM CELL D CELL H	Terminal box 7P step 5.08
8	15	28	35	Cable shield
9	16	27	34	- Load cell powering
10	17	26	33	+ Load cell powering
11	18	25	32	+ Load cell reference
12	19	24	31	- Load cell reference
13	20	23	30	- Load cell signal
14	21	22	29	+ Load cell signal

RS232 SERIAL CONNECTION

- For serial connection is used a 9 poles female connector, placed near local readout display.
- For the connection, use a serial 9 poles Rs232 pin to pin cable.
- Serial connection cable must have a max length of 15m (standard EIA RS-232-C).
- The PC used for the connection must be in compliance with standard EN 60950.

9 poles female connector:

2	тх
3	RX
5	GND



We supply a USB\RS232 cable 1m long. Install drivers after reading the manual "USB DRIVER" in the supplied CD.

LOCAL READOUT INSTALLATION



Place the local readout through its brackets. Despite case protection, we recommend to take precaution in order to avoid damages caused from atmospheric agents. Keep the cover panel <u>always</u> closed.



The local readout is managed through the application PWIN43 "LCBOX Configuration Utility"; this PC program has been conceived for the correct functioning on Windows XP.

Local readout is powered through 4 AA 1,5 alkaline batteries; battery charge level is shown for 2 seconds on LCD at startup.

Since you push the ON key, the local readout stays on for 2 minutes; it can be turned off pushing the same key.

To activate backlight push the key while the local readout is working; this stays on for 10 seconds.

"LCBOX Configurator Utility" PWIN43

INSTALLATION

Access PC with administrator privileges, launch "SETUP.EXE" application on CD and follow installation procedure instructions.

APPLICATION START

Select from Program menu the LCBOX Configurator software and start the application. It wil pop up the COM port select windows where the local readout is connected. Communication parameters are detected automatically from the application.

COM Select	COM Select
ССОМ 1 ССОМ 2 ССОМ 3 ССОМ 4 ССОМ 5	© COM 1 © COM 2 © COM 3 © COM 4 © COM 5
ССОМ 6 ССОМ 7 ССОМ 8 ССОМ 9 ССОМ 10	С СОМ 6 С СОМ 7 С СОМ 8 С СОМ 9 С СОМ 10
	Board found: PDT410 Rev.0.1
About Start Exit	About Start Exit



The virtual COM created must be included between 1 and 10; read the manual "USB DRIVER" for further information.

If the selected port is not available (not installed or used from another application) the "Start" key is disabled. It will be shown an error message that alerts the user that the selected COM port is not available.



The local readout must be already on and connected to PC before continuing. If it is switched on at that moment, wait a few seconds before to select the COM port.

MAIN APPLICATION

Program's purpose is to show and change local readout settings connected through serial port; it is also possible to save readings in ".csv" text files.

The following are the application main screens.



Left screen is displayed in kN ("mV/V" key active) whether right screen is displayed in mV/V (key "kN" active).

In the main screen are displayed the information referring to the actual setup of the local readout:

- Software Version: software version installed;
- Channels: number of channel enabled, value between 2 and 8;

In the section mV/V (default display) are shown the readings in mV/V measured for each connected cell. The number on the Channel label identifies the channel. There are two options:

- Numeric value: value measured on the load cell connected to the linked channel;
- **O-L**: the linked channel is enabled but is not connected to a load cell;

Pushing **kN** key on the left part of the screen, is possible to change display mode shifting to readings converted in kN In this way the key label becomes mV/V (and pushing it again you return to mV/V).

DISCONNECT key allows to stop local readout data readings. When pushed, key label becomes **CONNECT** and data display is forbidden. Pushing again the key, data acquisition restarts and the label revert to **DISCONNECT**. In this way is possible to avoid program unwanted blocks due to Timeout and not monitored. This function is useful, for example, if you need to connect and disconnect more instruments sequentially during program execution.



We recommend to disconnect communication pushing DISCONNECT every time you want to connect another LCBOX. Once connected the new one, push CONNECT to restart data acquisition.

Through **ABOUT** key is possible to open, selecting **INFO**, the same information screen that can be displayed pushing the same key in the COM selection screen. If assistance is needed, please refer always the revision software shown in these screen.

LOAD SAVED SETTINGS key allows to upload from file the local readout setting parameters and to program automatically the connected readout. The procedure will be explained in the dedicated paragraph.

For SET CSV FILE and SAVE DATA see section "ACQUISITION SAVINGS ON FILE".

EXIT key returns to the COM selection screen. The same purpose has the menu item File->Exit.

When you disconnect communication through **DISCONNECT** key, every key that allows a communication with local readout are disconnected too (**LOAD SAVED SETTINGS**).



LOCAL READOUT SETUP

With the PC application supplied is possible to setup and program LCBOX parameters (in **bold** factory values):

Number of channels	8/7/6/5/4/3/2	Shows the number of channels displayed on local readout and transferred.
Capacity		For each cell connected is possible to select the maximum load.
LSF mV/V / KN	0.00125	For each cell connected is possible to select Linear Sensitivity Factor (LSF mV/V / KN) value.
mV/V Zero	0.0000	For each cell connected is possible to select signal value equivalent to zero.

Through setup panel you can set local readout parameters and calibration data.

Setup operations can be performed in any order, but we recommend to follow the sequence in the following parameters.



Usually there is no visual confirmation to show that a command has been successfully sent (generally it is linked with the pushing of a button). If there is no message, the command has been correctly accepted from the board. Otherwise (invalid command, incorrect parameter, checksum error etc.) will be displayed an error message.

Procedure description

STEP 1: Channel number setup

Select the number of connected channels to be displayed. Click on "Set Channels" to accept.

Data Sheet Calib.	Save Configuration
	Set
	Data Sheet Calib.

STEP 2: Calibration

Second screen allows to insert the maximum range (Capacity field), linear sensitivity factor (LSF mV/V/kN field) and zero value (mV/V Zero field) of each load cell connected to the readout.



mV/V and mV/V/KN field values must be written with "." (dot) as decimal separator. If it used "," (comma), the program will change automatically this character with the decimal dot.

	Number of	f channels		Data Sheet Calib.	Save Configuration
	Capacity	LSF mV/V/KN	mV∕V Zero		
CH1	1000	0.00125	0.0000		
CH2	1000	0.00125	0.0000		
снз	1000	0.00125	0.0000		
CH4	1000	0.00125	0.0000		Set Calibration

Entering the values specified in the Calibration Report of each cell in this field, is possible to convert the readings from mV/V to kN so that will be displayed on LCD the reading in engineering units (kN).

The values to be inserted are found on the SISGEO Calibration Reports (see next drawing).





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Enabling the display of the cells in kN becomes necessary to connect correctly cells to set channels. Indeed, a channel set for a certain cell will perform incorrect reading if it will be connected to a different one.

While for "LCBOX Configurator – PWIN43" software is possible to change the reading display from mV/V to kN and reverse pushing its key (kN - mV/V), to display also on LCBOX readings in mV/V is necessary, on screen "**Data Sheet Calib**", set the following values:

Capacity: insert mV/V cell capacity LSF mV/V/kN: 1 mV/V Zero: 0

STEP 3: Saving setup in local readout memory

To save setup, you need to click on SAVE to LCBOX. This operation can be performed in any moment.



If the setup is not saved, turning the local readout off causes the loss of every changes previously made.

Number of channels	Data Sheet Calib.	Save Configuration
End of configuration: press " and close configuration proc Press "Save to File" button to sheet calibration information the settings file before or imm	Save" button to save current configu edure o save the current settings configure are not stored in the board memory: nedialty after programming, in order	ration in the board memory ed. REMEMBER: the data : you MUST save them in : to load them from it. ave to File Save to LCBOX

SAVING AND UPLOADING CONFIGURATION

To save the configuration just programmed, use the **Save to File** key in **Save Configuration** screen from calibration panel.

It will pop up the usual Windows screen for saving file and it will possible to choose the name and the saving path of the file.

Data that will be saved are:

- Number of channels
- 8 couples of values capacitymV/V: for the enabled channels there will be the Datasheet Calibration, previously entered in the text box; for the disabled channels there will be empty boxes.

The format is a simple text file that will be read from the configurator.

If the Data Sheet Calibration is not performed, the capacity and mV/V fields will be empty and it will not be possible to re-program this calibration.

	LCBOX		Software Version PDT410 Rev.0.
Channel 1		Channel 2	Channels: 8
0.3370		0.337	0
Channel 3		Channel 4	
0.3370		0.337	0
Channel 5		Channel 6	KN
0-L		0-1	Set CSV File
Channel 7		Channel 8	Save Data
0-L	Disconnect	0-1	Leed Saved Settings
Number of channels	Data Sheet Calib.	Save C	onfiguration
End of configuration: press and close configuration pro Press "Save to File" button sheet calibration informatic the settings file before or in	"Save" button to save current o cedure to save the current settings co n are not stored in the board m nmedialty after programming, ir	configuration in the boa nfigured. REMEMBER: nemory: you MUST sav order to load them fro Save to File	ard memory the data e them in m it. Save to



Saving should be performed just before ending the setup procedure (pushing **Save to File**).

READINGS SAVING ON FILE

It is possible to save the readings clicking on **SAVE DATA**. To enable the recording of the instrument data readings, click on **SET CSV FILE**: once the general screen for file saving is displayed, insert the file name chosen for the record. The file extension will be CSV (Comma Separated Values), that is an universally read format (text editor and spreadsheets like MS Office, suite OpenOffice or similar). Field separator symbol is ";" (semicolon). If you choose a file name already in the folder, it will be shown an inquiry, whether you want to substitute the already saved file with the new one. If you confirm, the reading begins, pushing NO, procedure stops.

Save file				? 🛚
Salva in:	🞯 Desktop		• 🖬 🏠 🖬 •	
Documenti recenti Desktop Documenti	Documenti Risorse del d Risorse di re CDBurnerXP Ethereal Archivio Stu Ethernet Progetto TC Progetto US Riassunto so Simulazione USB	computer ete di e Ricerche DUCHSCREEN B IAR thede WIN13 TS	dgdiscvr.exe dpplicomIO Console CCleaner deasyGUI Etichette FABIO su SaelBook (Saelbr GESTIONE LAVORI su Sael hiwave HyperTerminal PUBLIC Fabio su SaelBook PUBLIC Fabio su SaelBook PUBLIC Fabio su SaelBook Serial to Ethernet Connect Serial to Ethernet Connect	ook) Book (Saelbool Boorso: 115ael
Risorse del computer	<	101		>
	Nome file:	data.csv	<u>•</u>	Salva
Risorse di rete	Salva come:	*.csv	•	Annulla

Every recorded reading file contains the following data in a table:

- Index: progressive number (starting from 1) relevant to the acquisition
- Date: acquisition date (dd/mm/yyyy)
- Time: acquisition time (hh.mm.ss)
- Channel N: acquisition value corresponding to channel N. There are always 8 channels but there will be a value only for the cells actually connected. For example, with the board set for 4 cells reading, you will have Channel 1-2-3-4 fields with read value whether Channel 5-6-7-8 fields will be empty.

After file setup you can save the present reading pushing SAVE DATA.

Acquisition recording happens only when you push the key (each push on SAVE DATA means a record of the value read at the key pushing moment). File is finally saved at program exit, or when you select another file for the acquisitions. The following table is an example of the table created using SAVE DATA.

Index	Date	Time	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Cł
1	18/05/2009	15.01.21	-0,01	-0,01	-0,01	-0,01		
2	18/05/2009	15.01.23	-0,01	-0,01	-0,01	-0,01		
3	18/05/2009	15.01.23	-0,01	-0,01	-0,01	-0,01		



To display correctly CSV file can be necessary to change options on *REGIONAL AND* LANGUAGE OPTIONS.

Please follow the instructions for a correct setup.

Open, with double click *REGIONAL AND LANGUAGE OPTIONS* from *CONTROL PANEL* on Microsoft Windows XP.

egional and L	anguage Options 🛛 👔
Regional Options	Languages Advanced
- Standards and	formats
This option al	ffects how some programs format numbers, currencies,
 Select an iter your own form 	n to match its preferences, or click Eustomize to choose nats:
English (Unit	ed States)
Samples	
Number	400 100 700 00
number.	123,406,783.00
Currency:	\$123,456,789.00
Time:	12:30:59 PM
Short date:	11-Apr-11
Long date:	Monday, April 11, 2011

Click on "Customize....." and set the field as shown in the following picture:

mbers Currency Time Dal	te		
mple			
itive: 123,456,789.00	Negative: -123,456	,789.00	
Decimal symbol:		×	
No. of digits after decimal:	2	v	
Digit grouping symbol:		~	
Digit grouping:	123,456,789	V	
Negative sign symbol:	-	~	
Negative number format:	-1.1	V	
Display leading zeros:	0.7	v	
List separator:		v	SEM

Set "SEMICOLON" in "List separator"

Click "Apply" to confirm.

To load the settings previously saved click **Load Saved Settings**. You will have the generic screen for file opening. Select the chosen setting file and click Open. Saved parameters will be automatically read and sent to the board.

At the end of the procedure, if correct, there will be a screen showing the success of the operation (picture on the right).

In case of errors or timeout, the procedure stops and an error message will be displayed.



COMMUNICATION PARAMETERS

Baud rate: 9600 baud, 8 data bits, 1 stop bits, no parity. The protocol is available on Rs232 serial port and is managed from PC "PWIN43" application.

MAINTENANCE

In case of problems with local readout, it must be opened only from specialized personnel. Before contacting SISGEO please check:

- Batteries voltage;
- In case, with the instrument connected, the local readout measures zero, check that there is electric continuity along the cable between contacts and clamps;
- Instrument using the user manual

BATTERIES CHANGE

If the startup display shows that the batteries voltage is low (BATTERY LOW), they must be changed.

To change the batteries proceed as follows:

- 1. Take 4 AA 1,5V high capacity alkaline batteries;
- 2. Unscrew the four screw of the local readout cover and remove it carefully to avoid damaging the wires and boards.





3. Unscrew the battery cover screws;



- 4. Change the batteries paying attention to polarity;
- 5. Put back the battery cover and the tight the screws;
- 6. Put back the local readout cover, tight the screws. Be careful to line up correctly the cover.

MAINTENANCE SERVICE

After-sales assistance for calibrations, maintenance and repairs, is performed by SISGEO's service department.

The authorization of shipment shall be activated by RMA "Return Manufacturer Authorization". Fill in the RMA module clicking on:

http://www.sisgeo.com/assistance/repairs/return-manufactured-authorisation/

Send back the instrument/equipment with the complete accessories, using suitable packaging, or, even better, the original ones.

The shipping costs shall be covered by the sender.

Please return to the following address with suitable delivery document:

SISGEO S.r.I. Via F.Serpero, 4/F1 20060 MASATE (MI)

On the delivery document is mandatory to indicate the RMA code received.

Technical assistance e-mail: assistance@sisgeo.com



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