LUMEL

PROGRAMMER FOR N15, N15Z, N17Z DIGITAL METER SERIES and P15, P16 TRANSDUCERS

USER'S MANUAL

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April 2007 - KZ 1362/07

1. APPLICATION

The PD15 programmer is destined to program meters of N15 , N15Z, N17Z digital meter series, P15 and P16 transducers in the windows 9x/2000/NT/XP environment.

The programmer enables:

- zmianę parametrów mierników i przetworników,
- kalibrację mierników i przetworników.

2. PROGRAMMER SET

The PD15 programmer set is composed of:

- PD15 programmer	1 pc
- Mini CD Diskette with software	1 pc
- Adapter plate	1 pc
- User's manual	1 pc
- Guarantee card	1 pc

When unpacking the programmer, please check whether the type and execution code on the plate correspond to the order code.

3. REQUIREMENTS

- Windows 9x/2000/NT/XP
- Ca 2 MB of empty place on the disk
- Minimum 4 MB RAM memory
- LPT port with the possibility of working in the SPP, EPP or EPP/ECP mode

4. OPERATIONAL SAFETY

Symbols included in this user's manual mean:

- Particularly important, one must acquaint with it before connecting the programmer. The non-observation of remarks determined by this symbol can cause the programmer or meter damage.

- One must take into consideration when the programmer is working inconsistently with expectations.

Remarks related to the safety:

- The meter reprogramming should be carried out only by an authorised and qualified personnel.
- Before the meter reprogramming one must check the correctness of the programmer connection with the meter.
- During the meter reprogramming one must remember about the high voltage being on the meter power pack elements. Please observe particular caution. Possible consequence if disregarded.

5. SOFTWARE INSTALLATION

For a correct operation of the PD15 programmer, it is necessary to install the work of the **LPT** port in the **SPP**, **EPP** or **EPP/ECP** mode.

Caution!
In case of the LPT port working in the ECP mode or in case of some main plates in EPP/ECP mode, the PD15 programmer will not work correctly.

One can modify the setting of the LPT port working mode in the computer BIOS, in the „**Integrated peripherals**" properties.

In order to install the PD15 program, one must:
1. Introduce the installation mini CD diskette into the disk station, e.g. **d:**
2. Click the **start** key on the windows task bar and choose **Start...**
3. Write the access path, e.g. **d:\setup.exe**

After starting the installation program, define the in-coming path, e.g. **C:\Program Files\LZAE LUMEL S.A.\Programator PD15** and the working group, e.g.: **LZAE LUMEL S.A.**

6. DESCRIPTION OF THE PD15 PROGRAM

The PD15 program realises following functions:
- **programming** - where it is possible to reprogram meter/transducer parameters,
- **calibration (after giving the calibration password)** - which enables the meter/transducer calibration or its recalibration.

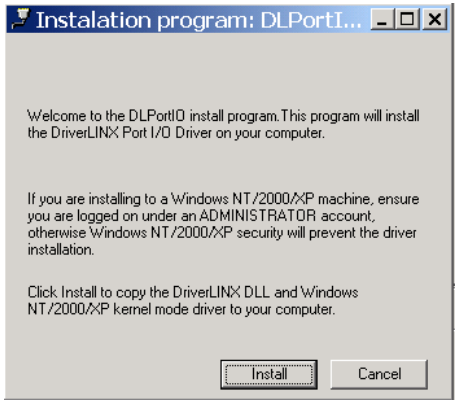


Fig. 1. Installation window of the LPT port driver

The program start follows after clicking the “PD15” program icon in the “LZAE LUMEL SA” group. After starting, the program works in the edition mode. The main program window is shown on the fig. 2.

Caution!

In case of the program start for the first time, one must install the LPT “ DL Port I0” parallel port driver. For this aim, one must choose ”LPT …” -> “LPT Driver...” and next proceed according the description.

The installation program window of the LPT port driver is shown on the Fig. 1.

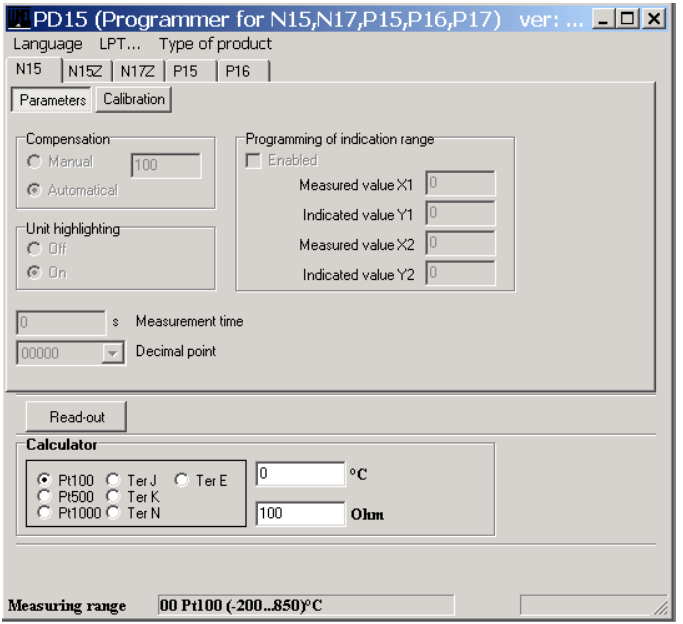
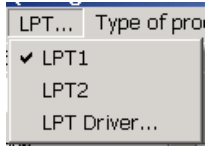
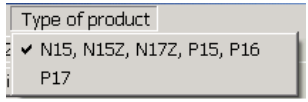


Fig. 2. Program main window

Program menu:





- The **language** enables the work in one of the two language versions: **Polish** or **English**.
- The "**LPT** " program menu enables the selection of the LPT (**LPT1, LPT2**) parallel port and the installation of the LPT port driver (**LPT Driver...**).
- Type device enables the selection of devices of series N15, N15Z, N17Z, P15, P16 or P17. The setting of programmable parameters or P17 calibration can be carried out after the password write.

Readout and recording of parameters into the meter

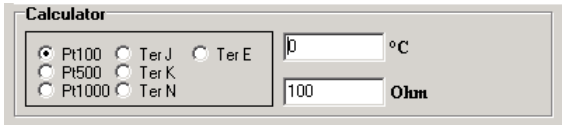
Keys "**Read out**" and "**Write**" serve for readout and recording of meter parameters.

The "**Write**" key activates itself only when follows the readout of parameters from the meter after the first program start. It secures the meter against the discalibration and recording of erroneous meter parameters. The correct readout of parameters from the meter is signalled by the message: " **Programming/readout favourably ended**".

Caution!

The operation failure of meter parameter readout is signalled by the message about error. See p.9 "**Messages about errors**"

Calculator



In order to facilitate the user the recount of the resistance or the thermoelectric voltage into temperature, the program is equipped with a simple recounting calculator for sensor used in N15 meters In case of calculations for thermocouples, the calculator also takes into consideration the sensor temperature of meter terminals.

7. PROGRAMMER CONNECTION TO THE METER

The connection of the programmer with meters and the PC computer is presented on fig. 3 and 4. Before programming, one must remove the meter housing.

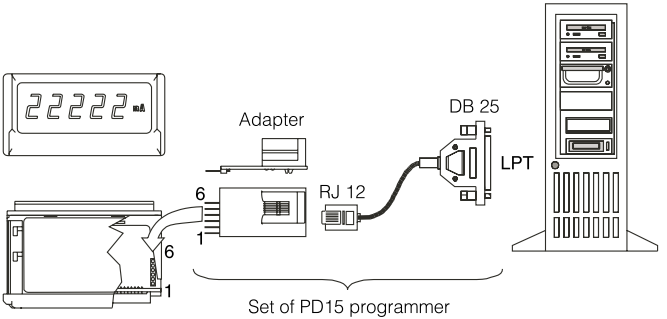


Fig. 3. Programmer connection with N15, N15Z meters and the computer.

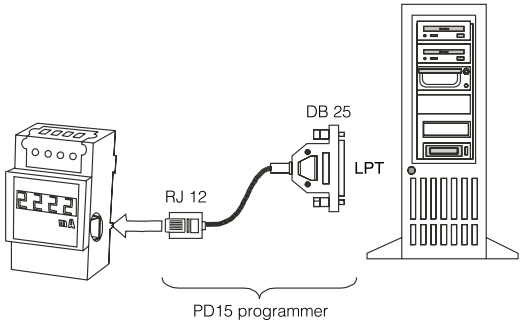


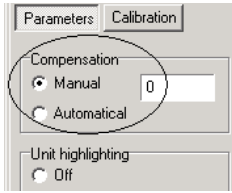
Fig. 4. Programmer connection with N17Z meter and the computer.

W przetworniku P15 gniazdo programatora umieszczone jest wewnątrz obudowy. W celu przeprogramowania należy zdjąć obudowę i na części czołowej przetwornika umieszczone jest gniazdo typu RJ.

W przetworniku P16 gniazdo programatora umieszczone jest wewnątrz obudowy. W celu przeprogramowania należy odkręcić 4 wkręty na pokrywie czołowej i zdjąć obudowę. Na płytce umieszczono 6 pól do podłączenia programatora PD15 z wykorzystaniem dołączonej przejściówki RJ-piny.

7.1. Programming of N15 meter

Parameter programming



Compensation - Compensation kind of the meter working condition changes

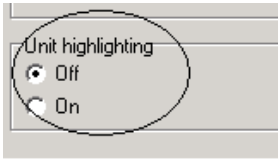
Manual compensation:

Introduce the wire resistance value linking the sensor to the meter (in the case of a meter with RTD sensor) or the value of the ambient temperature (in case of a meter with a thermocouple).

Automatic compensation:

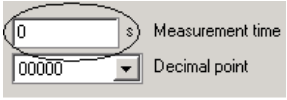
- In case of a resistance thermometer and resistance measurement, concerns the compensation of resistance changes of wires linking the sensor with transducer. It requires a 3-wire line.
- In case of a thermocouple, concerns the compensation of reference junction temperature changes.

The **automatic compensation** does not operate in case of a **4000 Ω potentiometer transmitter** or **RTD Pt500**, **Pt1000**.



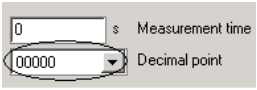
Unit highlighting -

Switching on or off the highlighting of the unit in the meter (**only for meters with a 5-digit display**)



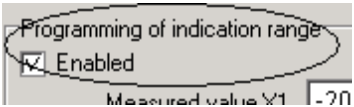
Measurement time -

Measurement averaging time.



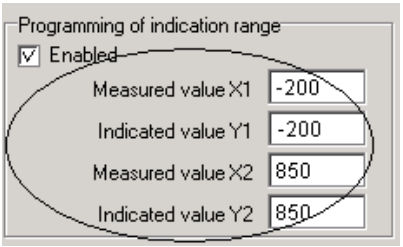
Decimal point -
Setting of the decimal point.

Programming of the indication range



The programming of the indication range gives the possibility of a quick and easy change of the displayed value on the display.

On the base of given co-ordinates of two points by the user, the meter assigns **a** and **b**. (**Y1=a·X1+b**, **Y2=a·X2+b**).



In order to reprogram the indication range one must set the indication range programming on “enabled”. Next, one must set to which values measured on the input (**X1**, **X2**) have to correspond values displayed on the display (**Y1**, **Y2**).

7.2. Label of N15 meter

In case of meter reprogramming, one must fill in the label, writing in their fields the appropriate work parameters of the meter. The label of the N15 meter is shown on the Fig. 5.

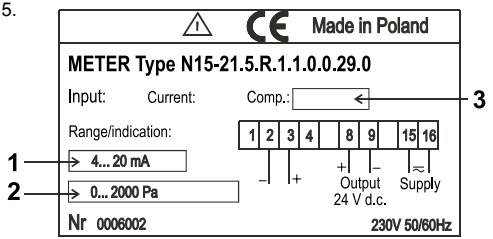


Fig. 5. View of the N15 meter label.

Field Nr 1. One must write the meter working range in, and the unit of the input channel.

Field Nr 2. One must write the meter indication range.

Field Nr 3. One must write the kind of compensation of the sensor work condition changes (only in the case of a temperature meter).

In case of a **manual** compensation:

- for resistance thermometers: in „Ω„, e.g.: **15** Ω (this is the total resistance of two wires connecting the sensor with the meter),
- for thermocouples, value in „**°C**", np.: **25°C** (this is the temperature of terminals),

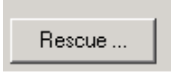
In case of an **automatic** compensation one must write **auto** in. In this case the meter will compensate automatically:

- in case of resistance thermometers - the wire resistance change,
- in case of thermocouples - the terminal temperature change.

7.3. Calibrtion of the N15 meter

The N15 calibration window is accessible after selecting the "**calibration**" tag and writing the calibration password (option accessible only in service workshops).

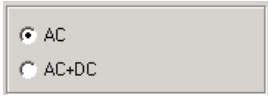
Recovery of calibration coefficients



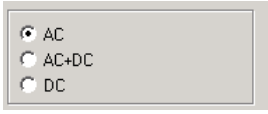
In case of a meter erroneous calibration, there is the possibility to recover calibration coefficients written by the meter Manufacturer during the meter calibration. We can do this by pressing the **Save…** button.

7.4. Programming of N15Z and N17Z meters

Parameter programming



N15Z



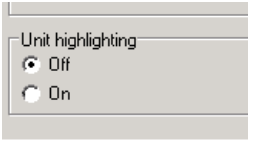
N17Z

Selection of the meter working mode.

AC:
In this mode the meter measure only the variable component

AC+DC:
In this mode the meter measure the variable component together with the constant component. Measurement of **TrueRMS**.

DC:
Accessible only in N17Z. In this mode, the meter measure only the constant component.



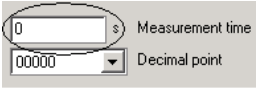
Unit highlighting

Switching on or off the highlighting of the unit in the meter

N15Z – only for meters with a 5-digit display.

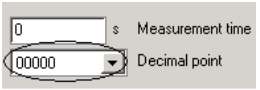
N17Z – all versions

In N15Z meters with a 4-digit display, the change of this parameter does not influence its work.



Measurement time -

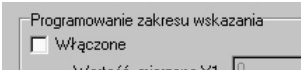
Measurement averaging time.



Decimal point -

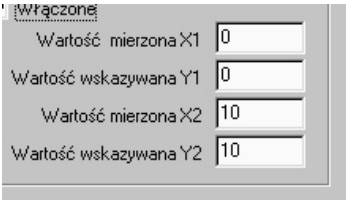
Setting of the decimal point.

Programming of the indication range



The programming of the indication range gives the possibility of a quick and easy change of the displayed value on the display.

On the base of given co-ordinates of two points by the user, the meter assigns **a** and **b**. (**Y1=a·X1+b**, **Y2=a·X2+b**).



In order to reprogram the indication range one must set the indication range programming on “enabled”.

Next, one must set, to which values measured on the input (**X1**, **X2**) have to correspond values displayed on the display (**Y1**, **Y2**).

7.5. Label of N15Z and N17Z meters

In case of meter reprogramming, one must fill in the label, writing in their fields the appropriate work parameters of the meter.

The label of the N15Z and N17Z meters are shown on Fig. 5. and fig. 6.

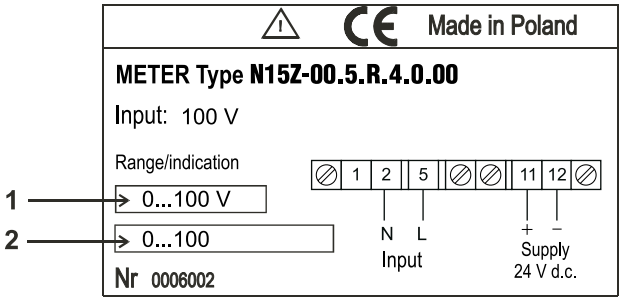


Fig. 6. View of the N15Z meter label

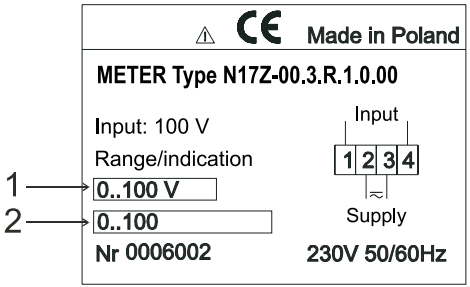


Fig. 7. View of the N17Z meter label

Field Nr 1. One must write the meter working range in, and the unit of the input channel.

Field Nr 2. One must write the meter indication range.

7.6. Calibration of N15Z and N17Z meters

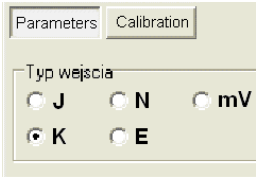
The N15Z and N17Z calibration window is accessible after selecting the "**calibration**" tag.

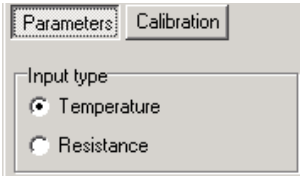
Recovery of calibration coefficients

In case of a meter erroneous calibration, there is the possibility to recover calibration coefficients written by the meter Manufacturer during the meter calibration. We can do this by pressing the **Save…** button.

7.7. Programming of the P15 transducer

Parameter programming



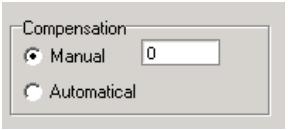


Input type – Kind of input depending on the version of the P15 transducer (measured Signal)

Selection of the type input: J, K, N, E, mV - appears in the case of versions: P15-01X, P15- 02X, P15-03X, P15-04X, P15-09X.

Selection of the type input: Temperature,

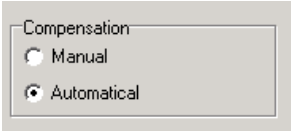
Resistance - appears in the case of versions: P15- 05X, P15-06X, P15-07X, P15-08X.



Compensation – Kind of compensation of transducer work condition changes.

Manual compensation:

Introduce the wire resistance value linking the sensor to the transducer (in the case of a transducer with RTD sensor) or the value of the ambient temperature (in case of a transducer with a thermocouple).

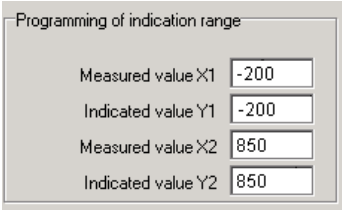


Automatic compensation:

- In case of a resistance thermometer and resistance measurement, concerns the compensation of resistance changes of wires linking the sensor with the transducer. It requires a 3-wire line.
- In case of a thermocouple, concerns the compensation of reference junction temperature changes.

Conversion time – Averaging time, conversion.

Programming of the indication range



The programming of the indication range gives the possibility of a quick and easy change of the displayed value on the display. On the base of given co-ordinates of two points by the user, the transducer assigns **a** and **b** coefficients of the individual characteristic. (**Y1=a·X1+b**, **Y2=a·X2+b**).

In order to reprogram the indication range one must set to which values measured on the input (**X1**, **X2**) have to correspond values displayed on the display (**Y1**, **Y2**).

7.8. Label of P15 transducer

In case of transducer reprogramming, one must fill in the label, writing in their fields the appropriate work parameters of the transducer.

The label of the P15 transducer is shown on the Fig. 8.

Field Nr 1. One must mark the suitable thermocouple or RTD.

Field Nr 2. One must write the kind of compensation of the sensor work condition changes.

In case of a **manual** compensation:

- for resistance thermometers: in „**Ω**", e.g.: **15 Ω** (this is the total resistance of two wires connecting the sensor with the meter),
- for thermocouples, value in „**°C**", e.g.: **25°C** (this is the temperature of terminals),

In case of an **automatic** compensation one must write **auto** in.
In this case the meter will compensate automatically:
- in case of resistance thermometers - the wire resistance change,
- in case of thermocouples - the terminal temperature change of terminals.

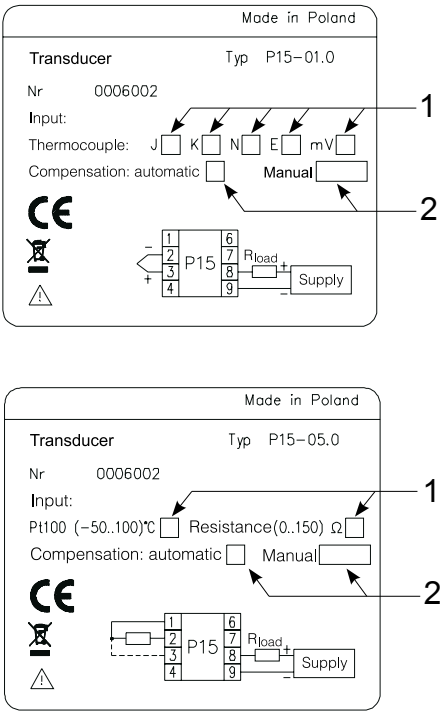


Fig. 8. View of the P15 transducer labels

7.9. Calibration of P15 transducer

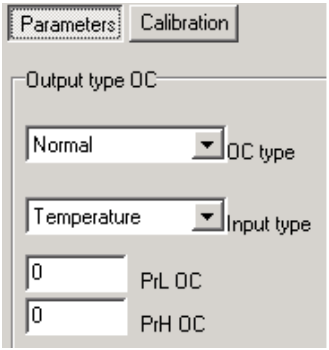
The calibration window of P15 transducer is accessible after selecting the „**Calibration**" tag and writing and acceptation the calibration password (option accessible only in authorized workshops).

Recovery of calibration coefficients

In case of a transducer erroneous calibration, there is the possibility to recover calibration coefficients written by the transducer Manufacturer during the transducer calibration. We can do this by pressing the **Save…** button.

7.10. Programming of the P16 transducer

Parameter programming



Output OC type – Accessible only in the case of a version with OC.

OC type – allows to select: Normal, Enabled, Disabled, Manually enabled, Manually disabled.

Input type - Temperature or humidity

PrL OC – temperature or humidity lower threshold, depending on the selected input type.

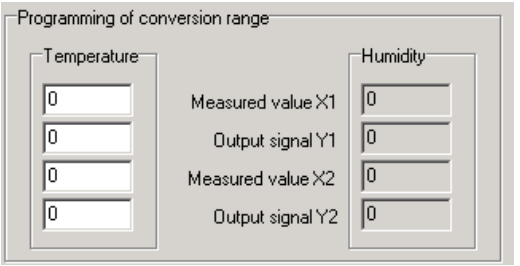
PrH OC – temperature or humidity upper threshold, depending on the selected input type.

Conversion time – Averaging time, conversion.

Programming of the indication range

The programming of the conversion range gives the possibility of a quick and easy change of the displayed value on the display.

On the base of given co-ordinates of two points by the user, the transducer assigns a and b coefficients of the individual characteristic. (**Y1=a·X1+b**, **Y2=a·X2+b**).



In order to reprogram the conversion range, one must set to which values measured on the input (**X1**, **X2**) have to correspond values displayed on the display (**Y1**, **Y2**).

The programming of the Humidity conversion Range is accessible only in the version P16-W

7.11. Label of the P16 transducer

Labels of the P16 transducer are shown on the Fig. 9.

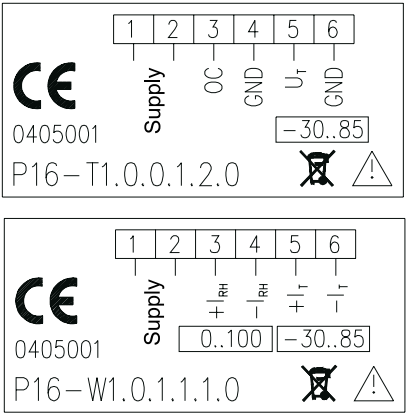


Fig. 9. View of the P16 transducer labels

7.12. Calibration of the P16 transducer

The calibration window of the P16 transducer is accessible after the selection of the "**Calibration**" tag, write and acceptation of the correct calibration password (This option is accessible only in service workshops).

Recovery of calibration coefficients

In case of a transducer erroneous calibration, there is the possibility to recover calibration coefficients written by the transducer Manufacturer during the transducer calibration.

We can do this by pressing the **Save…** button.

8. TECHNICAL DATA

Galvanic isolation	4000 V d.c.
Rated operation conditions:	
- supply voltage	collect from the meter
- ambient temperature	-20…23…60°C
- storage temperature	-20…+85°C
- air relative humidity	<95% (condensation inadmissible)
- working position	any
Communication parameters:	
- data transmission	through LPT link
Assured protection degree	IP 00
Dimensions	DB25 housing
Wire length	1.5 m
Electromagnetic compatibility:	
- immunity	EN 61000-6-2
- emission	EN 61000-6-4

Safety requirements: Acc. EN 61010-1 standard

9. MESSAGES ABOUT ERRORS

In case of incorrect symptoms please acquaint with the following table

Item	Error message	Message reason	Solution
1.	The programmer or the supplying leads are not connected. The sequence programming/ readout did not succeed.	This message appears in the case of meter parameter readout trial when the PD15 programmer is not connected or the meter is not supplied.	One must check whether the programmer is correctly connected to the meter or to the PC computer and whether the meter is connected to the network.
2.	The verification did not succeed.	During the parameter recording into the meter, the programmer found out that the E^2prom memory was erroneous recorded.	Renew the recording operation again and in case of repeated error contact the manufacturer.
3.	The microprocessor was not detected	1. The type of connected meter/transducer is different of the selected in the program. 2. Possible damage of the printed circuit or the processor is blocked.	1. Choose the suitable type of meter/transducer in the program and try to renew the communication. In case of the renewed error contact the manufacturer. 2. Contact the Manufacturer.
4.	Inappropriate format or readout error of the file.	Lack or damage of the “Eeprom.hex” file being in the catalogue in which the PD15 program was installed.	Install a new file of such a name and carry out the readout, and then the recording of parameters into the meter and in case of a repeated blunt of error contact the manufacturer.

5.	Incorrect command including an incorrect LPT port number.	**1.** selected incorrect LPT parallel port. **2.** Inappropriate setting of the LPT parallel port working mode in settings of the computer BIOS	**1.** Change the LPT port number in the program menu. **2.** Enter into computer BIOS settings and into "**Integrated peripherals**" properties. Set the LPT port working mode on **SPP**, **EPP** or **EPP/ECP**. **Caution!** In case of LPT port work in the **ECP** mode the PD15 programmer will not work correctly.
6.	The HEX file is too large for this processor or one of the BLB fuses can not be recorded.	Lack or damage of the "Eeprom.hex: file being in the folder in which the PD15 program was installed.	Install a new file of such a name and carry out the readout and then the recording of parameters into the meter and in case of a repeated blunt of error contact the manufacturer.

10. MAINTENANCE AND GUARANTY

The PD15 programmer does not require any periodical maintenance.
In case of some incorrect unit operations:

1. From the shipping date, during the period given in the annexed guaranty card

One should take the programmer down from the installation and return it to the LUMEL's Quality Control Dept. If the unit has been used in compliance with the instructions, LUMEL S.A. guarantees to repair it free of charge.

2. After the guaranty period:

One should turn over the programmer to repair in a certified service workshop.

The disassembling of the housing causes the cancellation of the granted guaranty. Spare parts are available for the period of five years from the date of purchase.

LUMEL S.A. policy is one of continuous improvement and we reserve the right to make changes in design and specification of any products as engineering advances or necessity requires and revise the above specification without notice.

SALES PROGRAM

MEASUREMENT
CONTROL
RECORDING

- DIGITAL and BARGRAPH PANEL METERS
- MEASURING TRANSDUCERS
- ANALOG PANEL METERS (DIN INSTRUMENTS)
- ANALOG and DIGITAL CLAMP-ON METERS
- pkt pkt INDUSTRIAL and HOUSEHOLD CONTROLLERS
- CHART AND PAPERLESS RECORDERS
- POWER CONTROL UNITS and INVERTERS
- WATT-HOUR METERS
- AUTOMOTIVE DASHBOARD INDICATORS
- ACCESSORIES FOR MEASURING INSTRUMENTS (SHUNTS)
- MEASURING SYSTEMS (ENERGY, HEAT, CONTROL)
- CUSTOM-MADE MEASURING ELECTRONIC DEVICES.

WE ALSO OFFER OUR SERVICES IN THE PRODUCTION OF:

- ALUMINIUM ALLOY PRESSURE CASTINGS
- PRECISION ENGINEERING AND THERMOPLASTICS PARTS
- PRESSURE CASTING DIES AND OTHER TOOLS
- VARIOUS ELECTRONIC SUB-ASSEMBLIES (MSD TECHNOLOGY)

QUALITY PROCEDURES:

According to ISO 9001 and ISO 14001 international requirements.
All our instruments have CE mark.
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