

LENGTH METER

type DELK2191NS



CE

www.aterm.cz

1. Introduction

This product has been designed according to actual state of the engineering, and corresponds to a valid European and national standards and directives. The product is corresponding with the relevant standards. All declarations and documents are deposited at the producer.

The product has a corresponding level of electromagnetic resistance to his ability of undisturbed running in the usual environment.

You should read this documentation, before you start using this product.

The producer doesn't take responsibility for damaging device and accidents caused to individuals, which result from the incompetent manipulation. The producer also isn't responsible for damaging property and casualties caused by incompetent manipulation with this product or by contravening safety regulations. For security reasons and reasons of registration (CE) you hasn't to make any changes in its internal arrangement. The product is intended for using by persons with relevant qualification. Incompetent handling can damage product.

After the end of its working life, the product must be disabled or scrapped according to the laws. Protect your environment and deliver your product to the central collection electro-scrap or return to producer to ensuring its liquidation.



2. General description of the length meter

Length meter DELK2191NS is an electronic device that allows you to measure length of the continually produced or admeasured material. Length meter consists of sensor and digital measuring unit. Both of these parts are separated. To scanning length is specified accurate wheel with circumference 500mm, which is rolling away on surface of material. Measuring wheel is mounted on the shaft, which passes through a pair of bearings mounted in a metal arm. On the other side of arm is drilled hole with 12mm diameter designed for mounting to the manufacturing equipment.

The principle of the measuring system is based on scanning of optoelectronic pulses. One rotation of wheel with circumference 0,5 m get 500 pulses. Output signals of the measuring system are active in both directions for adding and subtracting measured pulses. Front panel contains backlighted LCD display with two lines, each with eight characters, for displaying of the measured length and four control buttons. Meter is equipped with two length preselections and with two output relays. One of the preselection has option for counting the pieces of material.

Other parameters are the correction coefficient for correction measured length, the direction of rotation (forward/backward), the optional range of measurement (cm/mm) and backlighting of display (on/off).

In the standard mode are simultaneously displayed two values of measured length. Each can be individually reset. One of measured length can be used for summary measurement of length and the other can be used for particular measurement of length. When you use the parameter “pieces”, on the top line of the display is measured length and on the bottom line is the number of pieces.

The meter is powered by the network adapter 12V/500mA. On left wall of the meter is located the main switch. On bottom wall are cable entries for the output relay, for the power cable and for the sensor cable. There can be also connector for RS232 interface (version 2191RS). This interface is supplied with software MD6LED, which allows you reading and zeroing measured values over RS232 communication line.

3. Operation of the length meter

When you turn on the power switch, on the top line of display is displayed text "DELK2191NS" and on the bottom line is text "aterm.cz" (Link to the website of manufacturer). After two seconds the meter is reset and zero values are displayed in both lines. One of measured length can be used for summary measurement of length and the other for particular measurement of length.

For setting the parameters are determined button "Menu", button "Save" and buttons with lower and upper arrow. After pressing button "Menu" the password, which is save in memory, appears on the display. You can change the value of the password by arrow buttons. Access to other parameters is possible only with a password "123".

Next parameters you can view by pressing the button "Menu". On the top line is displayed name of the parameter and its value is on the bottom line. These parameters are available:

Pred 1 - first preselection

Cusy – to permitting measurement of the number of pieces

Pred 2 - second preselection

Coefcfc - correction coefficient

Smer – the direction of rotation (forward/backward)

Rozsah – range of measurement (mm/ cm)

Rele(s) – time for dwell period of the relays

Changing value of parameter can be performed by the arrow buttons. Speed of value change is increased by longer pressing one of the buttons. **Saving** newly set of value parameter can be performed by a pressing button "Save". On the top line of the display is text "SAVE" and then the meter is switched to measuring mode. Always is saved only the current parameter.

The correction coefficient allows you to eliminate any measurement errors caused by changes of the diameter of measurement wheel or more often influence expansion measured material. The value of the correction

coefficient is saved in the meter memory. The data correlation for displayed length is:

$$\text{Displayed (actual) length} = \text{Measured length} \times \text{Correction coefficient}$$

If the correction coefficient is 1, then it hasn't effect. The value of the correction coefficient we can specify in this way: first we set coefficient to 1 and we'll do at least 22 m length measurement. We have now two values measured length. The displayed value and the actual value measured accurately (preferably metrologically authenticated) measuring tapes.

$$\text{Then is: } \text{Correction coefficient} = \text{Actual value} / \text{Display value}.$$

When measured and preselected lengths are equal, output relays is turned on. At the same time the measured length value is reset. For zero value of preselection is preselection function turned off.

When parameter "Pieces" is permitted, in the bottom line of display is displayed the number of pieces. A new piece is always added to number of pieces in conformity of the preselection value with the measured length (the first preselection). In conformity of the number of pieces with the second preselection, the second relay is turned on and number of pieces is zeroed.

Direction determines in which direction of wheel rotation are added pulses to measured length.

Range of measurement can be set to value in *mm/cm*. The range in mm is from -999.999 to 999.999 m. The range in cm is from -9999.99 to 9999.99 m.

Relay (s) allows you to adjust the output relays switching time between 0,1 to 25,5 seconds.

4. Software for the length meter

In the case of equipping meter with the RS232 serial line is available test software named DELK2191.EXE that can read and zero measured length through RS232 communication line and save the resulting data. The installation of program is copied to the destination directory. The software is designed for Windows operating system and should work in all 32-bit versions.

Before you run the program, first connect the cable to the computer and then turn on the length meter. After his start program is looking for the connected device. Connection information is then displayed in the status bar (in the bottom of the window). There is the control button *"Read length"* that allows one-time reading of both measured lengths. The buttons *"Zero 1"* and *"Zero 2"* are for zeroing measured lengths. The button *"Periodical reading"* is intended for repeated reading of measured lengths in the selected period, which you can set in the editing field *"Period [s]"*. When the option *"Save data"* is marked, will be measured data stored on disk in a text file. After measuring the automatically created name for the file is displayed in the status bar.

On a disk with DELK2191NS.EXE is also the source file with control routines written in Pascal. Communication runs at 9600 Bd by transmission of ASCII characters. For reading the length, computer first sends the *"#"* character and final *<127>* character. After that, computer receives a reply from the meter: *"> Z1 D6 D1 D2 D3, D4 D5 Z2 S6 S1 S2 S3 S4, S5 R"* and ending character *<127>*, where

Z1 is the sign of length 1 (+ or-)

D6 to D1 are individual characters of measured length 1

Z2 is the sign of length 2 (+ or-)

S1 to S6 are individual characters of measured length 2

R is chosen range (1-mm, 2-cm)

V is the verification byte (for error-free transfer his value is 120)

The length 1 zeroing we make by sending of the character *"%"* and zeroing the length 2 by sending of the character *"&"*.

5. Technical description of the length meter

Length meter is controlled by microprocessor that continuously monitors the status of the transducer pulses and provides adding and subtracting measured length in dependence on the optoelectronic sensor. The measuring software is equipped by special computational procedure, which eliminates the effect of vibration and practically provides the absolute accuracy while pulses are added or subtracted.

6. The safety precautions and the electromagnetic compatibility (EMC)

The device has protection class number III, where protection against electric shock is ensured by safe low voltage. Network adapter meets the conditions of the CSN EN61585-2-6 on safety protective transformers for general use.

If problems with electrostatic or electromagnetic disturbance occurs, you can connect the ground terminal (on the right side of the box) to clamp protective conductor PE from power network 230V/50Hz.

7. Technical specification

Power supply:	12V / 500mA
Power energy:	6VA
Box dimension:	120 x 170 x 90 mm (š x v x h)
Device protection:	IP50

Protection from dangerous touch voltage:	double insulation
Electromagnetic environment:	level 2-protected environment
Working environment:	normal CSN 33 2000-3
Class protection number:	III
Operational temperature:	5 to 40 °C
Length resolution:	0,01 m/0,001 m
Measuring range for mm:	-999,999 to 9999, 999m
Measuring range for cm:	-9999, 99 to 99999 99m
Preselection range for mm:	0 to 999, 999m
Preselection range for cm:	0 to 9999, 99m
Maximum measuring speed:	120 m/min

Service and production:
<http://www.aterm.cz>