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5. The package contains

- AM4080 - 1 pcs.
- Mounting kit - 1 pcs.
- User manual - 1 pcs.

6. Manufacturer

Gineers Ltd
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7. Fault Table

#	Date	Fault	Description of the repairs	Signature

Ammeter **AM4080**　　　　　**Series 4080**

User Manual

AM4080 is digital measurement, fully programmable device from series 4080. It measures current up to 10 AAC/ADC and can measure other current by connecting external shunt resistor or current sensor. AM4080 can be directly connected to current transformer with maximum secondary current of 10Aac. The device can be purchased with potential-free contacts for remote signalization if measured current goes out of certain programmable limits (option "R"). AM4080 is designed to be mounted on boards in control rooms of electrical substations.

1. Main technical parameters

- measured current – alternating/direct
- max input current - 10 AAC/ADC (overload up to 10 times for 100ms)
- power supply – 55-270 VAC (80-390 VDC)
- input resistance – max 0.010 Ω for 5 A
- display – super bright red, 4 digits, view area 75x22mm, purple filter
- measurement error - <1.2 % rdg + 2 digit
- single measurement cycle - < 1 s
- menu protection – yes/no
- user menu access code: **1342/**..........
- potential-free contacts number – 3 N.O. – yes/no
- max. contact voltage/current – 0.5 ADC @ 220 VDC
- power consumption - max 3 W
- work ambient temperature - 0÷50 °C
- storage temperature - -50÷+90 °C
- влажност на въздуха - 40÷90 %
- dimensions (H/W/D) –48/96/85 mm (w/o plugs attached) и 48/96/95 mm (w/t plugs attached)
- mounting hole (H/W) – 43/90 mm, centered
- IP protection class – IP52 front (mounted on board), IP31 back
- weight – 220 g

2. AM4080 Work

AM4080 starts working immediately after power up as described:

Initialization Mode
- Decimal point of least significant digit lights for about 0.2s
- Display shows moving "Gineers" - for about 3s.
- Display goes blank, then shows the nominal input current – for about 1.5s
- The device enters normal work mode – shows instant measured current, one of the LEDs (low/normal/high) is lit, and if the device is with "R"-option – one of the relay contacts is closed.
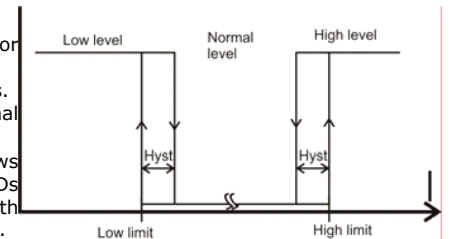

fig. 1

Work mode
The device shows the instant measured current (related to the primary side of the current transformer, if one used) and continuously monitors and signals if its value is within certain programmed limits (low/hi) via front panel LEDs and relay contacts. If the value is outside these limits, the display blinks with frequency about 2-3Hz (blinking can be turned off via user menu). The device alarms for value outside limits after time, set as number of consecutive measurements out of the limits. It is made this way in order to avoid the possibility of false short-time signaling. Then, for entering back into

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normal limits, the current must be within the limits plus programmed hysteresis value, as shown on fig.1. There is no time delay when returning to "within limits" mode.

AM4080 programming

AM4080 can be programmed via user menu. The user can enter in the menu by pressing the "**OK**" key when the device is in normal working mode. IT IS FORBIDDEN to press any key when the device is in initialization mode! If AM4080 is with option "**C**" (AM4080C), the menu requires user code ; the display shows 'uSEr', until "**OK**" key is depressed. After that the display shows "codE" and the device waits for four-digit user code to be entered. If the entered code is valid, then the user is allowed to the menu; and if the code is invalid, the user cannot have access to the menu and the device returns back to normal working mode. Entering the code is basically four-digit parameter edit (see below). If the device is without option "C", user code is not required and the user is allowed to the menu, the display shows the first parameter in the menu (diSP).

User menu parameters:
– nominal (primary) current (diSp)
This is the value the display shows at nominal input current, i.e. this parameter along with the next (decimal point position) determine the nominal input current when current transformer is used (set '1000' if the connection is direct).
– decimal point position (dP)
– low level (Lo)
Below this level of input current AM4080 signals for value below limits – with LED and relay
– high level (Hi)
Over this level of input current AM4080 signals for value above limits – with LED and relay
– display blinking when value is outside programmed limits (bLin)
turns on/off display blinking if the value is outside programmed limits
– hysteresis (HYSt)
This is the difference between current entering and exiting "value outside limits" mode ad signalization
– signalization delay (rdEL)
This is the number of consecutive measurements before the device signals that the current is outside programmed limits

When entering user menu the display shows "diSP" – the first parameter in the menu. Other parameters can be chosen by pressing '↗' key, and editing the chosen parameter can be done by pressing '**OK**' key. Exiting the menu can be done only if parameter is not edited at the moment (i.e. the user can exit the menu only when choosing parameter to edit) by pressing and holding '↗' key and briefly pressing '**OK**' key when '↗' is pressed. After exiting the menu AM4080 continues to work normally.

IMPORTANT: When the device is in the menu, it does not measure input value and therefore does not alarm if the value is – or it is not – within the programmed limits. All of the signals remain as they were prior entering the menu!

Parameter editing – if the parameter is chosen by '↗' key, with '**OK**' key the user can edit the parameter. If the parameter has several digits to be entered, with both the keys the digits are edited one by one: after entering "parameter edit" mode the display shows the current value of the parameters and the most significant digit is blinking. Blinking of the digit means that it is the current edited digit, and pressing '↗' key increments it with 1. After reaching '9' incrementing the digit resets its value to '0'. Pressing '**OK**' key confirms the value of this digit and goes to the next digit, which now blinks. After confirmation of the last digit the parameter is saved and the user goes back to the menu to select another parameter to edit.
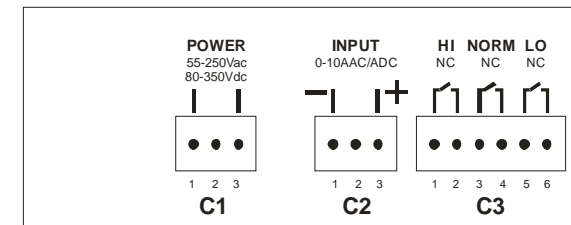
If the parameter to edit has several values or options, then with '↗' key the user can go round all the options/values and when selects the correct one, confirms it with the '**OK**' key and goes back to the menu.

This table shows the factory default settings and limits for all the parameters in the menu:

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Parameter(submenu)	Display	Limits	Default value
Nominal primary current	diSP	0000-9999	1000
Decimal point position	dP	1.000-1000	10.00
High level	Hi	0000-9999	1200
Low level	Lo	0000-9999	0800
Display blinking	bLin	on/oFF	On
Hysteresis	HYSt	0000-0099	0010
Relay delay	rdEL	0000-0099	0008

3. Mounting and electrical connection

AM4080 should be mounted on board with opening 43x90mm with mounting kit, supplied with the device. All connections must be made with isolated cables with cross sectional area of 0.75mm²÷2.5mm². The connections are shown on the next figure:

C1 'Power'

No	Description
1, 3	Power supply
2	Not used

Input current'

No	Description
1	Input current, minus /shunt input minus
2	Не се използва
3	Input current, plus /shunt input plus

C3 'Relays'

No	Description
1,2	NO-contact "high value"
3,4	NO-contact "normal value" (value within limits)
5,6	NO-contact "low value"

IMPORTANT: Only qualified personnel, familiar with safety instructions and this user manual should be allowed to work with AM4080!

4. Warranty

The warranty of the device is limited to two years from the date of sale. If the device shows any defect or malfunctions during that period, the manufacturer is obligated to repair the device in its own service for manufacturer's expense, or, if the repair is impossible, to replace the device with new one. The transportation costs to the manufacturer's service are due to the client. The warranty voids if this manual instructions are not met, warranty seals are removed or the device was opened by unauthorized by the manufacturer personnel.

Serial number:....................   Date of sale:.......................

                                          Signature:..........................