Picture **1.**

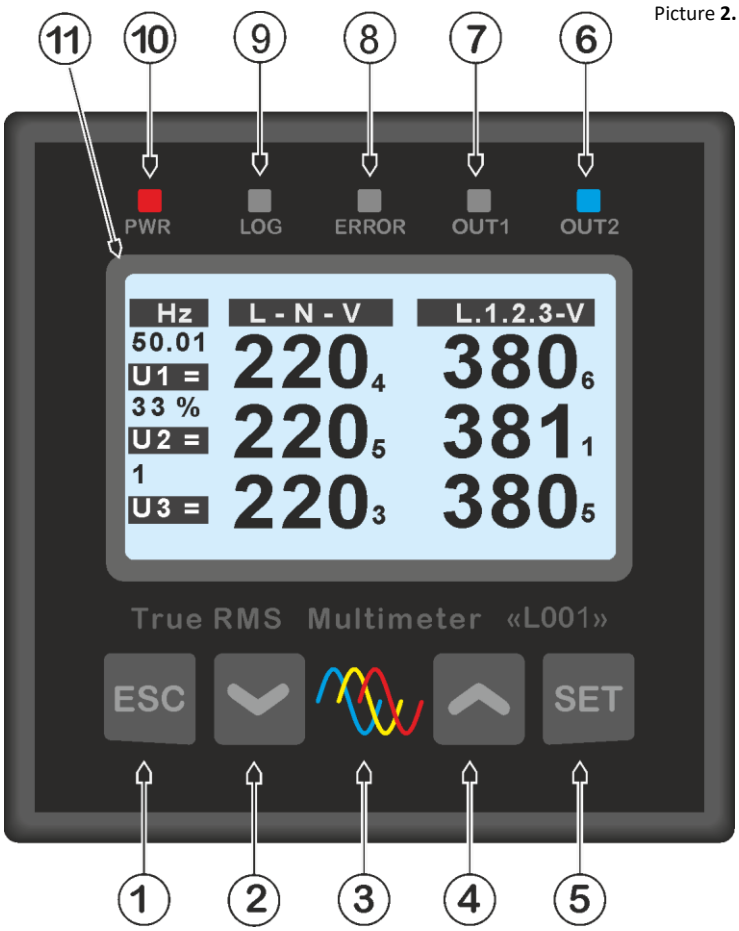
Multimeter « L-001 » Lankon.

Technical Instructions and User Manual.

Purpose of the measuring device.

This digital multimeter is designed to measure, analyze, and protect the loads connected to three-phase AC electrical networks. Equipped with the latest technology, this device comes with user-friendly menus and all the necessary features. All the information and warnings you need to know about the device are detailed in the user manual. Please, for the safety of your system and yourself, read this manual carefully before operating the device. If there are any unclear issues, do not proceed without contacting our company.

Picture **2.**



General Structure.

The device is manufactured in a durable plastic case with dimensions of 96x96 mm. The front panel features five warning LEDs, four buttons, and a graphic display with a resolution of 128x64 pixels. The main monitoring page of the device is shown in Picture 2. The rear panel includes four 5.08 mm socket female terminals for easy connection, on which empty male terminals are mounted.
The device is equipped with two sliding plastic lugs for easy mounting on the panel.

Front Panel Description.

1. ESC Button: Used to exit the settings menu.
2. ALT Button: Used to navigate between sub-menus.
3. LOGO: The logo of the device brand.
4. UP Button: Provides upward navigation through the menus.
5. SET Button: Used to save settings and confirm menu options.
6. Relay 2 LED (OUT2): Displays the status of the second relay output.
7. Relay 1 LED (OUT1): Displays the status of the first relay output.
8. Error LED (ERROR): Activates when there is an error in the system.
9. Data Recording (LOG): Indicates that measurement data is being recorded.
10. System Power Supply (PWR): Activates when the system has sufficient power supply.
11. Graphic Display (128x64): Shows measurement values and system information.

Rear Panel View and Description.

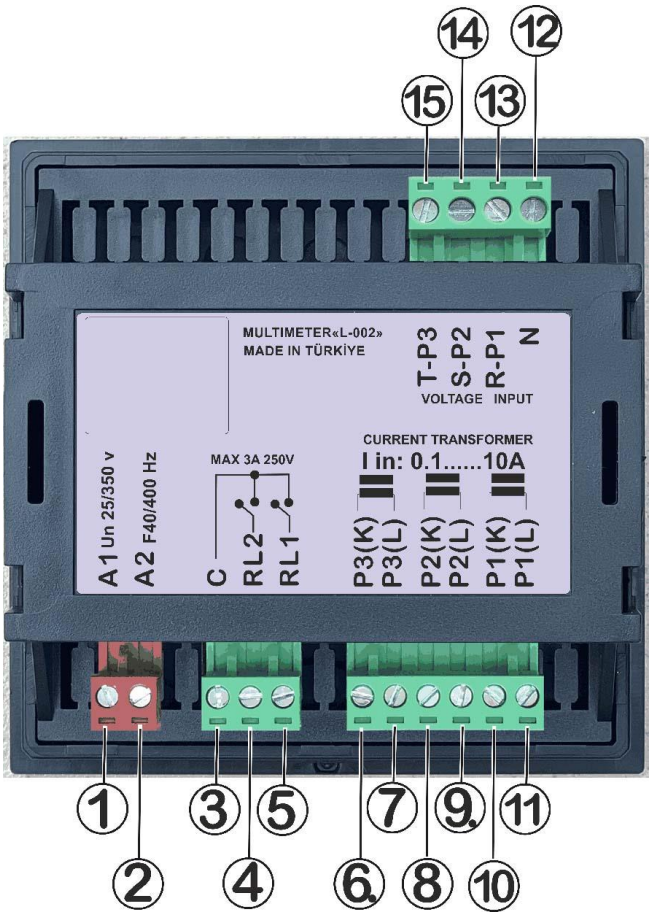
1. **Neutral Power Input: Used for the neutral connection to the device.**
2. **Power Input: Phase (25…350V) AC.**
3. **Common Relay Output: Common output point for relays.**
4. **Relay 2 Output: Used to activate various devices controlled by the system.**
5. **Relay 1 Output: Used to activate various devices controlled by the system.**

Current Transformer Inputs (Phase 1, Phase 2, Phase 3):
Separate current transformer inputs for each phase.

6. Phase 1 Current Transformer Input 1.
7. Phase 1 Current Transformer Input 2.
8. Phase 2 Current Transformer Input 1.
9. Phase 2 Current Transformer Input 2.
10. Phase 3 Current Transformer Input 1.
11. Phase 3 Current Transformer Input 2.

Voltage Measurement Inputs (for Phases and Neutral):
Inputs for measuring voltages between phases and with neutral.

12. Neutral voltage measurement input for phases.
13. Phase 1 voltage measurement input.
14. Phase 2 voltage measurement input.
15. Phase 3 voltage measurement input.



Picture **3.**

Model and Features .

There are four different models of the device, and each model has some specific features:

L-001: Equipped with features for frequency, three-phase voltage, and three-phase current. Additional features such as Wi-Fi, temperature sensor, RS-485, and MODBUS-RTU are not available.

L-002: Retains the other basic features, includes three temperature sensors.

L-003 and L-004: Equipped with more advanced features and specifically designed for industrial use.

Model	Features							Not
	FREQUENCY	THREE PHASE VOLTAGE	THREE PHASE CURRENT	Wi - Fi	HEAT SENSOR FOR ALL THREE PHASES	RS-485	MODBUS-RTU	
L-001	✓	✓	✓					
L-002	✓	✓	✓		✓			
L-003	✓	✓	✓	✓	✓			

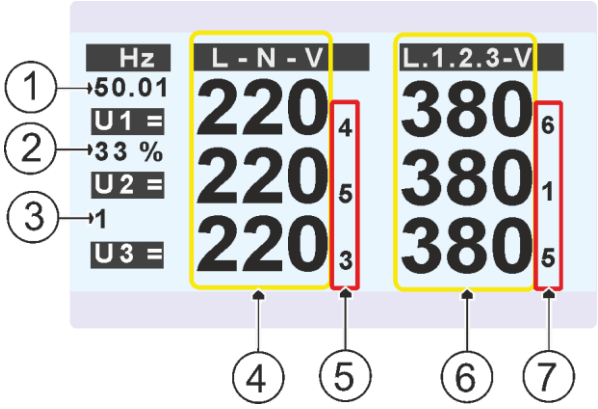
L-004	✓	✓	✓	✓	✓	✓		

On the Main Screen, Monitoring Measurements.

To monitor the parameters, the device has 11 different main monitoring pages available.
Transitions between pages are made by briefly pressing the 'UP' and 'DOWN' buttons.
The explanation of the values shown on the screen pages is as follows, showing the parameters and system information.

Main Screen Page « 1 »

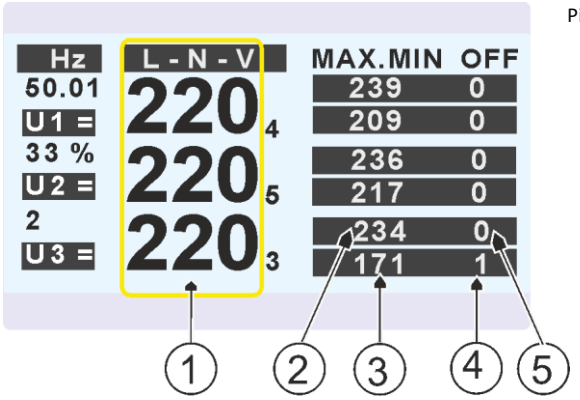
1. Network Frequency.
2. Three-Phase Current Percentage.
3. Screen Page Number.
4. Voltage Value Between Three Phases and Neutral.
5. Decimal Part of the Voltage Value Between Three Phases and Neutral.
6. Voltage Value Between Phases.
7. Decimal Part of the Voltage Value Between Phases.



Picture **4.**

Main Screen Page « 2 »

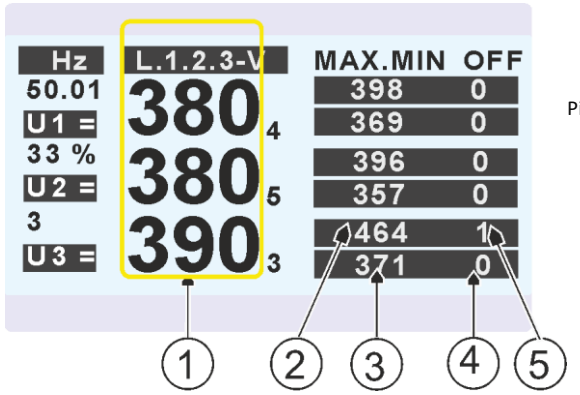
1. Voltage Value Between Three Phases and Neutral.
2. Highest Recorded Voltage Value Between Three Phases and Neutral.
3. Lowest Recorded Voltage Value Between Three Phases and Neutral.
4. Number of Voltage Interruptions Due to Low Voltage Between Three Phases and Neutral.
5. Number of Voltage Interruptions Due to High Voltage Between Three Phases and Neutral.



Picture **5.**

Main Screen Page « 3 »

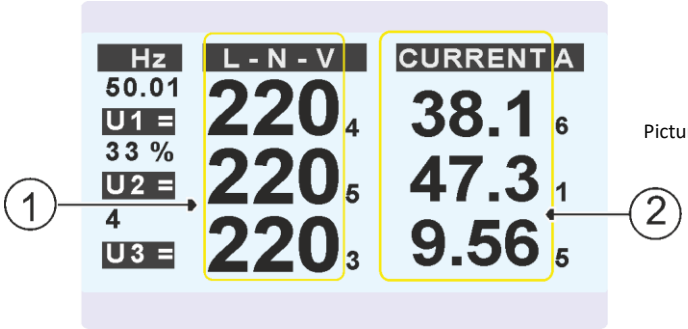
1. Voltage values between phases.
2. Highest recorded voltage value between three phases.
3. Lowest recorded voltage value between three phases.
4. Number of voltage interruptions due to low voltage between three phases.
5. Number of voltage interruptions due to high voltage between three phases.



Picture **6.**

Main Screen Page « 4 »

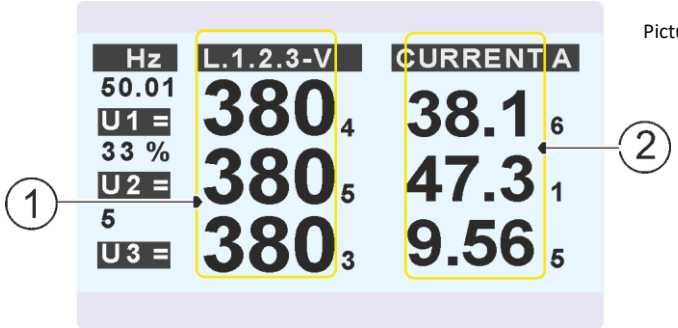
1. Voltage value between three phases and neutral.
2. Three-phase current value.



Picture **7**.

Main Screen Page « 5 »

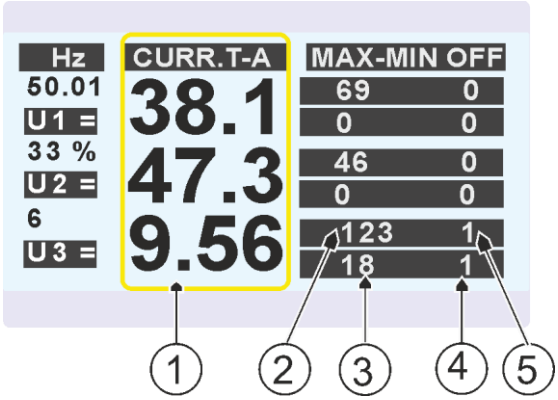
1. Voltage value between phases.
2. Current value.



Picture **8**.

Main Screen Page « 6 »

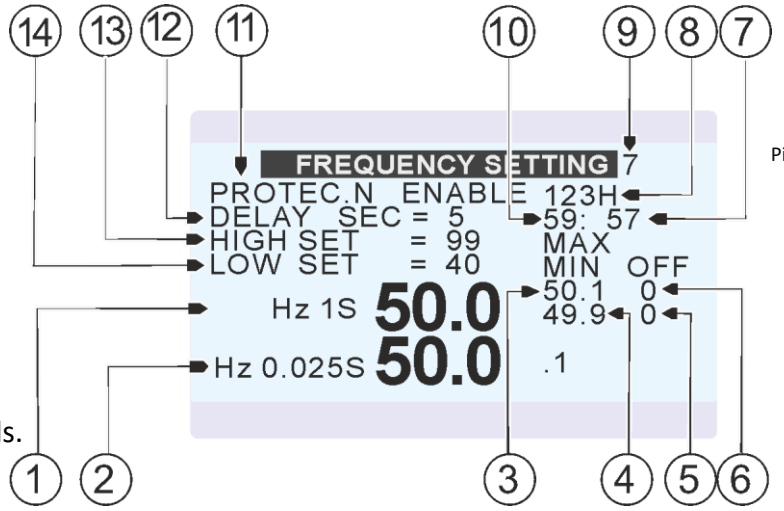
1. Three-Phase Current Value.
2. Highest Current Value Recorded in Three Phases.
3. Lowest Asymmetric Current Value Recorded in Three Phases.
4. Number of Shutdowns Due to Asymmetric Current (Protection).
5. Number of Protections (Shutdowns) Recorded in Three Phases Due to High Current.



Picture **9**

Main Screen Page «7»

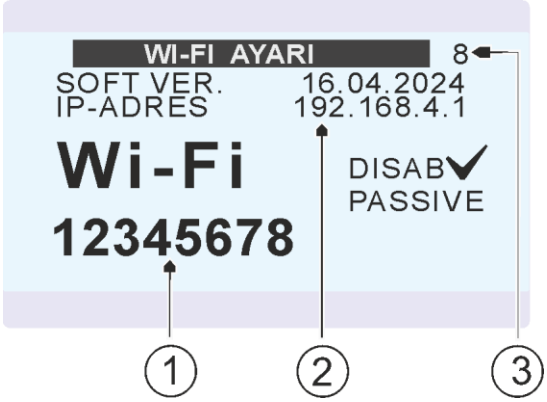
1. Frequency: per second.
2. Frequency: per 0.025 second.
3. Highest Recorded Frequency Value.
4. Lowest Recorded Frequency Value.
5. Number of Shutdowns Due to Low Frequency.
6. Number of Shutdowns Due to High Frequency.
7. Active Usage Time, Seconds.
8. Active Usage Time, Hours.
9. Screen Page Number.
10. Active Usage Time, Minutes.
11. Frequency Protection Status: Active/Passive.
12. Frequency Protection Delay Time, Seconds.
13. Upper Frequency Protection Value.
14. Lower Frequency Protection Value.



Picture **10**

Main Screen Page « 8 »

1. Wi-Fi Password.
2. Wi-Fi IP Address.
3. Screen Page Number.

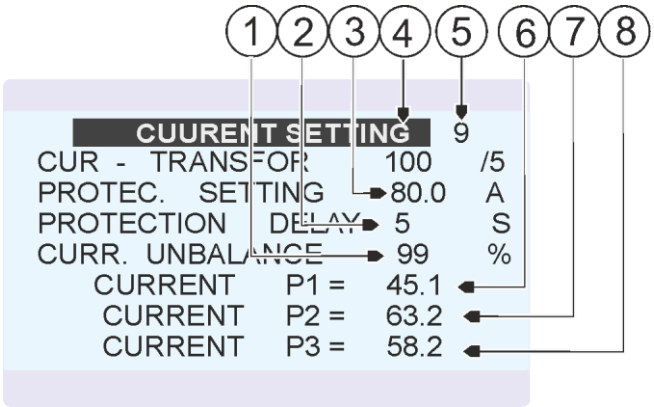


Picture **11.**

Main Screen Page « 9 »

1. Asymmetric Current Protection Ratio.
2. Current Protection Delay, Seconds.
3. Current Protection Value.
4. Current Measurement Transformer Ratio.
5. Screen Page Number.
6. Phase 1 (P1) Actual Current Value.
7. Phase 2 (P2) Actual Current Value.
8. Phase 3 (P3) Actual Current Value.

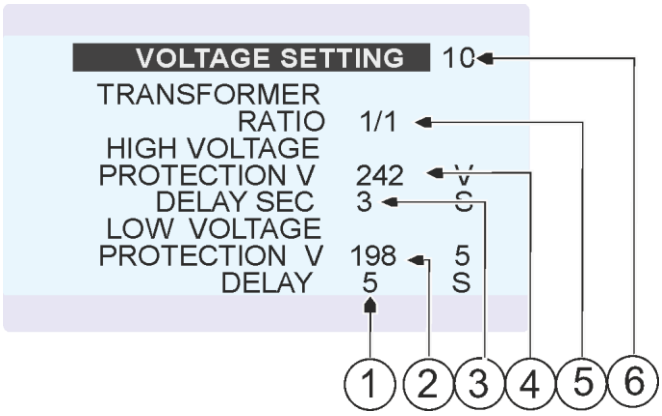
Picture **12.**



Main Screen Page « 10 »

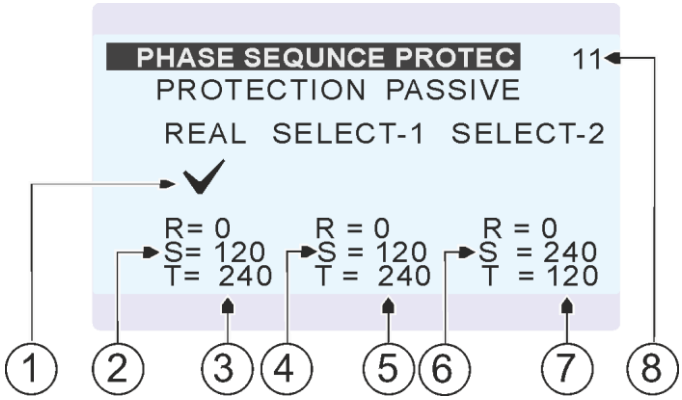
1. Low Voltage Protection Delay, Seconds.
2. Low Voltage Protection Value.
3. High Voltage Protection Delay, Seconds.
4. High Voltage Protection Value.
5. Voltage Measurement Transformer Ratio.
6. Screen Page Number.

Picture **13.**



Main Screen Page « 11 »

1. Permitted Phase Sequence.
2. Phase S, Degree.
3. Phase T, Degree.
4. Phase S, Degree.
5. Phase T, Degree.
6. Phase S, Degree.
7. Phase T, Degree.
8. Screen Page Number.



Picture **14**

SERVICE MODE: Menu Access and Settings.

To enter the menu, briefly press the "SET" button. The display will show the first 8 lines of the menu. As the arrow is moved and the 8th line is passed, the next 8 lines (lines 9 to 17) will be displayed.

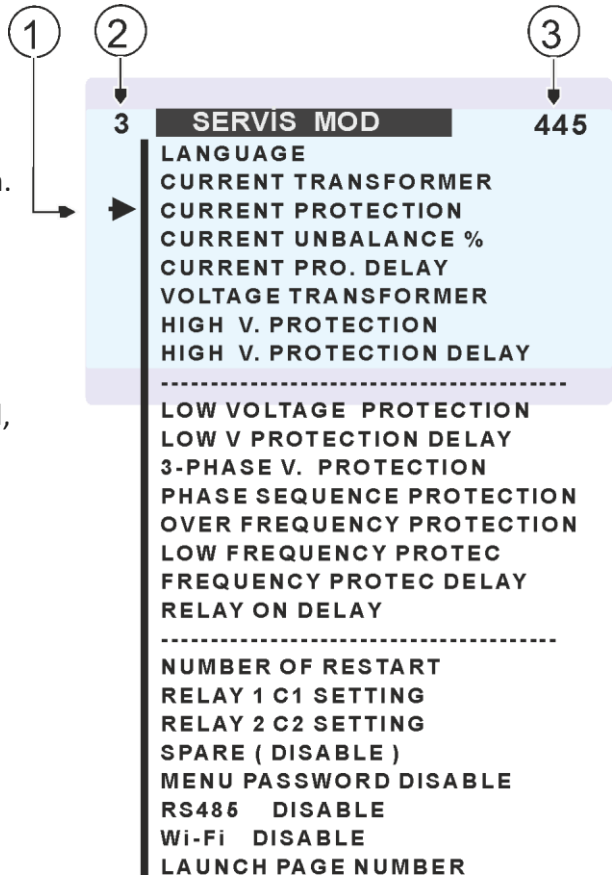
1. The arrow that is moved between lines 1 to 24 using the "UP" and "DOWN" buttons.
2. Menu Line Number.
3. Countdown timer that automatically returns to the home page.

1. To change the value on a desired line, move the arrow to the front of the parameter to be changed using the "UP" and "DOWN" buttons. When the arrow is in front of the line to be changed, pressing the "SET" button will open a new page on the screen.

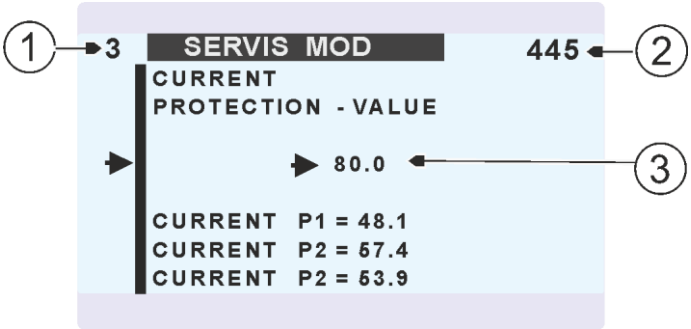
2. On the opened page, if the arrow is blinking, you can change the value with the "UP" and "DOWN" buttons. If the arrow is not blinking, you can move it to the desired menu by shifting it with the "UP" and "DOWN" buttons. Once the desired menu is reached, pressing the "SET" button again starts the arrow blinking and the value can be changed with the "UP" and "DOWN" buttons.

3. To exit the desired menu, you must use the "ESC" button. All your changes are automatically saved to memory after one minute.

"For example, in Picture 15, entry is made from line number 3.
The current protection value is changed."



Picture **15**



Picture **16**

Deleting Records.

The device records all observed parameters and does not automatically delete them from memory even after power outages.

To reset the records, the 'ESC' button must be held down for 10 seconds. During this process, a countdown will appear on the screen. When the countdown reaches zero, all records will be reset."

Dtailed Explanation of Set Parameters:

1. **LANGUAGE - LANGUAGE:** Two languages are available on the LCD screen. It is adjusted according to need.
2. **CURRENT TRANSFORMER RATIO:** If the measured value is below 5 A, there is no need to use a current transformer.
3. **CURRENT PROTECTION VALUE:** Adjusted as needed.
4. **CURRENT IMBALANCE %:** If the current value between phases exceeds the current protection value by % (***), the system activates. Especially beneficial if there are three-phase motors or voltage regulators in the system.
5. **CURRENT PROTECTION DELAY:** Adjusted as needed.
6. **VOLTAGE TRANSFORMER RATIO:** Adjusted as needed.
7. **UPPER VOLTAGE PROTECTION VALUE:** If the voltage exceeds 242v + 5v hysteresis (247v), the protection activates. The three-phase protection value changes automatically at a ratio of 1 = 1*1.7272.
8. **UPPER VOLTAGE PROTECTION DELAY:** Adjusted as needed.
9. **LOWER VOLTAGE PROTECTION VALUE:** If the voltage drops below 198v - 10v hysteresis (188v), the protection activates. The three-phase protection value changes automatically at a ratio of 1 = 1*1.7272.
10. **LOWER VOLTAGE PROTECTION DELAY:** Adjusted as needed.
11. **THREE-PHASE VOLTAGE PROTECTION:** Should be active in places with three-phase motors.
12. **PHASE SEQUENCE PROTECTION:** Should be active in places with three-phase motors.
13. **UPPER FREQUENCY PROTECTION:** Adjusted as needed.
14. **LOWER FREQUENCY PROTECTION:** Adjusted as needed.
15. **FREQUENCY PROTECTION DELAY:** Adjusted as needed.
16. **RELAY ON DELAY:** Adjusted as needed.
17. **RESTART COUNT:** If the parameter is set to 0, the relay will not shut off unless the "ESC" button is pressed after the voltage normalizes. For example, if set to 3, after the voltage has been cut three times by the system (releasing the relay and shutting down three times), either the device's voltage must be cut and restored, or the "ESC" button pressed to allow voltage back to the system.
18. **RELAY-1, C1 SETTING:** There are two relays inside the device. Each relay can be assigned a different role from the menu. Role ON-OFF/BYPASS/ALARM/FAN. Adjusted as needed.
19. **RELAY-2, C2 SETTING:** Same as parameter 18.
20. **Spare (Passive).**
21. **MENU PASSWORD-7773:** If the number is changed, when the device power is cut and restored, the menu access password activates. The system will require the correct password when you wish to re-enter the menu. The correct password is always 7773.
22. **RS-485:** Model "L-004" Active.
23. **Wi-Fi:** Can be set to Active or Passive, and the password can be changed.
24. **START PAGE NUMBER:** 1..10.

Technical parameters and operating characteristics.

Technical Specifications.	Parameter values.	Not
Operating Voltage	25 V ..... 350 V AC	
Operating Frequency	43 Hz ..... 430 Hz	
Power consumption	< 3 VA	
Voltage Input	3 V ..... 330 V	
Voltage Measurement Range	3 V ..... 330 kV	
Voltage Transformer Ratio	1 / 999	
Current Input	10 mA ..... 6 A	
Current Measurement Range	10 mA ..... 10.000 A	
Current Transformer Ratio	5A / 5A ..... 2000 A	
Accuracy measurement	± 1 %	
Storage	-40°C .... +85°C	
Operating Temperature	-20°C...50°C	
Supported Connection	3P 4W	
Communication	RS485, MODBUS RTU, Wi-Fi.	Varies depending on model
Information display	Graphic 128 x 64	Easy to read in daylight.
Weight	< 250 Gr	
Protection Class	IP41 (Panel), IP20 (Body)	
Panel Hole Size	91mm x 91mm	
Connection Type	Plug-in terminal block .	5.08 mm
Cable diameter	1.5 mm²	
Operating Altitude	< 2000 meters	

Explanation of Error Codes in the Device.

Error = 1: High voltage between the first phase and neutral.

Error = 2: Low voltage between the first phase and neutral.

Error = 3: High voltage between the second phase and neutral.

Error = 4: Low voltage between the second phase and neutral.

Error = 5: High voltage between the third phase and neutral.

Error = 6: Low voltage between the third phase and neutral.

Error = 7: High voltage between the first and second phases.

Error = 8: Low voltage between the first and second phases.

Error = 9: High voltage between the second and third phases.

Error = 10: Low voltage between the second and third phases.

Error = 11: High voltage between the third and first phases.

Error = 12: Low voltage between the third and first phases.

Error = 13: High current in the first phase.

Error = 14: High current in the second phase.

Error = 15: High current in the third phase.

Error = 16: High asymmetrical current between phases.

Error = 17: High asymmetrical current between phases.

Error = 18: High asymmetrical current between phases.

Error = 19: High frequency.

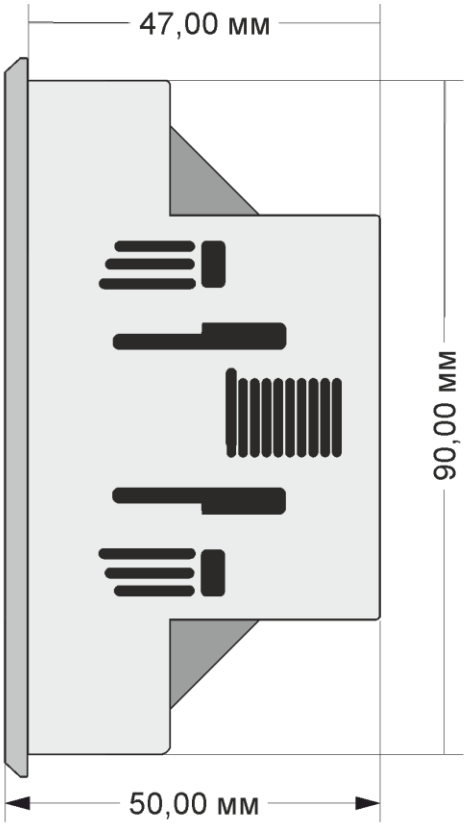
Error = 20: Low frequency.

Error = 21: Exceeded the number of resets after power cut and protective re-engagement.

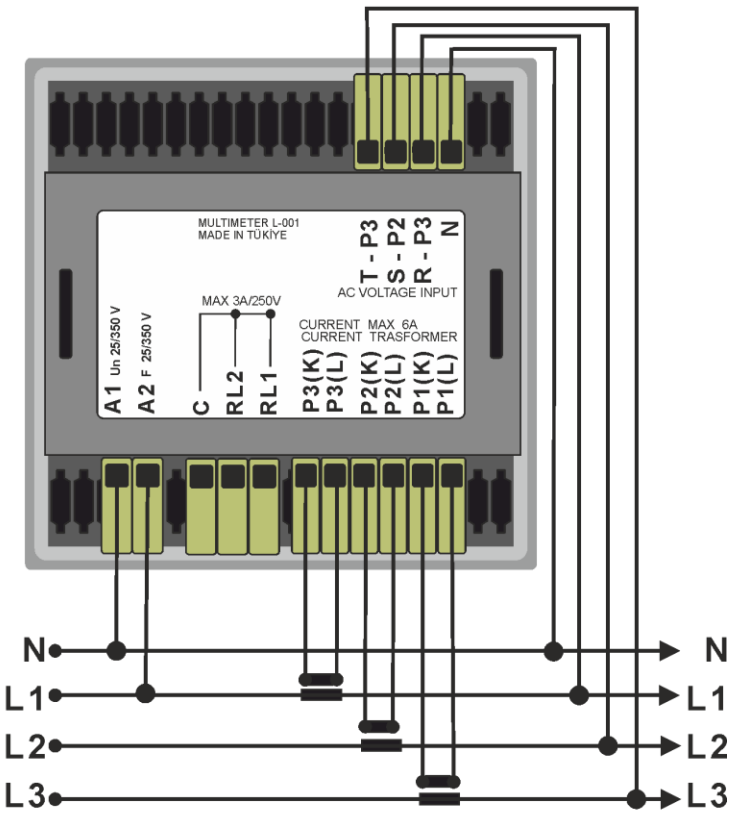
Error = 22: Incorrect phase sequence.

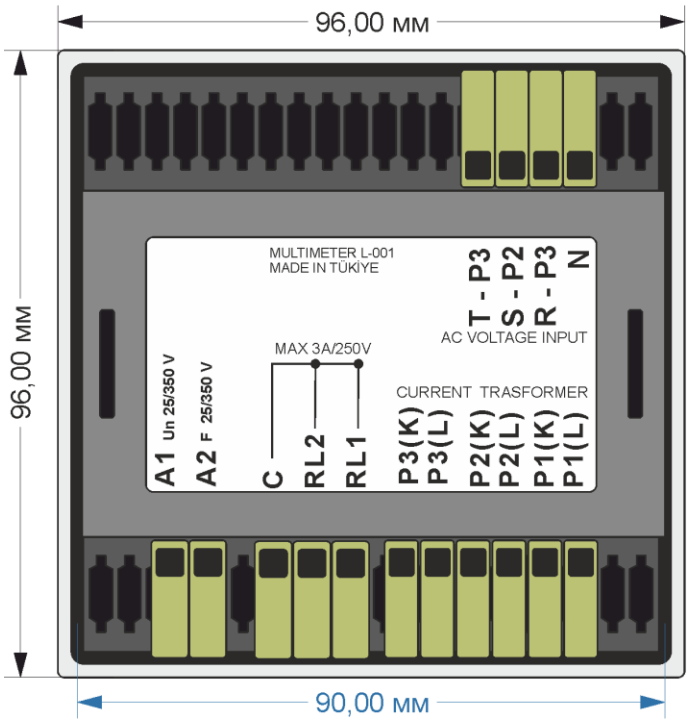
Device dimensions and technical drawing.

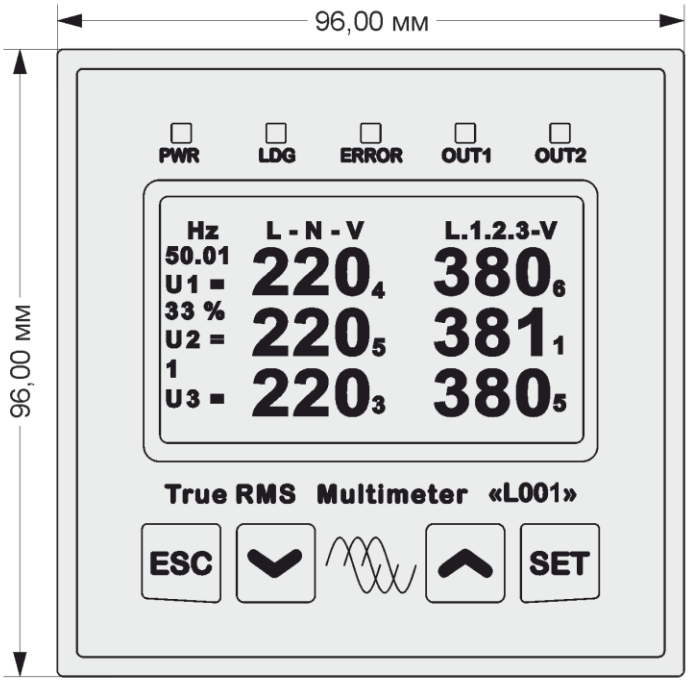
Panel Cutout Dimensions: 91 mm x 91 mm

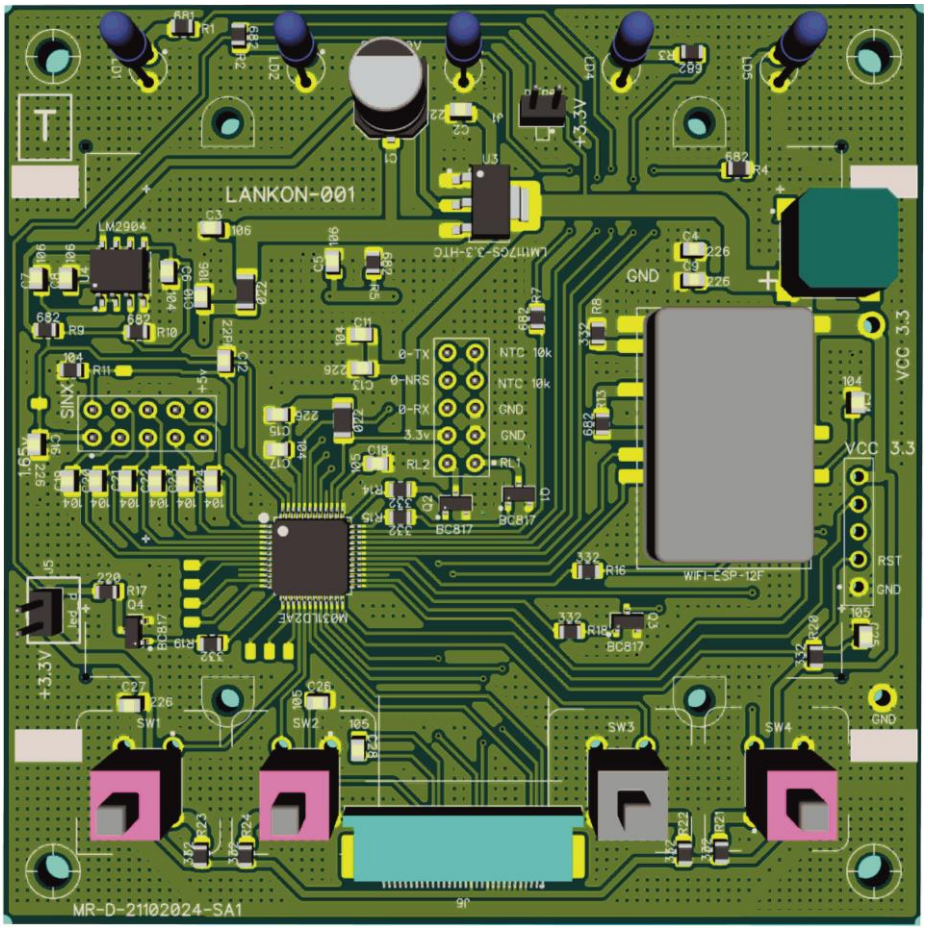


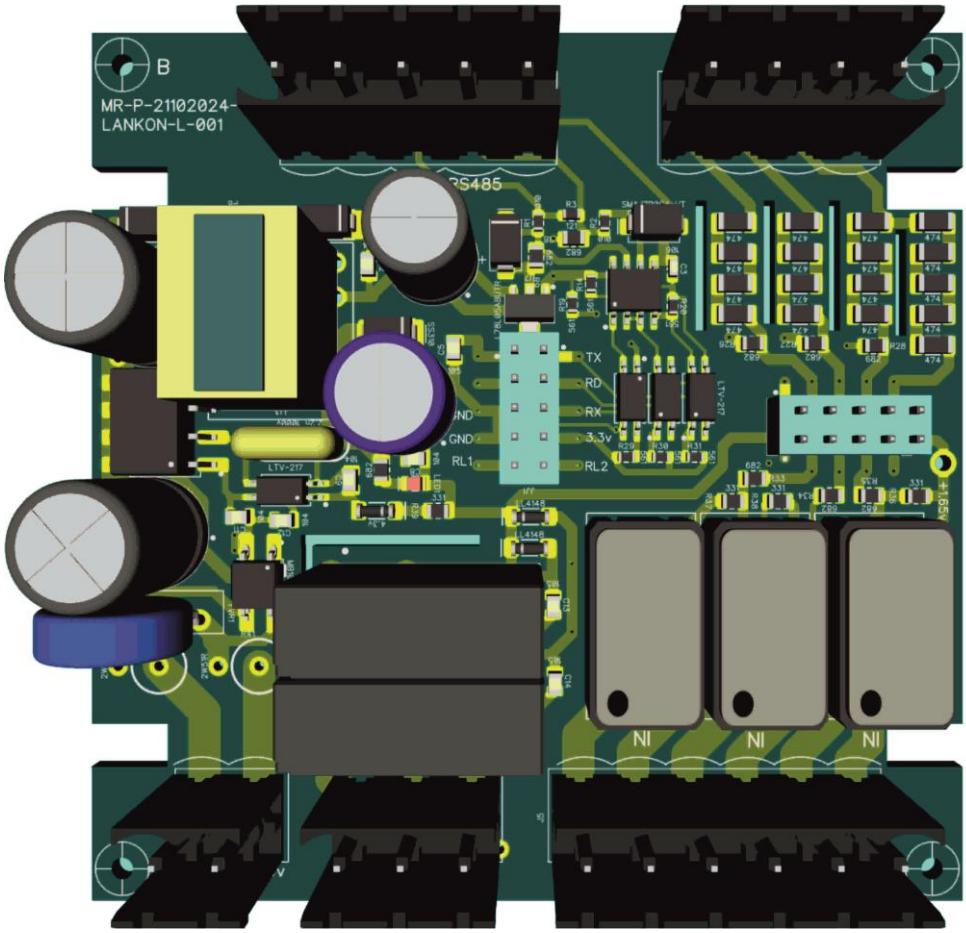
Connection Diagram. Picture **17**

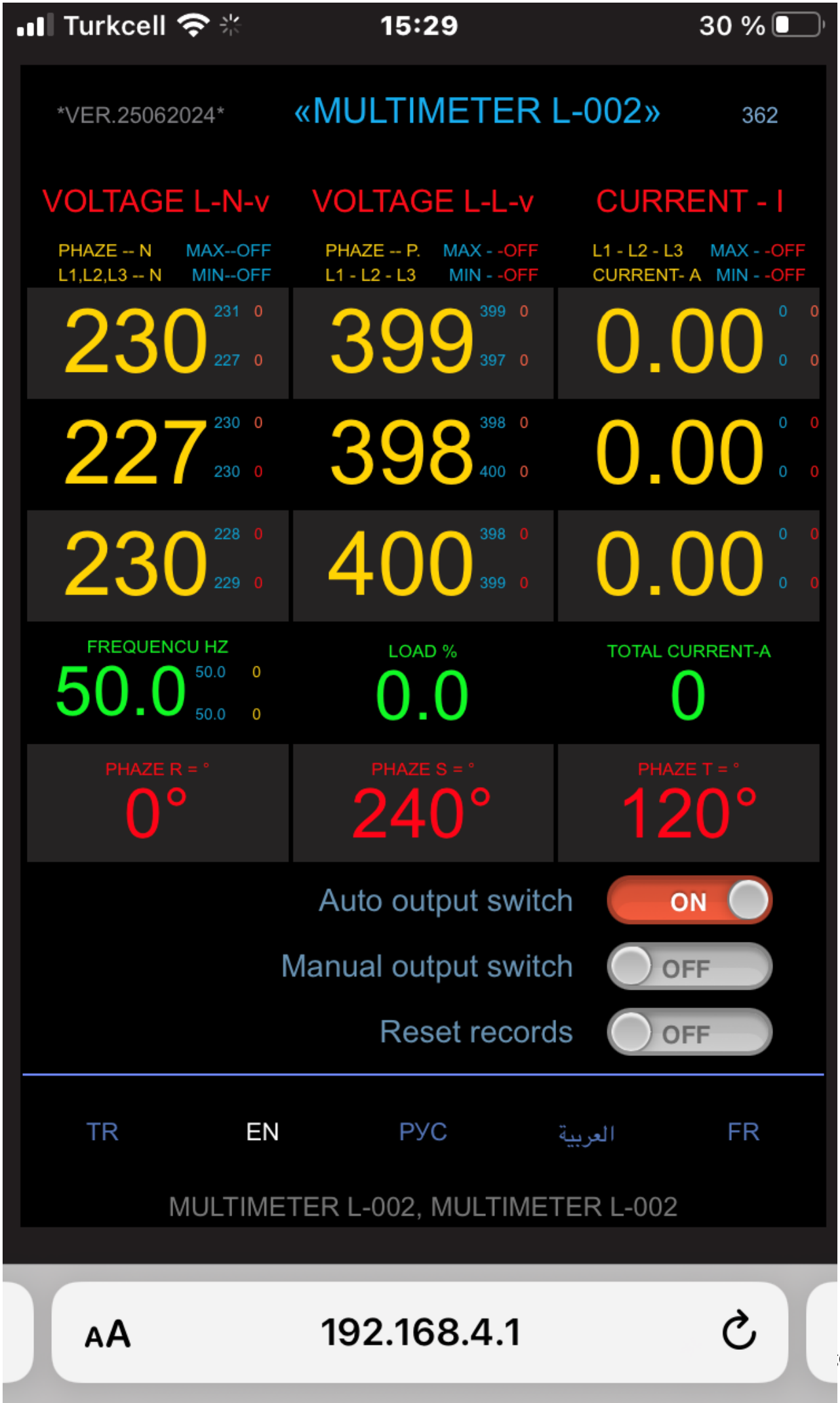







LANKON-001
MR-D-21102024-SA1
LM2904
LM117CS-3.3-HTC
WIFI-ESP-12F
VCC 3.3
GND
RST
SW1
SW2
SW3
SW4
+3.3V
NTC 10k
BC817


B
MR-P-21102024-
LANKON-L-001
RS485
TX
RD
RX
3.3v
RL1
RL2
GND
LTV-217
NI
NI
NI


Turkcell
15:29
30 %
VER.25062024
«MULTIMETER L-002»
362
VOLTAGE L-N-v
VOLTAGE L-L-v
CURRENT - I
PHAZE -- N
MAX--OFF
L1,L2,L3 -- N
MIN--OFF
PHAZE -- P.
MAX - -OFF
L1 - L2 - L3
MIN - -OFF
L1 - L2 - L3
MAX - -OFF
CURRENT- A
MIN - -OFF
230 231 0 227 0
399 399 0 397 0
0.00 0 0 0 0
227 230 0 230 0
398 398 0 400 0
0.00 0 0 0 0
230 228 0 229 0
400 398 0 399 0
0.00 0 0 0 0
FREQUENCU HZ
50.0 50.0 0 50.0 0
LOAD %
0.0
TOTAL CURRENT-A
0
PHAZE R = °
0°
PHAZE S = °
240°
PHAZE T = °
120°
Auto output switch
ON
Manual output switch
OFF
Reset records
OFF
TR
EN
РУС
العربية
FR
MULTIMETER L-002, MULTIMETER L-002
AA
192.168.4.1

sine8

https://gearsteady.com/products/multimeter-l-001

info@gearsteady.com

Ver 17042024