

MT-1 Tracer Meter

RENOGY MT-1 Tracer Meter for Duo Battery
Charge Controller



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Important Safety Instructions

Please save these instructions.

This manual contains important safety, installation, and operating instructions for the charge controller. The following symbols are used throughout the manual to indicate potentially dangerous conditions or important safety information.

⚠ WARNING: Indicates a potentially dangerous condition. Use extreme caution when performing this task.

CAUTION: Indicates a critical procedure for safe and proper operation of the controller

NOTE: Indicates a procedure or function that is important to the safe and proper operation of the controller.

General Safety Information

- Read all instructions, cautions, and notes in the manual before starting the installation.
- There are no serviceable parts inside the MT-1. Do not disassemble or attempt to repair the meter electronics
- Do not allow water to enter the MT-1.

General Information

The Renogy MT-1 Tracer meter is the remote digital display used for the 10Amp or 20Amp Duo Battery Charge Controllers. It is a self-diagnostics meter ideal for monitoring and displaying the current solar system status information and any error indications the system might be experiencing. The information is displayed on a backlit LCD display and is easily navigated using the large buttons on the meter. The MT-1 Tracer meter could also be flush mounted on a wall or flat surface using the mounting frame provided. The MT-1 Tracer is supplied with a 10 meter long cable and is connected using the RJ45 port.

Key Features

- Displays both solar voltage and battery voltage
- Displays charging current and load current
- Displays Amp-Hour and Watt-Hour accumulation
- 2 different brightness levels for the LCD display

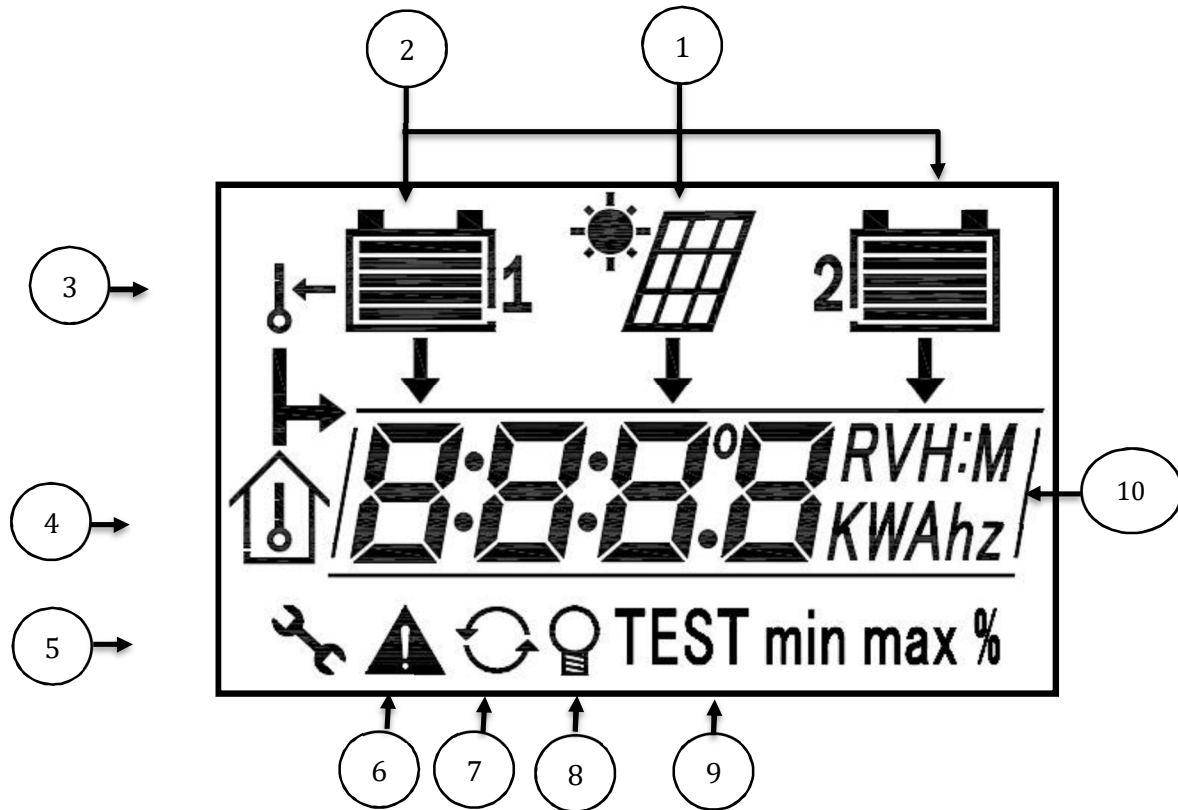
Included Components

- Wall Mounting Frame
- 10 meter cable

Components NOT included

- Screws → Ø 4mm (0.16in)

Identification of Display



1. **Solar Icon**
2. **Battery Icon(s)**—icon is present if the battery is connected otherwise it will remain flashing. It will demonstrate the battery level in which each bar represents 20% of the battery capacity.
3. **Remote Temperature Sensor Icon (optional)**—if the charge controller has the Remote Temperature Sensor connected (separate purchase required), the meter will display this icon.
4. **Local Temperature Sensor Icon**—indicates the current temperature of the room.
5. **Setting Icon**—icon is present when the user is modifying parameters of the controller such as brightness, clock, temperature units, or screen cycling.
6. **Error Indicator**—indicates improper connection, tracer error, or short circuiting of the battery or solar panels.
7. **Data Repeat Icon**—the meter will automatically cycle through the different screens.
8. **Backlight on Icon**—indicates backlight is on.
9. **Self-Test Indicator**—when the tracer is powered on, it will “TEST” through all screens and make sure everything is running appropriately.
10. **Data Units**

Installation

CAUTION: Before installing the MT-1 Tracer, apply power and make sure the meter is working properly. Resolve any issues before installing the meter and the meter cable.

The MT-1 can be mounted in two ways: Frame Mount or in a Wall Mount. A plastic mounting frame has been included for the purpose of Frame Mounting. If Wall Mounting then the MT-1 faceplate sits flush with the mounting surface and the body of the meter would be able to rest comfortably in a hole cut-out on the mounting surface.

NOTE: The screws are NOT included for installation purposes.

Operation

The following keys are used to cycle through the screens or adjust the parameters on the tracer : (K1) **NEXT**, (K2) (**←**), (K3) (**→**), (K4) **SET**

NOTE: Both batteries must be connected to the charge controller, otherwise there will be a default error.

Power On: Test Mode

Once powered on, the meter will have both Charge and Error LED's on as well as display all the icons for approximately 5 seconds. Once completed, it will begin **TEST** mode by which it will cycle through each of the following indicators:

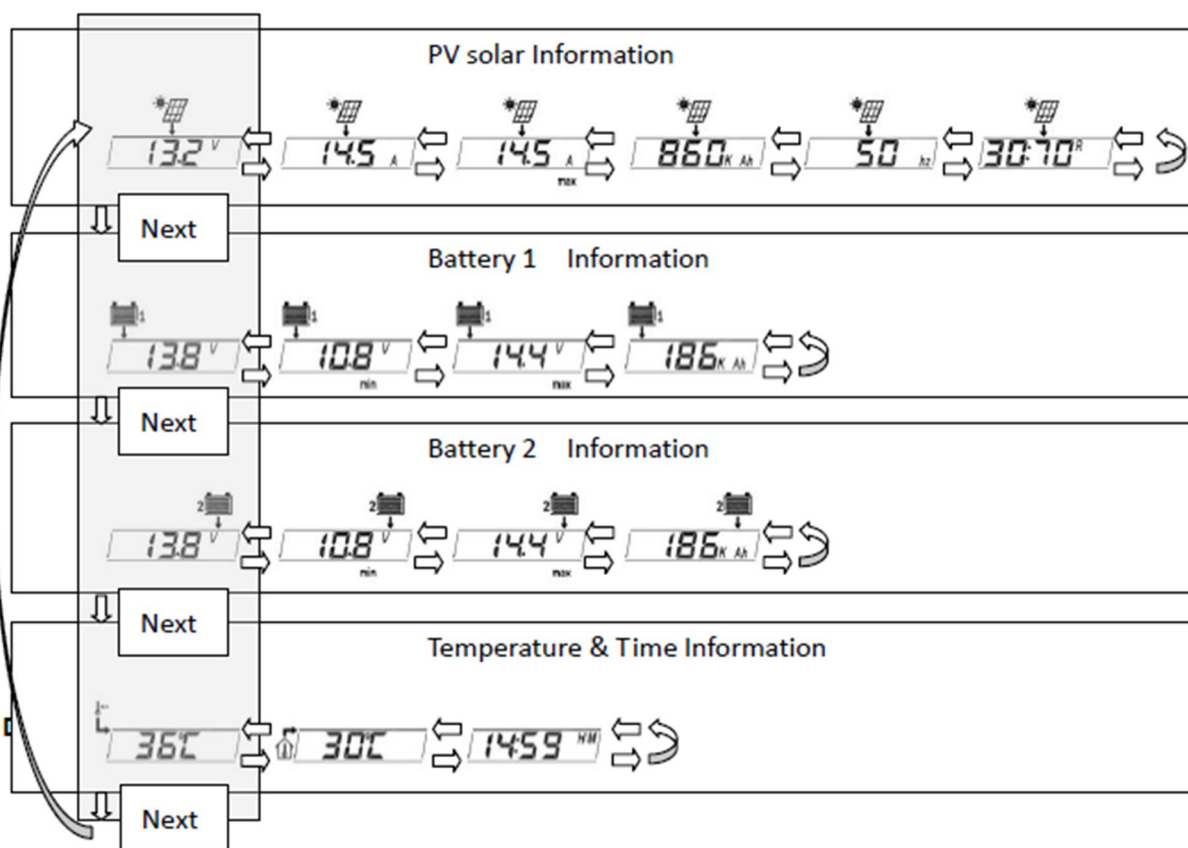
1. Remote Temperature Sensor reading (optional)
2. Battery 1 Voltage
3. Solar Panel Reading
4. Battery 2 Voltage
5. Local Temperature reading
6. Time
7. Units
8. Setting Icon
9. Error Indicator
10. Data Repeat Icon
11. Backlit indicator
12. Min, max, percentage

NOTE: Test mode can be manually activated by pressing **NEXT + (←)**

Menu Display

After **TEST** mode, the user can use the **NEXT** key to cycle through four menus: PV Solar Information, Battery 1 Information, Battery 2 Information, and Temperature/ Time Information.

The user can also use the (K2) (←), (K3) (→) keys to cycle within the four menus and display more information.



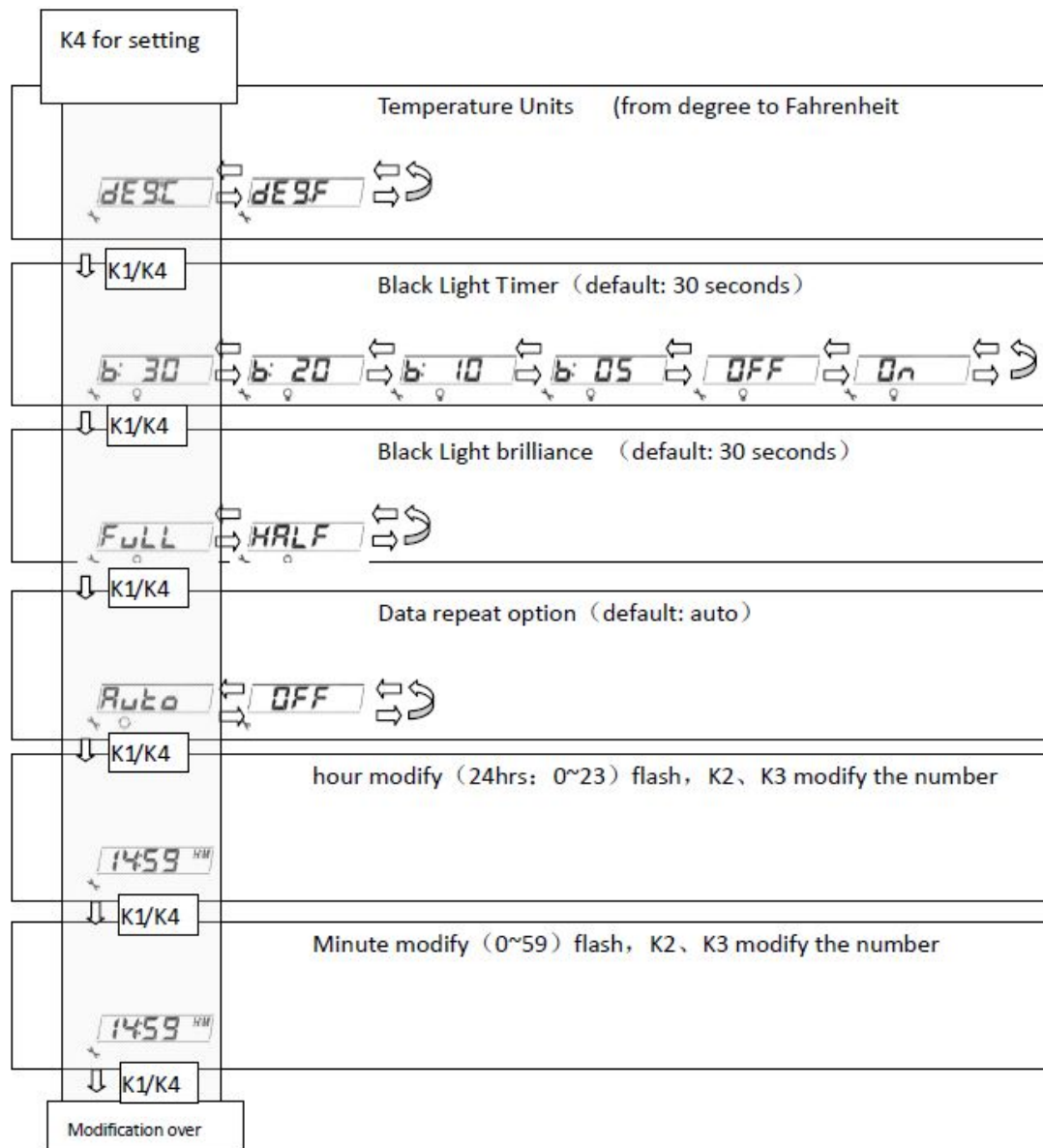
Data Screens		
PV Solar	Battery 1 and Battery 2	Temperature / Time
- Solar Panel Volts (V) - Solar Panel Amps (A) - Max Solar Panel Amps (A_{MAX}) - Generated Amp-Hours (Ah) - PWN Charge Frequency (Hz) - Charge Priority Percentage (R)	- Battery Voltage (V) - Max Battery Voltage (V_{MAX}) - Min Battery Voltage (V_{MIN}) - Battery Amp-Hours (Ah)	- Remote Temperature Reading (optional) - Time - Local Temperature Reading

****The following data represents the 4 menus and the corresponding sub displays.**

User Parameter Setting

By pressing the **SET** button, the user is able to modify some parameters of the meter. They include: Temperature Units, Backlight Timer, Backlight Brightness, Data Repeat Option, and clock. The user uses the (K2) (←) and (K3) (→) to adjust the parameter, and then press (K4) **SET** again to save the setting.

The  icon will be displayed when the user is in the **SET** function. It will disappear once the user is in the reading menu.



Function	Display	Description
Temperature	dEg	Changes Temperature Units (C°) to (F°)
Backlight	B:	Sets a backlight timer after last button push On: Always on B:30 – 30 seconds B:20 – 20 seconds B:10 – 10 seconds B:05 – 5 seconds Off: - Always off
Brightness	Full:	Full: high brightness Half: low brightness

Data Repeat	Auto	Auto: Each Menu and submenu repeats every 3 seconds Off: No data will repeat unless the user presses the arrow keys.
Time	00:00 ^{H: M}	Adjust the hours and minutes of the clock.

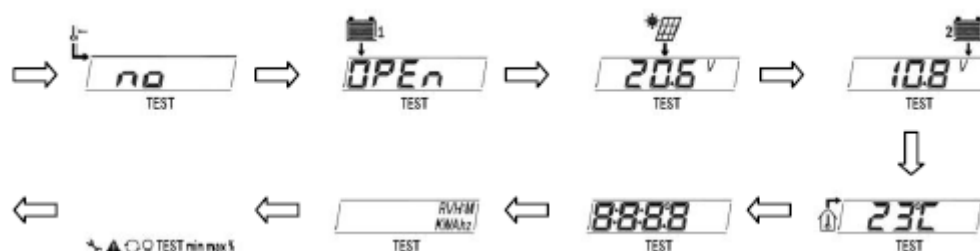
System Status Icons and Considerations

Test Mode

At any time the user can press the **NEXT + (←)** to activate test mode. Test mode checks and displays the related data automatically. The user might experience the following display when undergoing test mode:

“**NO**”—there is no connection. Connect a battery if applicable. In the default reading screen the battery icon will be flashing.

“**OPEN**”—indicates that there is no battery connection, or the battery is over voltage. Check manufacturer specifications and ensure system is appropriate.



Error Indicator

The red LED on the tracer is on or the “▲” symbol is visible in the digital display. Possible reasons for the Error Indicator include:

1. One battery could be disconnected, over voltage, or open circuit. Check connections. Disconnect and reconnect.
2. The remote temperature sensor probe is malfunctioning. Check the sensor probe. Disconnect and reconnect.
3. The system is experiencing overcharging current. Check connections, disconnect and reconnect
4. Solar PV is short circuited. Check connections, disconnect and reconnect.

NOTE: Both batteries must be connected to the charge controller, otherwise there will be a default error.

Telecommunication Port

When the meter running on individual power or the communication is cut off, the MT-1 will display graphical symbols abnormally. Press any key to stop the display and resume normal

activity. IF problem persists, disconnect the port and connect it again. Normal behavior is when the meter updates every 20 seconds.

NOTE: Errors could occur in the telecommunication port if the connection is not properly secured. Also, too long of a cable may cause some inconsistencies.

Battery Level Flashing

Each strip equals to 20% of battery capacity. The bar that is flashing indicates that the battery is within the next increment of 20% of the battery capacity. For example: when the first bar is flashing, the battery is at 1-19% of capacity. Similarly, when the second bar of the battery is flashing, then the capacity is at 21-39%.

NOTE: The meter measures battery capacity by the voltage it is experiencing. When batteries are charging, they will not necessarily match the accurate battery capacity.

Battery capacity AH

AH is the accumulation of charging, each one minute will count. The data is not accurate while the charge current is too small. The min. is 1AH, means 1 amps charging for 1 hour, Ah comes to show.

Troubleshooting

MT-1 has no display

- Verify that the duo battery charge controller is powered on and that it is connected to the MT-1. The MT-1 is powered by the duo battery charge controller.

LCD display is dim

- Make sure that the MT-1 is not in half-brightness mode.
- Check the system battery voltage. The MT-1 needs a minimum of 8 V to operate.
- Verify that the temperature is within range of the LCD operating parameters.

MT-1 turns on, but shows no data

- MT-1 is potentially damaged or the cable is damaged. Replace the cable by contacting the manufacturer.

MT-1 display does not match product manual

- Our products undergo manual revisions from time to time. Please check our website at Renogy-store.com > downloads for latest documentation.

Buttons do not work

- Disconnect the MT-1 and clean the faceplate to remove any potential buildup of residue
- Reconnect MT-1

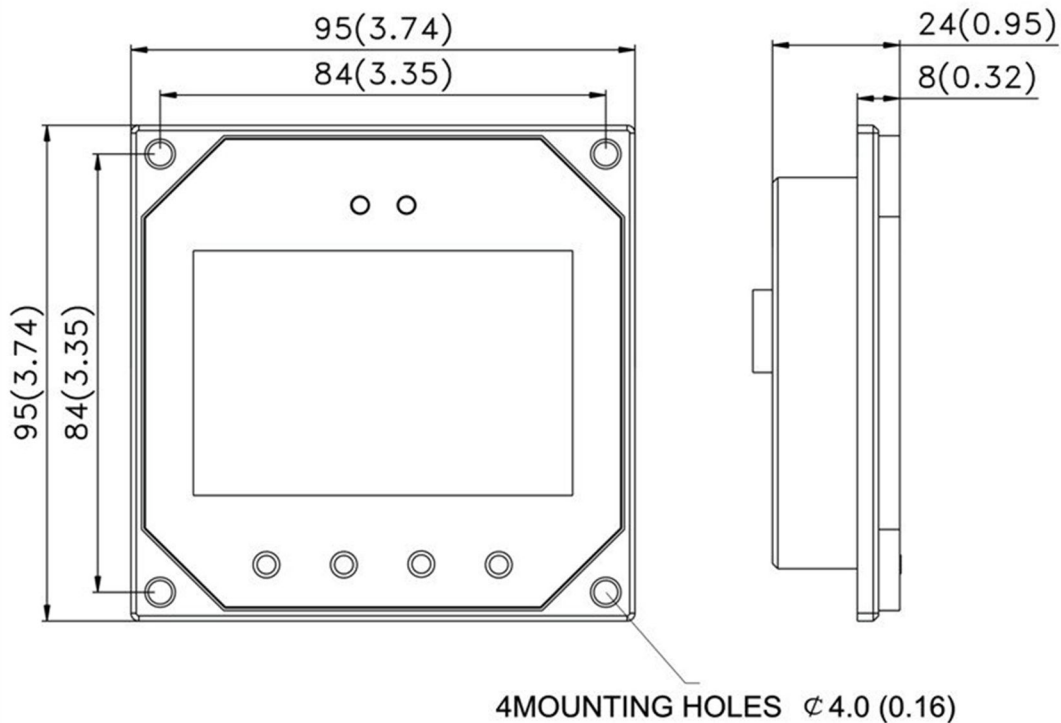
Technical Specifications

Electrical Parameters	
Rated Voltage	12V
Minimum Voltage Suggested	8V
Strong backlight on	< 23mA
Low Backlight on	< 20mA
Backlight and LED indicator off	< 17mA

Mechanical Parameters	
Communication Cable	RJ45 (8 pin)
Cable Length	10 meters
Faceplate Dimensions	95 x 95mm (3.74 x 3.74in)
Wall Frame Dimensions	110 x 110mm (4.33 x 4.33in)

Temperature Parameters	
Operation Temperature	-40°F to 140°F
LCD Operation Temperature	-14°F to 104°F
Humidity	0-100%

CAD Dimensions



NOTE: Dimensions are in millimeters (inches)