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CLI-02
PULSE METER

5 908312 592242

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F&F products are covered by an 24 months warranty from date of purchase

PURPOSE

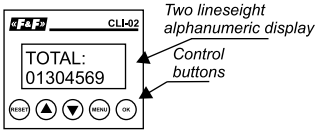
Pulse meter is intended for counting AC/DC voltage signals, generated by additional peripheral devices in order to determine the number of carried out working cycles in automatics systems, e.g. in order to control the number of press strokes, the number of revolutions of a rotating device, the number of components leaving the production line, etc.

METER FUNCTIONS

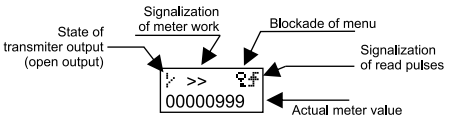
- control panel, enabling programming and the monitoring of device operation
- T input, adapted for operation with AC/DC signal, 5 to 264V amplitude and 50 Hz frequency for AC and 5kHz for DC signals
- possibility to set THRESHOLD parameter (1÷99 999 999 range), specifying the limiting number of pulses counted in a single operation cycle
- external RESET input
- relay output signaling the preset meter state (contact1C/O 8A)
- local counter, reset using the external reset input or using RESET button
- total counter for all impulses (loop mode 0 → 99 999 999 → 0 → ... or reset using the meter configuration menu)
- digital filter, enabling the limiting of maximum frequency of the counted pulses (in order to reduce interferences on meter input)
- local and total meter state memory after supply failure
- program menu in three languages: Polish, English or Russian

Description of display and control panel

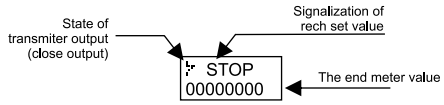
The services and programming meter CLI-02 is used mounted on the casing front panel control. It consists of a two lines, eight alphanumeric display, and placed under it keyboard with five buttons.



Display present information about the current state of work, and in programming mode allows the configuration of the meter parameters, transmiter output. Additional meter setting are protect by PIN code, on the hight right side is key mark.



After reaching the set value STOP message is displayed and the display illumination flashes three times.



After pass to the programming mode of the meter, by display and clear menu configuration, can easily set all parameters of the meter.

Button functions:

MENU ***MENU*** *- pass to programming mode. In the cause that the meter is working in the editing parameter mode, of a number, press this button to go to the next edition of the digits.*

UP DOWN *UP and DOWN - to select the next position of menu, and to increase or decrease value of editing parameter.*

OK ***OK*** *- pass to choosen position of menu and to enter changes*

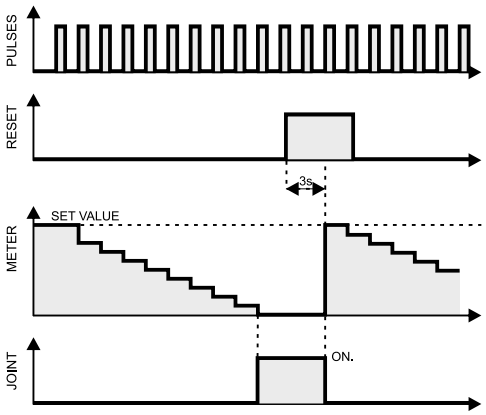
RESET ***RESET*** *- resetting to the current meter cycle. In programming mode allows return to main menu If the RESET button is pressed while editing a parameter, it go out from edit mode without saving changes.*

FUNCTIONING

Meter CLI-02 meter is universal, and that its action depends on the settings made by the user. Here are briefly the basic modes of

Count to down mode and wait for reset

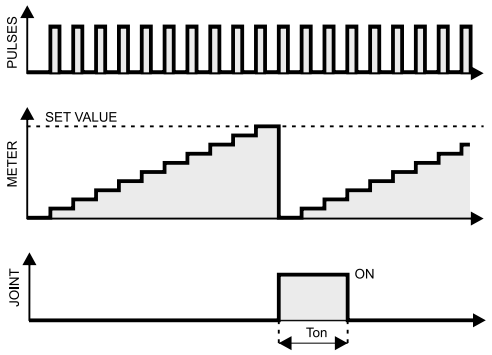
In this mode, user sets the initial meter value. Each incoming pulse causes a decrease in meter. Achieving the zero value to stop counting pulses and generate a desired transmiter output per share. At the same STOP message is displayed and the display illumination flashes three times. Start the next cycle is possible only after the issue of zero signal.

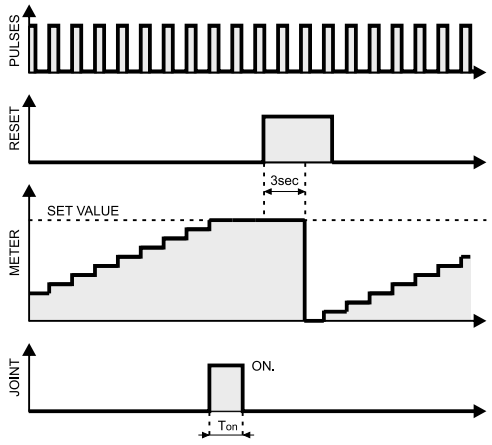


Transmitter output after the end of the count cycle depends on the device configuration and can take one of the following form:
- permanent closure or opening of joint (up to the next joint).
- close relay joint at the time set by the user.
The start of a new cycle is possible only teseted meter from the control panel by pressing the RESET button, or via an external reset input. To protect the system against accidental erasure state of the counter, a zero signal is activated only after three seconds after pressing the RESET button or give signal to reset input.

Cycle - Count to UP mode to reach set value with automatic reset function

This mode is designed for counting pulses from zero up to the value set by the user. After reaching its on input relay pulse is generated for a given time (when the relay joint is set to pulse), or a constant time 0.1 s for the other joint settings. At the same time, the current meter is automatically reset and start the next cycle.





Achieving the set value is indicated by generating action on realy output. At the same time stops counting pulses, the display illumination flashes three times, and the display shows the message STOP

The start of a new cycle is possible only after reset meter from the control panel by pressing the RESET button, or via an external reset input. To protect the system against accidental erasure state of the counter, a signal is activated only after three seconds after pressing the RESET button or give a signal to reset input.

ATTENTION!

If the time of tone is longer than the period of counting pulses to achieve the next desired value will reset the meter, but will not affect the output of transmitter. Next attach the relay will be possible only after the elapse of tone time t and again reaches the set value by the meter.

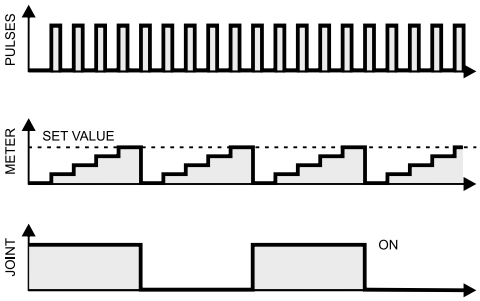
When meter working on a cycle moder display shows only the current value of the meter. Achieving the set value isn't indicated in any additional way

Maximum - Count to UP mode to reach set value and wait to reset

This mode is designed for pulse counting up from zero to a set value. An example of this mode of action, with the relay input with set to pulse for duration time Ton is inpresent the following picture.

Change - Count ot UP mode of meter to set value, change state of relay and automatic reset function.

In this mode, the meter counts pulses from zero to a set value. Achieving the desired results in the relay switch to the opposite condition, reset the meter and automatic launch of a new cycle. This doesn't however, view any additional messages.



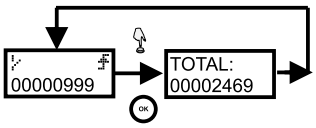
The initial state of the relay depends on the parameter settings in the configuration joint in configuration menu of meter.

Loop - Count to UP mode without set value.

The meter counts pulses until the meter overflow. At the time of overflow at the relay output is generated shares (depending on the parameters in joint menu), the meter is reset and automatically starts the next cycle.

Total meter TOTAL

Behind of local meter, which is reset after actvate RESET button, the system is equipped with a total count, and all pulses and reset only in cause of overflow, or reset from the menu system. To read the total value of the counter, press OK.



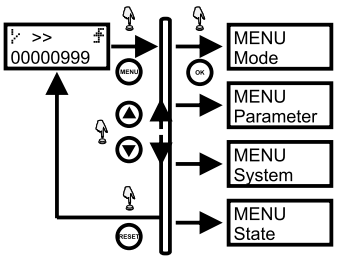
ATTENTION!

Meter stores its current state after turning off the voltage. This means that once again fed the system restore is on the meter, and meter and the total current, and transmitter output

PROGRAMMING

ATTENTION!
PASS TO MENU MODE CAUSE STOP COUNT OF PULSES.

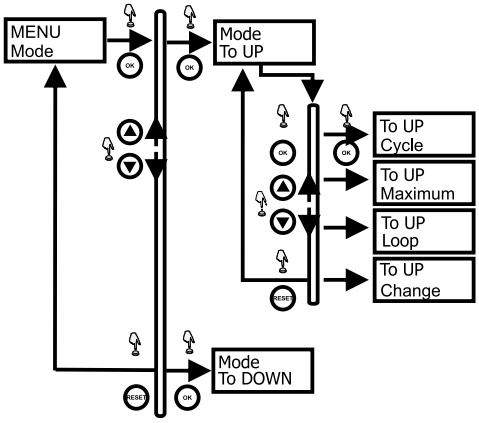
Meter configuration is make by a control panel with a keyboard and display. Pass to the programming mode of the meter is done by pressing the MENU button.



To select menu use the up and down buttons. To pass the selected menu item, press OK. Exit to main menu provides a Reset button. Main menu meter consists of four items, each of which contains its own submenu with a set of specific configuration options.

MENU -> Mode

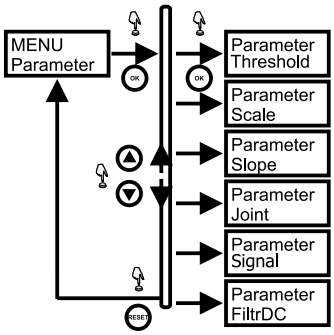
Menu mode allows the meter to determine the direction of work, that meter will count pulses from zero up to the value set, or deducted from a set down to zero value.



1. By MENU button pass to main menu of meter.
2. By buttond UP and DOWN select Menu -> Mode and press OK.
3. Will display Menu -> Mode which include two positions Mode -> To UP and Mode - > To DOWN. To Up means that meter count pulses to Up and to Down meter count from set value to zero. By buttons UP and DOWN select option and press OK..
4. If will selected an option to Down, it is displayed with a enterto save the new setting, then the program returns to display the Menu -> Mode.
5. Selected option To UP cause display submenu with four work option of meter.
a. Count cycle to set value, generate pulse on output, reset meter and next start a cycle.
b. Maximum counting to set value, generated on output a set action and wait for reset.
c. Loo count to reach overflaw of meter and generated on output a set action and wait for reset.
d. Change of count to set value, change state of output to oposite , automatic reset and start next cycle.
Detailed discussion of operating modes, see the Operation part.
6. By buttons UP and DOWN select option and enter by OK. Save changes is indicated by message, after show it program return to Menu -> Mode.
7. Possible is out from edition mode by pressing button RESET. It cause return to main menu without save enrole changes.

MENU -> Parameter

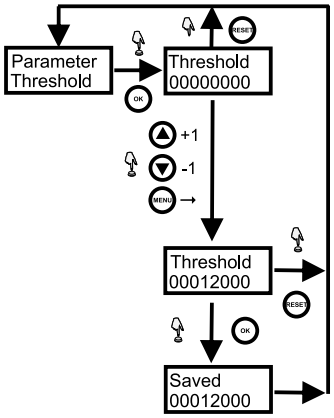
Menu for setting the threshold value, the scaling counter, configure the operating mode and set the relay frequency digital filter. Chart menu is presented in the following picture, while the rest of the instructions are discussed in detail the successive positions.



Parameter -> Threshold

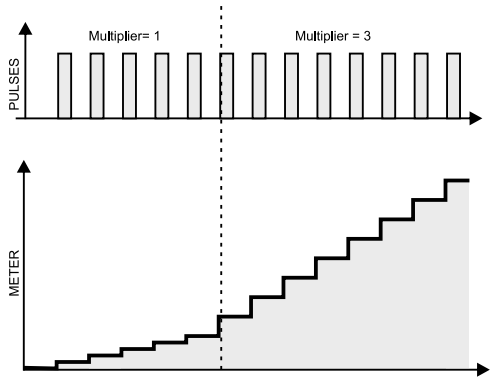
This parameter define number which will be count at everyone work cycle.
To set it is possible by following
1. By button MENU pass to main menu of meter.
2. By buttons UP and DOWN select Menu -> Threshold and press OK.
3. By buttons UP and DOWN select Parameter -> Threshold and press OK.
4. At down line will display actual set value. Number which is actual editing is indicated by blinkin cursor.
5. By buttons UP and DOWN set correct value of digit on editing position. To move edit digit on the next position press button MENU
6. By this way set all digits from set value and enter by OK.

7. Save changes is indicated by message SAVED, after that program return to menu Parameter -> Threshold.
8. Possible is out from menu without save enrol changes by pressing button RESET.



Menu -> Scale

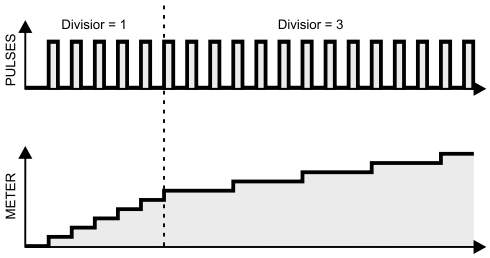
Menu scale is used to scale a count pulses by the system. It consists of two multiplier and divisor. The multiplier determines if the meter value is increased after each counted pulse. For example, multiplier = 3 means that every incoming pulse will cause an increase in the three meter



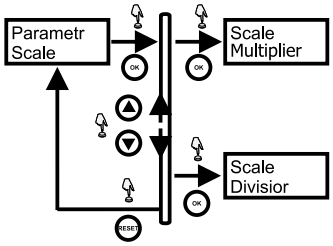
ATTENTION!

In the event that set the threshold will not be a multiple of the value of multiplication factor, signaling to achieve the desired place for the first pulse for which an indication of the value exceeds the set.

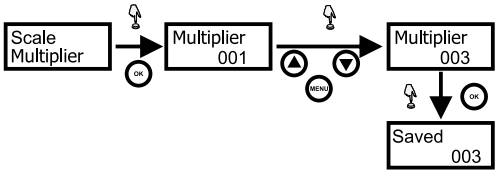
The divisior parameter specifies at which an incoming pulse will cause an increase in the meter by one. For example, setting the parameter divisor = 3, will that every third incoming pulse will increase the state of meter.



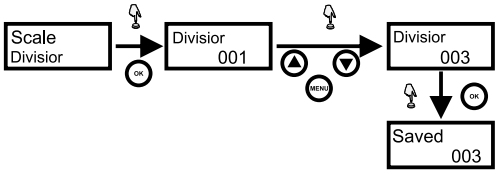
To define divisior ratio nedd following:
1. Pass to menu by press button MENU
2. By buttons UP and DOWN pass to Menu -> Parameter iand press OK.
3. Next by buttons UP and DOWN select Parameetr -> Scale and enter by OK
4. Select parameter Multipier and Divisior and press OK..



Edition of scale raio is present an example set Multplier ratio is make following:
1. After enter menu Scale > Multiplier by button OK program pass to editiom parameter mode, it is indicated by blinking a cursor on position of digit which is editing.
2. Next by buttons UP and DOWN set correct value for editing digit and move to edit next digit by button MENU.
3. In this way set all digits and enter by OK.
4. Save all changes is indicated by message SAVED with new value.
5. Possible is out from edition of scale ratio without save changes by button RESET, it cause return to menu Parameter -> Scale.



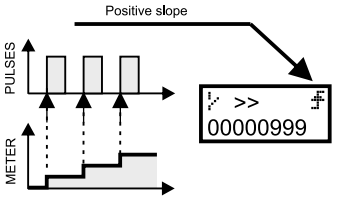
In the same way, set value for divisior

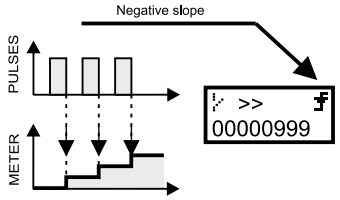


The setting determines the final implemented scales parameter. That is, if the multiplier was first set and then the divisor, the system will count pulses divisor value.

Parameter -> Slope

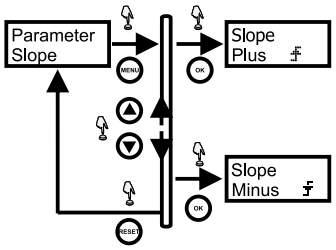
Slope parameter allows you to specify which edge pulse (positive increasing, decreasing or negative) will cause a change in the meter





Selected slope, which reacts to the meter at work is indicated by the appropriate symbol in the upper right side of the display, which is shown in the above picture

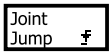
To set parameter SLOPE need to:
1. Pass to menu by pressing button MENU.
2. By buttons UP and DOWN select MENU > Parameter and press OK.
3. By buttons UP and DOWN select Parametr -> Slope and press OK.
4. By buttons UP and DOWN select Positive slope or Negative slope and enter by OK.
5. Save changes is indicated by message SAVED with new value.
6. Possible is out from edition mode without save changes by button RESET.



Parameter -> Joint

Menu Joint sets out how to relay the answer to achieving the set value by the meter. There are three options

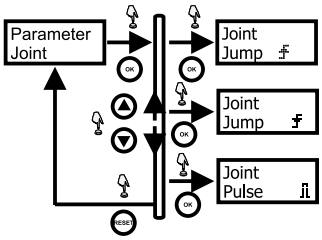
Positive Jump means that the normal state is the state of the relay off (joint opens). In contrast, when you reach the desired state of the relay passes on (pin closed) and remains in that state until the give signal RESET.



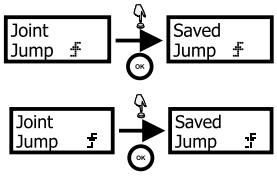
Negative Jump means that the normal state is the state of the relay off (joint close). In contrast, when you reach the desired state of the relay passes on (pin closed) and remains in that state until the give signal RESET.

Pulse means that the normal state is the state of the relay off (joint opens). After reaching the desired state of the relay passes on (joint closed) and remains in that state by the desired time (from 0.1s to 999.9s), and then passed back to the off (joint opens).

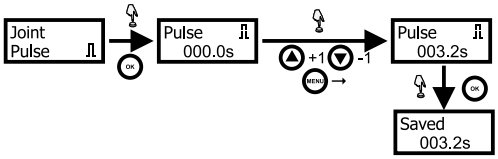
Set to value of parameter JOINT, need to:
1. Pass to menu by button MENU.
2. By buttons UP and DOWN select MENU > Parameter and press OK.
3. By buttons UP and DOWN select Parameter -> Jointand press button OK.
4. By buttons UP and DOWN select correct value and enter by OK.



5. If selected option JUMP -> UP or JUMP -> DOWN, then will display one of presented above message which confirm save changes.



6. If selected option Jump -> Pulse then program pass to edit pulse time .
7. Digit which is actual edited, indicated by blinking cursor. By buttons UP and DOWN set value for this digit. Next move to edit the next digit by button MENU.
8.After set all digit, enter chanhes by button OK..
9. Possible is return to main menu without save changes by button RESET.

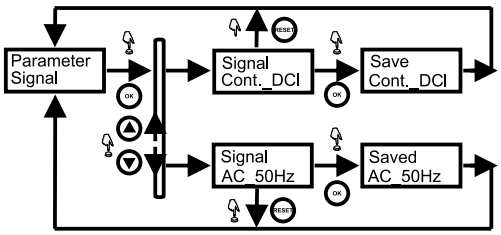


ATTENTION!

If set the meter in the mode of operation cycle at the interface between the positive and negative jump will not work, because in this case, joint status will change only for the duration of 0.1s.

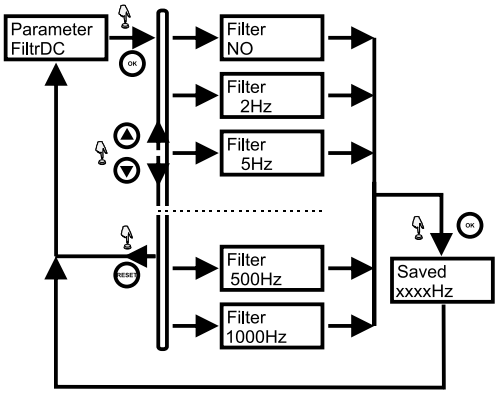
Parameter -> Signal

Menu signal determines whether to implement the counter counting pulses of DC signals or signals for the AC (with a maximum frequency of 50 Hz).
To select type of measurement signal need to:
1. Pass to menu by button MENU.
2. By buttons UP and DOWN select MENU > Parameter and press OK.
3. By buttons UP and DOWN select Parameter -> Signal and press OK.
4.By buttons UP and DOWN select correct signal Continous_DC orAC_50Hz, and enter by OK.
5. Store new value is indicated by display message SAVED with new value. After that program return to menu Parameter -> Signal.
Possible is out from edition mode without save changes by button RESET.



Parameter -> FiltrDC

FiltrDC menu is used to define the parameters of the internal digital filter. It can help reduce conting frequency pulses to the desired value, and thus reduce the possibility of system malfunction caused by interference, such as by vibration systems to the input joint of meter.Set to maximum frquency of count need to:
1. Pass to menu by button MENU.
2. By buttons UP and DOWN select MENU > Parameter and press button OK.
3.By buttons UP and DOWN select Parameter -> FiltrDC and press button OK.
4. By buttons UP and DOWN select correct cut frequency and enter by OK. Selected option do not cause turning OFF filter and counting pulses with max possible speed



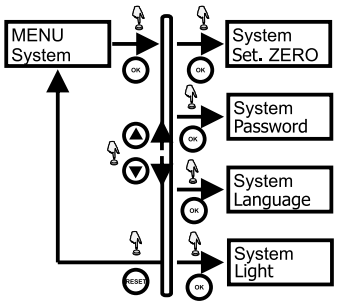
5. Remember the new parameter value is indicated by the message SAVED with the new parameter value, then program returns to the menu Parameter -> FiltrDC.
6. To exit the parameter editing without saving your changes, press the RESET button.

ATTENTION!

FiltrDC does not work if you set the meter to the signal AC_50 Hz.

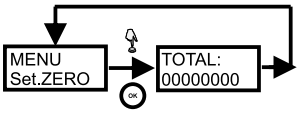
Menu -> System

This menu organizes a way of communication with the meter



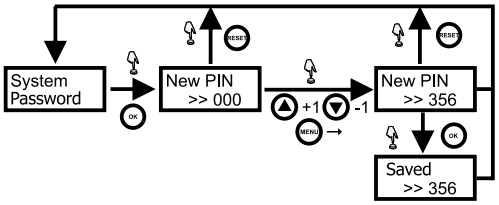
System -> Set.ZERO

This command is designed to reseting total meter value
1. By button MENU pass to main menu.
2. By buttons UP and DOWN select Menu > System and enter by button OK.
3. Next by buttons UP and DOWN select System > Set.Zero.
Enter by button OK position System -> Sey.Zero cause reset a global meter without additional messages and confirms.



System -> Password

This parameter can be used to restrict unauthorized users to access the menu meter. The password is the value of adopting a number from 0 to 999, when a password set to 0, then remove the security of meter. Setting a password other than zero introduces a meter in the secure mode. To set a password need to:
1. By button MENU pass to main menu.
2. By buttons UP and DOWN pass to Menu > System and enter by OK.
3. By buttons UP and DOWN select menu System > Password and press button OK.
4. Meter is in set new value mode of PIN code, it's indicated by message New PIN. Password is placed in the public domain, and the value of starting the previous by older password.
5. By buttons UP and DOWN set correct value of next digit. By button MENU pass to edit next digit. When all digit are entered, then enter a new PIN code by button OK.
6. Possible is out from password edition mode without save changes by button RESET.



System make possiblity enter PIN code to any number of times to prevent the blockage of device of too many errors when entering a password.
After entering the password the user has full access to the menu. In contrast, no activity by fifteen seconds (identified by the lack of pressing any button) to re-move meter in the state protected. The display mode of meter state of the system isn't yet secured a pulsating signaled by the key. When the meter goes into the state-protected, the key is displayed on an ongoing basis.
The device hasn't implemented any special unlock passwords . In the event of being locked due to forget your password, you can delete a security giving the signal for unlocking inputs 5 and 6 at the time attached supply voltage.

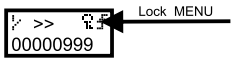
ATTENTION!

External signal doesn't permanently remove the security meter. Once again the power PIN code is enabled

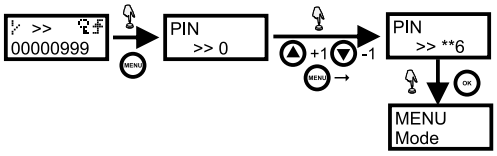
System -> Language

This parameter make possiblity to choose language in wich will display information .You can choose polish, english, russian language.
1. By button MENU pass to main menu.
2. By buttons UP and DOWN select Menu > System and enter by button OK.
3. By buttons UP and DOWN select menu System > Language and press button OK.
4. From language list by buttons UP and DOWN select correct language and enter by button OK. Confirm of change a language is displayed in new language.
5. Possible is out from choose language option without set changes by button RESET.

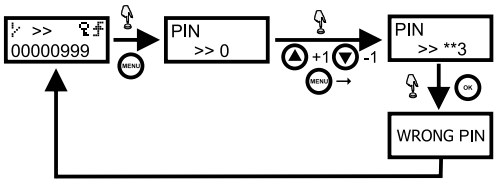
After setting a password, access to the menu meter is protected against unauthorized access. This is indicated on the display of the symbol key which is placed in the right top of the display.

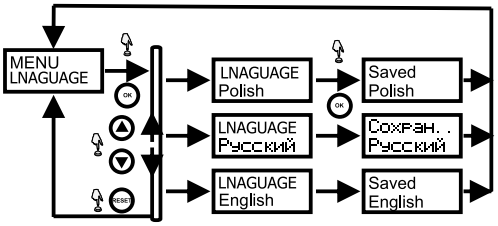


From this moment when yoy need pass to configuration menu need to enter correct PIN code after press button MENU.



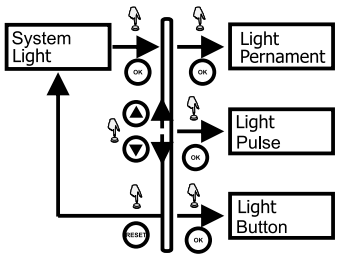
The PIN is introduced here as a secret. It mean a digit which is edit is visible, but two digits are hidden by asterisks mark. If will enter an incorrect PIN code then will be displayed message WRONG PIN, and meter returns to display the current value of the meter.





System -> Light

Light parameter specifies how the light meter will display. There are three options:
a. On permanent, display is always illuminated
b. Pulse, display will be illuminated for ten seconds after the pulse is identified, or sixty seconds after you press the button on the keyboard and during reset the meter.
c. The keypad, display will be illuminated for 60 seconds after pressing the button on the keyboard, or during reset the meter. After completion of the assignment (ie after deduction of a specified quantity of pulses) display flashes three times and remains on (if the option is selected to solid illumination) or off (in other cases).
To determine the behavior of the display you should:
1. By button MENU pass to main menu.
2.By buttons UP and DOWN select Menu > System and enter by button OK.
3. By buttons UP and DOWN select System > Light and press OK.
4. From the available list of parameters by buttons UP and DOWN select correct parameter and enter by button OK.
5. Possible is out from parameter edition mode without save changes by button RESET.



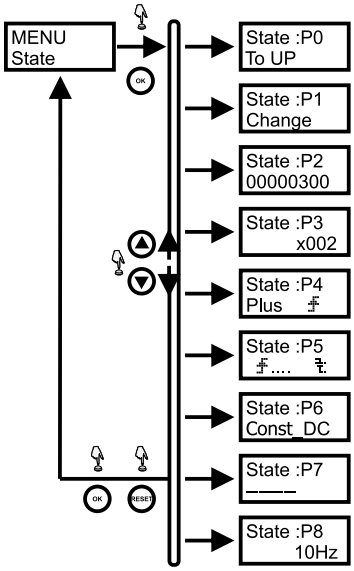
Menu -> State

State Menu includes compiled in one place all the important settings meter (read-only mode).

New factory is supplied with the meter defined following the initial settings:

PARAMETER	*INITIAL VALUE*
mode	*loop*
threshold	*0*
signal	*const_DC*
filter	*100Hz*
slope	*positive*
joint	*pulse1sec*
light	*button*
language	*polish*

To go to the preview settings:
1. By button MENU pass to main menu.
2. By buttons UP and DOWN select Menu > State and enter by OK
3. By buttons UP and DOWN can preview state eight primary settings of meter.
4. Possible is out from preview settings by press button OK. or RESET.



Structure of menu State:
State :P0) Signaling work mode of meter (For the UP or DOWN). The value of the parameter is set in Menu -> Mode.
State :P1) DDITIONAL options presented in the case of work in themeter mode. This parameter is set in the mode menu -> Mode. In the event that the meter is set to down mode, the parameter P1 indicates the null (--------)

State :P2) Set value of meter. Parameter set inmenu Parameter -> Threshold.
State :P3) Value of ratio which scaling input pulses.If multiplier is set, it indicates themeter on the second line of the symbol x with the value of the multiplier. Divisor is indicated by a sign on the second line of the display, followed by the divisor. The value of skalującego is set in the parameter -> Scale.
State :P4) Demonstrated by the slope (positive or negative) impulse response is the meter. The value of this parameter is determined in the Parameter-> Slope.
State :P5) Specifies what type of shares will take place after the relay reaches the desired value of the meter. This parameter is defined in the parameter -> Joint.
State :P6) Show which points will be counted ,AC or DC signals. Parameter is set in the Parameter -> Signal.
State :P7) State os additional meter, and used internally by the meter, if is set option divisor. When the multiplier is selected, it shows the value of this parameter blank (--------).
State :P8) If you work in pulse counting mode for DC signals indicate the status of P8 set cut-off frequency of the digital filter. If the filter is turned off, the second line of the message doesn't appear. Digital filter is set in the parameter -> FiltrDC. In the event that the meter is set for the measurement of AC signals, it will indicate the status of P8 null (---).

ATTENTION!

When is programming the meter, or changing its settings, you must pay attention to the settings of all parameters of the Menu -> Mode and Menu -> parameter. This is to avoid errors associated with the work not conform to the expectations meter.

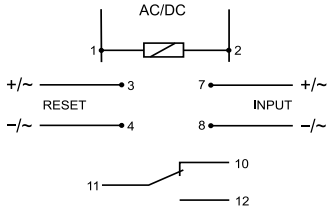
ASSEMBLY

1. Take OFF the power of switchgearbox in which the device will be attached.
2. Put on device on the rail.
3.Connect power cable to joint 1 iand2.
4.Connect other cable with wiring diagram.Podłączyć pozostałe przewody, zgodnie ze schematem. Please note that in the case of work with DC signals, it is important to preserve the appropriate polarity.

TECHNICAL DATA

supply	*24÷264V AC/DC*
INPUT: voltage - low state	*0÷5VAC/DC*
volyage - high state	*10÷264VAC/DC*
frequency for signal DC	*<5kHz*
frequency for signal AC	*<50Hz*
RESET: voltage	*24÷264V AC/DC*
current load of joint 1P	*8A*
power consumtion	*1,5W*
working temperature	*-20÷50°C*
connection	*screw terminals 2,5mm²*
dimensions	*3 modules (52,5mm)*
fixing	*on railTH-35*

WIRING DIAGRAM



ATTENTION!

Do not make yourself any change in the device. It may cause damage to equipment or improper work, which can lead to damage of the controlled device, and the risks for people handling. In such cases, the manufacturer isn't liable for any event and may refuse the warranty given to the relay in case of filing a complaint.

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