

EM-07 USER MANUAL



- * RS485 Modbus RTU (1200 - 38400bps)
- * 75 x 65 Custom Design Glass LCD
- * 3-phase voltage and 3-phase current transformer.
- * It shows per-phase apparent powers.
- * It shows voltage (V), current(C), frequency (F) and apparent powers(S), minimum (min), maximum (max) and mean values of phase-to-neutral and phase-to-phase.
- * It shows current values (I1, I2, I3) of each phase.
- * Relay outlet (adjustable)
- * It shows current (C) and apparent power(S) demand values of phase-to-neutral and phase-to-phase.
- * You can delete the demands
- * Menu is password-protected.
- * It has protects voltage, Currents and Frequency
- * It has control and protect of demerage current

1 - Connection Diagrams:

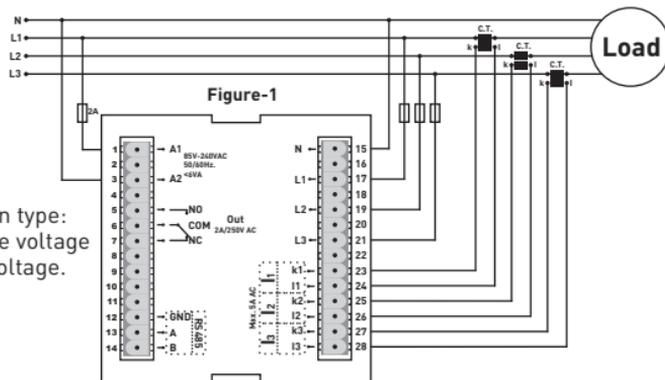


Figure-1: 3P3W connection type:
3 phase current and 3 phase voltage
and without neutral. Low voltage.

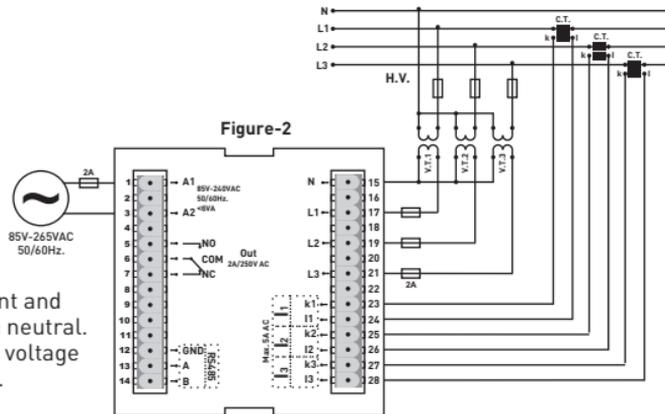


Figure-2: 3 phase current and
3 phase voltage and with neutral.
It is suitable for medium voltage
with voltage transformer.

2 - Points to Take into Consideration in the Selection and Connection of Current Transformer: _____

- Be sure that the current transformer value is higher than the maximum current drawn from the system.
- It is recommended to use a current transformer in class (can be specified as class, cl, kl) 0,5.
- In order to prevent any mistake while connecting the output terminals of the current transformer, use cables in different colors for each phase or designate a number for each cable.
- Keep the cables connected to the output terminals of the current transformer away from the high-voltage line.
- In order to prevent any shake on the current transformer, fix it on the bus-bar, cable or rail.

3 - Warnings: _____

- Use the device according to the instructions specified by us.
- Do not expose the LCD display directly to sunlight in order to avoid any harm on it.
- Note that the temperature level on the panel to which the device is mounted is at the range of operating temperature of the device (-20°C.....55°C)
- There must be a space of 5cm behind the device after its installation.
- Fix the device securely to the front-cover of the panel with the apparatus delivered together with the device.
- Be sure that the panel to which the device is mounted does not operate in a humid environment.
- Place a switch or circuit breaker on the system during installation of the device.
- Place the switch or circuit breaker close to the device or in a location which is easily accessible for the operator.
- Please note that the cables must not be energized during installation.
- Flexible monitored and twisted cables must be used for the input and output lines which are not connected to the mains.
- Installation of the device and electrical connections must be performed by the technical personnel according with the instructions specified in the user's manual.
- The feeder cables must be compatible with the requirements of IEC 60227 or IEC 60245

4 - Maintenance of the Device: _____

De-energize and disconnect the device. Clean the body of the device with a dry or damp-dry cloth. Do not use conductive or other chemical substances as a cleaning agent that can damage the device. After cleaning the device, make its connections and check whether it is working by energizing it.

5 - General: _____

EM-07 Multimeter measures the load on the system and voltage, current, apparent power minimum and maximum values, demands related to this load on the system.

6 - Start-up of the Device: _____

Read the warnings before the device is energized. Make sure that the device is connected according to the connection diagram. When the device energized for the first time, the figure-3 is displayed. Enter the current transformer ratio and the voltage transformer ratios, if installed, on the settings menu at first.

7 - Display Information:



Figure-3

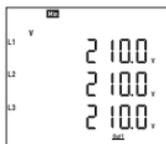


Figure-4

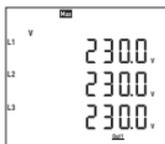


Figure-5



Figure-6

Figure-3: It shows the phase-neutral voltage values. The figure-4 is displayed when you press the Down button.

Figure-4: It shows the phase-neutral minimum voltage values. The figure-5 is displayed when you press the Down button.

Figure-5: It shows the phase-neutral maximum voltage values.. The figure-6 is displayed when you press the Down button.

Figure-6: It shows the phase-neutral mean voltage values.. The figure-7 is displayed when you press the Down button.

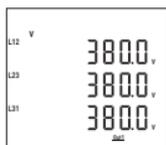


Figure-7

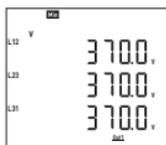


Figure-8

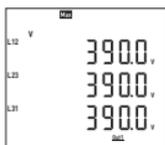


Figure-9

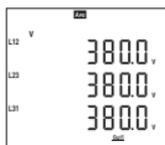


Figure-10

Figure-7: It shows the phase- phase voltage values. The figure-8 is displayed when you press the Down button.

Figure-8: It shows the phase- phase minimum voltage values. The figure-9 is displayed when you press the Down button.

Figure-9: It shows the phase- phase maximum voltage values.. The figure-10 is displayed when you press the Down button.

Figure-10: It shows the phase- phase mean voltage values.. The figure-11 is displayed when you press the Down button.



Figure-11

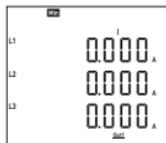


Figure-12

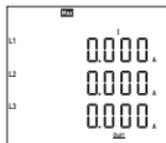


Figure-13



Figure-14

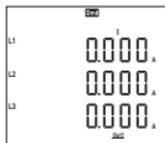


Figure-15

Figure-11: It shows the current values of each phase. The figure-12 is displayed when you press the Down button.

Figure-12: It shows the minimum current values of each phase. The figure-13 is displayed when you press the Down button.

Figure-13: It shows the maximum current values of each phase. The figure-14 is displayed when you press the Down button.

Figure-14: It shows the average current values of each phase. The figure-15 is displayed when you press the Down button.

Figure-15: It shows the current demand current values of each phase. The figure-16 is displayed when you press the Down button.

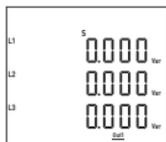


Figure-16

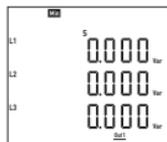


Figure-17

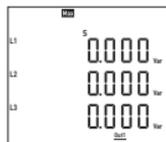


Figure-18

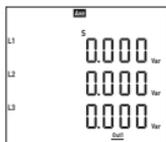


Figure-19

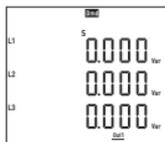


Figure-20

Figure-16: It shows the apparent power values of each phase. The figure-17 is displayed when you press the Down button.

Figure-17: It shows the minimum apparent power values of each phase. The figure-18 is displayed when you press the Down button.

Figure-18: It shows the maximum apparent power values of each phase. The figure-19 is displayed when you press the Down button.

Figure-19: It shows the average apparent power values of each phase. The figure-20 is displayed when you press the Down button.

Figure-20: It shows the power demand values of each phase. The figure-21 is displayed when you press the Down button.



Figure-21

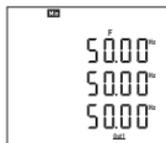


Figure-22

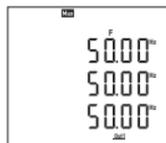


Figure-23



Figure-24

Figure-21: It shows the frequency values of each phase. The figure-22 is displayed when you press the Down button.

Figure-22: It shows the minimum frequency values of each phase. The figure-23 is displayed when you press the Down button.

Figure-23: It shows the maximum frequency values of each phase. The figure-24 is displayed when you press the Down button.

Figure-24: It shows the average frequency values of each phase. The figure-3 is displayed when you press the Down button.

8 - Settings:



Figure-25



Figure-26



Figure-27



Figure-28

Figure-25: Press Menu button to enter password section. The figure-26 is displayed when you enter password and press the Menu button.

Figure-26: It uses for voltage settings. The figure-27 is displayed when you press the UP button.

Figure-27: It uses for current settings. The figure-28 is displayed when you press the UP button.

Figure-28: It uses for frequency settings. The figure-29 is displayed when you press the UP button.



Figure-29

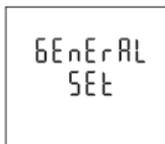
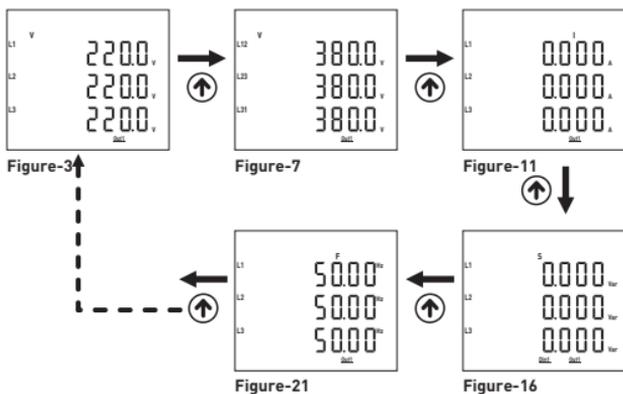


Figure-30

Figure-29: It uses for RS-485 settings. The figure-30 is displayed when you press the UP button.

Figure-30: It uses for general settings. The figure-31 is displayed when you press the UP button.

9 - To advance in Display Inventory: _____



The figure-3 is displayed, when the device is energized. When you press the up button to see the other data on the display, the next data is displayed. The figure-3 is displayed when you press the up button after the figure-21 is displayed. Press the down button to see the bottom display information. You can advance on the display by pressing the Down button and see the bottom display information.

When you press the ESC button or checking the bottom display information, the figure-3 is always displayed.

10 - Voltage Settings:



Figure-25



Figure-26

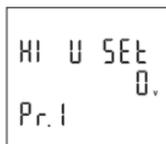


Figure-31

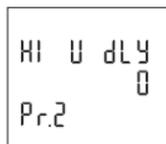


Figure-32

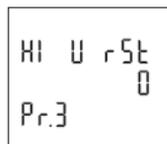


Figure-33

Press Menu button and enter password (Default Password =0000) to enter program list. The figure-25 is displayed when you enter password and press the Menu button. You enter Voltage set when you press Menu button. If you enter voltage set menu, the figure-30 displayed. This menu have 19 different voltage set value. When you press the up button to see the other voltage set values on the display, the next data is displayed. The figure-30 is displayed when you press the up button after the Pr.19 is displayed. By using up-down, buttons select the program. Press Menu to enter required program. By up-down buttons, you can set the program. Press Menu to record your settings, if you press ESC button, you cannot record your settings.

Pr.1: High voltage Set: High voltage protect value

Pr.2: High voltage Delay time: Delay on time. Delay time for activating the output. If any voltage exceeds high voltage set value, Relay output switches off at the end of the delay time.

Pr.3: High voltage Reset time: Delay time for releasing the output. If any voltage below the high set value as a hysteresis voltage, relay output switches on at the end of the delay off time.

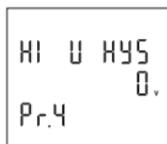


Figure-34



Figure-35

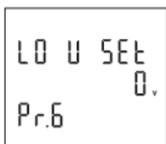


Figure-36

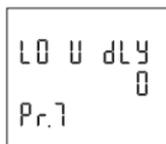


Figure-37

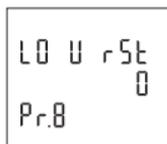


Figure-38

Pr.4: High voltage hysteresis: Required hysteresis voltage for high voltage warning is programmed.

Pr.5: High voltage Protection Enable/Disable: Turns on and off the high voltage protection.

Pr.6: Low voltage Set: Low voltage protect value

Pr.7: Low voltage Delay time: Delay on time. Delay time for activating the output. If any voltage values are over the low voltage set value, Relay output switches off at the end of the delay time.

Pr.8: Low voltage Reset time: Delay off time. Delay time for releasing the output. If all voltage are over the low set value as a hysteresis voltage, relay output switches on at the end of the delay off time.

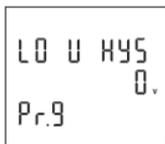


Figure-39

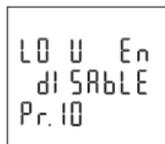


Figure-40

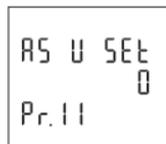


Figure-41

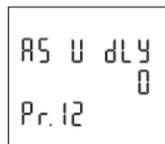


Figure-42

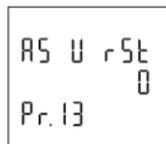


Figure-43

Pr.9: Low voltage hysteresis: Required hysteresis voltage for low current warning is programmed.

Pr.10: Low voltage Protection Enable/Disable: At position disable, low voltage control function is cancelled.

Pr.11: Asymmetry voltage Set: Set value for controlled voltage asymmetry.

Asymmetry Ratio Adjustment: Device calculates a value by dividing difference between highest and lowest phase value to highest phase value. Set value for controlled voltage asymmetry.

Ex: R=235 V , S=227 V , T=195 V ----> R-T=40V Asymmetry ratio = 40/235=17-18 %

Pr.12: Asymmetry voltage Delay time: Delay off time. Delay time for releasing the output.

Pr.13: Asymmetry voltage Reset time: Delay off time. Delay time for releasing the output.

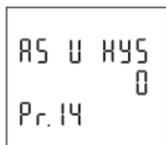


Figure-44

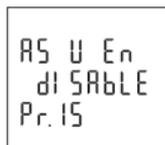


Figure-45



Figure-46

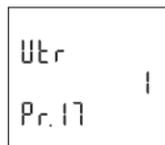


Figure-47



Figure-48

Pr.14: Asymmetry voltage hysteresis: In this menu, required hysteresis percent of value for Asymmetry voltage warning is programmed.

Pr.15: Asymmetry voltage Protection Enable/Disable: At position disable, Asymmetry voltage control function is cancelled.

Pr.16: Auto Reset Enable/Disable: If auto reset enable and system into error , if all voltage are over/below the set value as hysteresis value , relay output switches on at the end of the Reset time. If Auto reset is disable, after all voltage are over/below hysteresis value, relay output switches manually. (Using ESC button).

Pr.17: Voltage Transformer Ratio: voltage transformer ratio is set.

Note: If the voltage transformer is not used between the system and device , voltage transformer ratio is entered as "1".

Example: If a voltage transformer which has a ratio of 34.5KV/100V is used between the system and device; Voltage transformer ratio is entered as 345. (34500/100)

Pr.18: Voltage Fuses Protection Enable/Disable: If any phase voltage exceeds 1.5 times of high voltage set values, or , if any phase voltage decrease 0.5 times of low voltage set value, the relay switches off instantly. At position disable , voltage fuses function is cancelled.

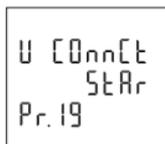


Figure-49

Pr.19: Protection Mode: Connection can be selected as Star or Delta in this menu. Phase-Neutral voltage monitoring can be implemented if the "Star" connection is selected. Phase-Phase voltage monitoring can be implemented if the "Delta" connection is selected.

11 - Current Settings:



Figure-25



Figure-27

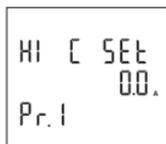


Figure-50

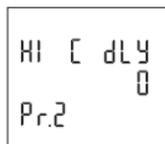


Figure-51

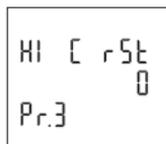


Figure-52

Press Set button and enter password (Default Password =0000) to enter program list. The figure-25 is displayed when you enter password and press the Menu button. You enter Current set when you press Set button. If you enter current set menu, the figure-50 displayed. This menu have 22 different current set value. When you press the up button to see the other set values on the display, the next data is displayed. The figure-50 is displayed when you press the up button after the Pr.22 is displayed. By using up-down, buttons select the program. Press Menu to enter required program. By up-down buttons, you can set the program. Press Set to record your settings, if you press ESC button, you cannot record your settings.

Pr.1: High Current Set: High current protect value

Pr.2: High Current Delay time: Delay on time. Delay time for activating the output. If any current exceeds high current set value, Relay output switches off at the end of the delay time.

Pr.3: High Current Reset time: Delay off time: Delay time for releasing the output. If any current below the high set value as a hysteresis current, relay output switches on at the end of the delay off time.

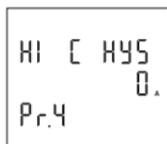


Figure-53



Figure-54

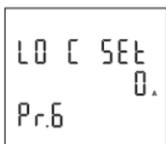


Figure-55

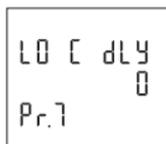


Figure-56

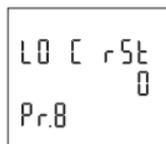


Figure-57

Pr.4: High Current hysteresis: Required hysteresis current for high current warning is programmed.

Pr.5: High Current Protection Enable/Disable: At position disable, high current control function is cancelled.

Pr.6: Low Current Set : Low current protect value.

Pr.7: Low Current Delay time: Delay on time . Delay time for activating the output. If any current values are over the low current set value, Relay output switches off at the end of the delay time.

Pr.8: Low Current Reset time : Delay off time . Delay time for releasing the output. If all currents are over the low set value as a hysteresis current, relay output switches on at the end of the delay off time.

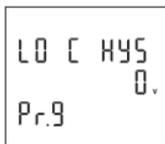


Figure-58

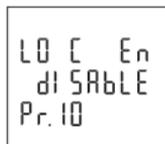


Figure-59

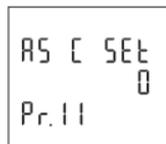


Figure-60

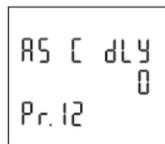


Figure-61

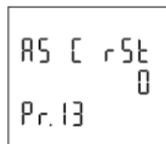


Figure-62

Pr.9: Low Current hysteresis: Required hysteresis current for low current warning is programmed.

Pr.10: Low Current Protection Enable/Disable: At position disable, low current control function is cancelled.

Pr.11: Asymmetry Current Set :Set value for controlled current asymmetry.

Asymmetry Ratio Adjustment: Device calculates a value by dividing difference between highest and lowest phase value to highest phase value. Set value for controlled current asymmetry.

Ex: R=235A , S=227 A , T=195 A -----> R-T=40A Asymmetry ratio = 40/235=17-18 %

Pr.12: Asymmetry Current Delay time: Delay off time. Delay time for releasing the output.

Pr.13: Asymmetry Current Reset time: Delay off time. Delay time for releasing the output.

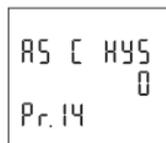


Figure-63

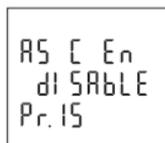


Figure-64



Figure-65

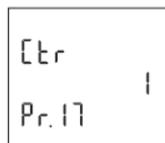


Figure-66



Figure-67

Pr.14: Asymmetry Current hysteresis: In this menu, required hysteresis percent of value for Asymmetry current warning is programmed.

Pr.15: Asymmetry Current Protection Enable/Disable: At position disable, Asymmetry current control function is cancelled.

Pr.16: Auto Reset Enable/Disable :If auto reset enable and system into error , if all currents are over/below the set value as hysteresis value ,relay output switches on at the end of the Reset time. If Auto reset is disable, after all current are over/below hysteresis value, relay output switches manually. (Using ESC button).

Pr.17: Current Transformer Ratio: If a current transformer which has a ratio of 300/5A is used between the system and device; Current transformer ratio is entered as = 300/5 = 60. If the current transformer is not used between the system and device, current transformer ratio is entered as "1"

Pr.18: Current Fuses Protection Enable/Disable:If any phase current exceeds 1.5 times of high current set values, or , if any phase current decrease 0.5 times of low current set value, the relay switches off instantly. At position disable , current fuses function is cancelled.

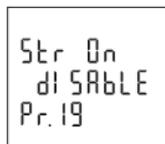


Figure-68

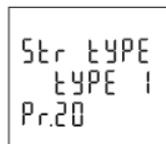


Figure-69

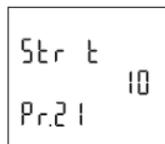


Figure-70

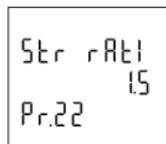


Figure-71

Pr.19: Demurrage Protection Enable/Disable : For enable or disable Demurrage Protection.

Pr.20: Demurrage Protection Mode : There are 2 demurrage mode. Mode-1 is, Demurrage protection is only one controlled when the device is energized. Mode-2 is, if the system current decreases 50mA then demurrage control is resettled, time of any current exceeds 50mA, demurrage controlled is started.

Pr.21: Demurrage Protection Time: Demurrage time is used to prevent from faulty switching caused by motor Demurrage current. In this time period demurrage is controlled by device.

Pr.22: Demurrage Protection Factor: Demurrage current is 3-5 times more than normal operation current consumption.

Ex: High current set value is :5 A, demurrage protection factor is :1.5.

Max Demurrage current is $5 \times 1.5 = 7.5$ A so device will let motor use 35A for start up.

12 - Frequency Settings:

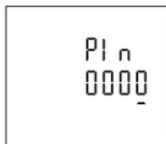


Figure-25



Figure-28

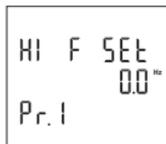


Figure-72

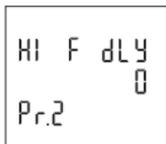


Figure-73

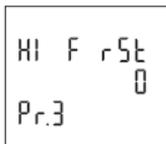


Figure-74

Press Menu button and enter password (Default Password =0000) to enter program list. The figure-25 is displayed when you enter password and press the Menu button. You enter frequency set when you press Menu button. If you enter frequency set menu, the figure-72 displayed. This menu have 11 different frequency set value. When you press the up button to see the other set values on the display, the next data is displayed. The figure-72 is displayed when you press the up button after the Pr.11 is displayed. By using up-down, buttons select the program. Press Menu to enter required program. By up-down buttons, you can set the program. Press Menu to record your settings, if you press ESC button, you cannot record your settings.

Pr.1: High Frequency Set : High frequency protect value.

Pr.2: High Frequency Delay time: Delay on time . Delay time for activating the output . If any frequency exceeds high frequency set value, Relay output switches off at the end of the delay time.

Pr.3: High Frequency Reset time: Delay time for releasing the output . If any frequency below the high frequency value as a hysteresis frequency, relay output switches on at the end of the delay off time.



Figure-75

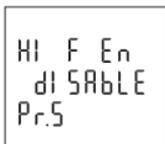


Figure-76

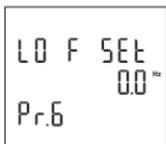


Figure-77

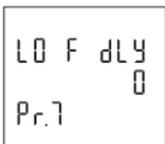


Figure-78

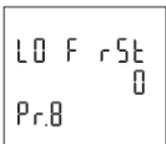


Figure-79

Pr.4: High Frequency hysteresis: required hysteresis current for high frequency warning is programmed.

Pr.5: High Frequency Protection Enable/Disable: At position disable, high frequency control function is cancelled.

Pr.6: Low Frequency Set: Low frequency protect value.

Pr.7: Low Frequency Delay time: Delay on time. Delay time for activating the output. If any frequencies values are over the low frequency set value, Relay output switches off at the end of the delay time.

Pr.8: Low Frequency Reset time: Delay off time. Delay time for releasing the output. If all frequencies are over the low set value as a hysteresis frequency, relay output switches on at the end of the delay off time.

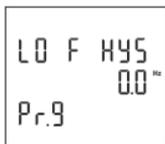


Figure-80

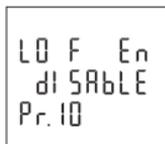


Figure-81



Figure-82

Pr.9: Low Frequency hysteresis: Required hysteresis frequency for low frequency warning is programmed.

Pr.10: Low Frequency Protection Enable/Disable: At position disable, low frequency control function is cancelled.

Pr.11: Auto Reset Enable/Disable: If auto reset enable and system into error, if all frequencies are over/below the set value as hysteresis value, relay output switches on at the end of the Reset time. If Auto reset is disable, after all frequencies are over/below hysteresis value, relay output switches manually. (Using ESC button).

13 - RS485 Settings:



Figure-25



Figure-29

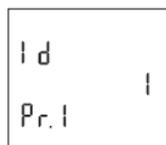


Figure-83

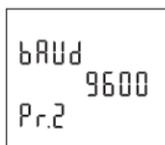


Figure-84

Press Menu button and enter password (Default Password =0000) to enter program list. The figure-25 is displayed when you enter password and press the Menu button. You enter RS-485 set when you press Set button. If you enter RS-485 set menu, the figure-83 displayed. This menu have 2 different RS-485 set value. When you press the up button to see the other set values on the display, the next data is displayed. The figure-83 is displayed when you press the up button after the Pr.2 is displayed. By using up-down, buttons select the program. Press Menu to enter required program. By up-down buttons, you can set the program. Press Menu to record your settings, if you press ESC button, you cannot record your settings.

EM-07 have MODBUS RTU communication protocol, which is optical isolated. All measured parameters can be transfer to the computer. All of them set values can be set with using computer.

Pr.1: Mod Bus ID : you can set Modbus device ID.

Pr.2: Baud Rate : you can set Modbus communication speed.

14 - General Settings:

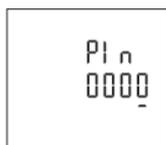


Figure-25



Figure-30

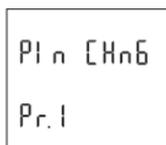


Figure-85

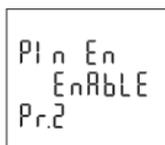


Figure-86

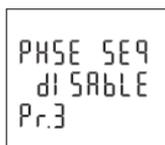


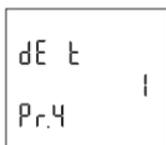
Figure-87

Press Set button and enter password (Default Password =0000) to enter program list. The figure-25 is displayed when you enter password and press the Menu button. You enter General set when you press Set button. If you enter General set menu, the figure-83 displayed. This menu have 6 different General set value. When you press the up button to see the other set values on the display, the next data is displayed. The figure-85 is displayed when you press the up button after the Pr.6 is displayed. By using up-down, buttons select the program. Press Menu to enter required program. By up-down buttons, you can set the program. Press Menu to record your settings, if you press ESC button, you cannot record your settings.

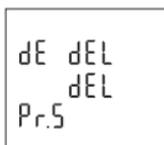
Pr.1: Password Chance: This menu is used for changing the user password. Note: Factory default value for user password is "0000".

Pr.2: Password Protection Enable/Disable: This menu is used for activating the user password. After the user password is activated for entering to the menus; if the Menu button is pressed, while the instant values are observed, user password is required.

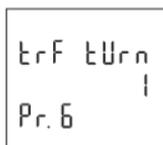
Pr.3: Phase Sequence Protection Enable/Disable: You can use device with phase sequence or without phase sequence function. If you set device for phase sequence, when running, it will be check phase sequence and it will display sequence error on screen.



Şekil-88



Şekil-89



Şekil-90

Pr.4: Demand Time: You can set demand save time.

Pr.5: Demand Delete: You can delete demand records.

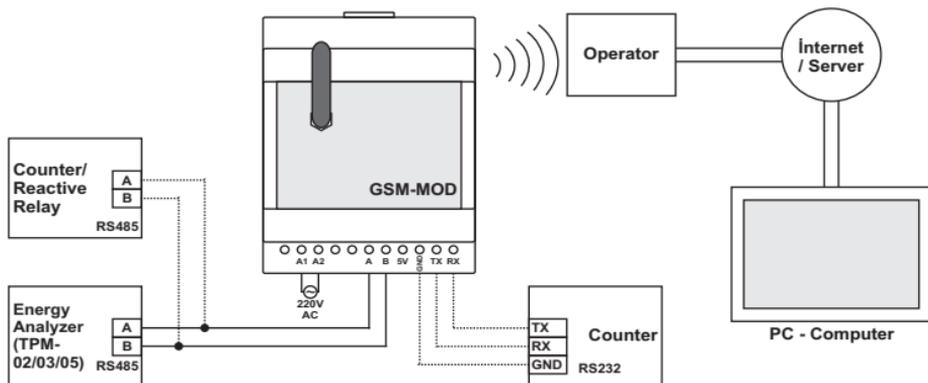
Pr.6: Transformer Turn Number: User defines the turn number, which is the number of how much tour the current cable has rounded into the current transformer. Numbers can be selected between 1-20. Greater the number of turn means greater the sensitivity

15 - Error Codes:

If device in any case of error cut off, Relay will be off, display will be flashing and bottom right-hand corner of display will display ERR Code

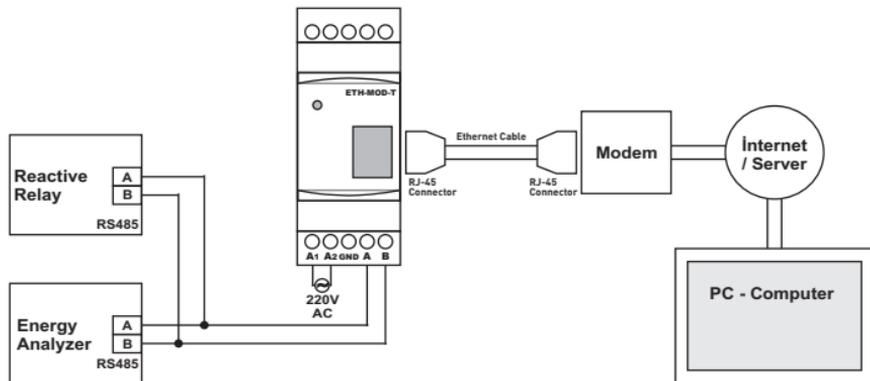
Err0	Phase Sequence ERR
Err1	High Voltage ERR
Err2	Low Voltage ERR
Err3	High Current ERR
Err4	Low Current ERR
Err5	High Frequency ERR
Err6	Low Frequency ERR
Err7	Demurrage ERR
Err8	Voltage Fuses ERR
Err9	Current Fuses ERR
ErrA	Asymmetry Voltage ERR
ErrB	Asymmetry Current ERR

16 - Remote Communication with GSM-MOD:



Only the energy analyzer or the counter and reactive relay together with it can be connected for remote communication with GSM-MOD. Remote communication is provided through energy analyzer (counter and reactive relay) on www.tenseenerji.com (server) by using 100MB (recommended) data line from GSM operators.

17 - Remote Communication with ETH-MOD-T:

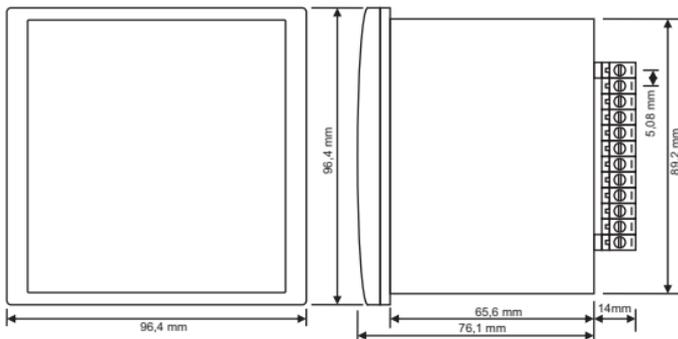


Only the energy analyzer or the counter and reactive relay together with it can be connected for remote communication with ETH-MODE. Remote communication is provided through energy analyzer (counter and reactive relay) on www.tenseenerji.com (server) by using a modem connected to internet.

18 - Table of Protection Values:

Set	Minimum Value	Maximum Value
High voltage Set	1 (Volt)	300 (Volt)
High Voltage Delay Time	1 (Second)	10000 (Second)
High Voltage Reset Time	1	10000
High Voltage Hysteresis	1 (Volt)	200 (Volt)
Low Voltage Set	1 (Volt)	300 (Volt)
Low Voltage Delay Time	1 (Second)	10000 (Second)
Low Voltage Reset Time	1	10000
Low Voltage Hysteresis	1 (Volt)	200 (Volt)
Asymmetry Voltage Set	5 (Volt)	30 (Volt)
Asymmetry Voltage Delay Time	1 (Second)	10000 (Second)
Asymmetry Voltage Reset Time	1	10000
Asymmetry Voltage Hysteresis	1 (Volt)	10 (Volt)
Voltage Transformer Ratio	1	4000
High Current Set	0.1 (Amper)	5.0 (Amper)
High Current Delay Time	1 (Second)	10000 (Second)
High Current Reset Time	1	10000
High Current Hysteresis	0.1 (Amper)	2.5 (Amper)
Low Current Set	0.1 (Amper)	5.0 (Amper)
Low Current Delay Time	1 (Second)	10000 (Second)
Low Current Reset Time	1	10000
Low Current Hysteresis	0.1 (Amper)	2.5 (Amper)
Asymmetry Current Set	5 (Amper)	50 (Amper)
Asymmetry Current Delay Time	1 (Second)	10000 (Second)
Asymmetry Current Reset Time	1	10000
Asymmetry Current Hysteresis	1 (Amper)	20 (Amper)
Current Transformer Ratio	1	2000
Demurrage Protection Time	1 (Second)	100 (Second)
Demurrage Protection Factor	1.0	10.0
High Frequency Set	45.0 (Hertz)	70.0 (Hertz)
High Frequency Delay Time	1 (Second)	10000 (Second)
High Frequency Reset Time	1	10000
High Frequency Hysteresis	0.1 (Hertz)	20.0 (Hertz)
Low Frequency Set	45.0 (Hertz)	70.0 (Hertz)
Low Frequency Delay Time	1 (Second)	10000 (Second)
Low Frequency Reset Time	1	10000
Low Frequency Hysteresis	0.1 (Hertz)	20.0 (Hertz)
ModBus ID	1	247
ModBus BaudRate	1200	38400
Demands Time	1 (Minute)	120 (Minute)
Turn Number of Current Transformer	1 (Circuit)	20 (Circuit)

19 - Dimensions:



20 - Technical Specifications:

Operating Voltage	85V - 240V AC
Operating Frequency	50 / 60 Hz
Operating Power	≤6VA
Operating Temp.	-20°C.....55°C
Voltage Input	5V -300V AC
Voltage Measurement Range	5V - 600kV
Current Input	50mA - 5,5A
Current Measurement Range	50mA - 50.000A
Voltage, Current Accuracy	%±1
Connection Type Supported	3P4W
Current Transformer Ratio	1.0....2000.0
Voltage Transformer Ratio	1....4000
Communication	RS485 MODBUS RTU
Display	75x65mm Glass LCD
Contact Output	2A / 250V AC (Resistive Load)
Weight	≤300Gr.
Protection Class	IP40(Front Panel), IP00(Body)
Panel Hole Dimensions	91mm x 91mm
Connection Type	Plug in Connection
Cable Diameter	1.5mm ²
Installation	Front-mounted to the panel
Operating Altitude	≤2000meter

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