Do you have Boat or RV battery problems? Get complete control of your Boat or RV DC energy supply with the Microlog DMM-1 DC/Battery Monitoring System

- > Protect your batteries against deep discharge
- > Very accurate 2 battery banks voltage measurement
- > Separate charge/discharge current measurement
- > Low and high voltage monitoring and alarm on batteries
- > Simple, one MODE button to activate all functions
- > Red or Green backlit display
- > Polycarbonate facing
- > Corrosion treated Surface Mount Technology circuit
- > Sealed adjustment trimmers
- > Stainless steel hardware for marine environment
- > Easy to install and operate
- > Two-year limited warranty

The Microlog DMM-1 DC/Battery Monitoring System is designed to measure the status of batteries in Boats or RV's and efficiently manages the energy flow in the charging and distribution systems. Our system include a precision digital instrument, more accurate than the standard battery monitoring equipment found in most boats and recreational vehicles, which only give approximate values. Precision digital monitoring delivers the necessary data to manage electrical resources more efficiently. In challenging circumstances, such as at sea, this information may be crucial in making important decisions.

Precision Voltage Monitoring:
The Microlog DMM-1 Battery Monitoring System is designed to monitor the level of charge for two batteries or battery banks by measuring the Total Battery Cells Voltage with great precision. The voltage monitoring will tell you the state and condition of your batteries and your charging equipment; furthermore, you will know when it's time to start and stop charging.

Separate Charge and discharge current monitoring:
The Microlog DMM-1 System does not measure AMP-Hours but rather monitor the intensity (ampere or A) of incoming current from charging equipment such as alternators, wind generators or solar panels and, at the same time, measure the separate discharging or outgoing current, consumed by electrical appliances or equipment powered by the battery system. The DMM-1 instrument measures the slight potential difference between shunts terminals (shunts are optional) and translates this measurement in ampere. Charging current is represented with a "+" sign and discharging current with a "–" sign.

Low and high voltage level alarms:
Batteries can sustain permanent damage if drained below 11.5 V too often or for long periods or if they are overcharged. For that purpose, we have included an alarm, which will trigger a warning signal if the voltage falls below 11.8 V or surpasses 15.1 V on both monitored banks.

Optional backlit Display:
Our DMM-1 instrument now has an optional Red or Green backlit display for night monitoring.

As good as it gets:
The Microlog DMM-1 system is carefully made with the finest components and materials in order to optimize its reliability and performance, such as: Polycarbonate Facing, Surface-Mount Technology (SMT), Anti-Corrosion Treatment, Sealed Adjustments Trimmer, and Stainless Steel Hardware for harsh marine environment. The system also uses a very low current draw.

The Microlog DMM-1 instrument has a two year limited warranty and comes with fuses-holders and fuses for short circuit prevention.

Plug and Play:
The system is easy to install and operate; no programming or resets of any kind; simple one-mode button for all functions.

SWK-225 Shunts and Wiring kit:
The SWK-225 Shunts and Wiring kit is required if you want to measure current (if you only want voltage measurement and an alarm, you only need to purchase the DMM-1 instrument).
Kit includes: Dual 200 A Marine Grade Shunts, 25 feet PVC jacketed, tinned, flexible marine grade wire for exact calibration of your DMM-1 instrument and connectors to shunts and battery poles.

DMM-1 Specifications :

Voltage measurement range:	8.0 -17.0 V
Resolution (volts):	0.01 V
Measurement precision:	± 0.03 V (20°C)
Low voltage level alarm trigger:	11.8 V ± 0.1
High voltage level alarm trigger:	15.1 V ± 0.1
Current measurement range:	0 - 200 A
Resolution (amperes):	0.1 A.
Measurement precision:	0.2 A (20°C)
Operating current requirements:	2.0mA (off) - 18.0mA (on)
Operating temperature range:	0 - 40°C
Storage temperature range:	-30° to + 60°C
Size:	4.3 " X 3.3 " X 0.9 " 11.1 cm X 8.2cmX 2.3cm

Shunts Specifications:

Continuous Current limit:	180 A
Surge limits (25 °C):	280 A 15 sec/min MAX 2000 A Surge : 1 sec/min MAX
(Derating as ambient temperature rise)	
Size:	7.1 " x 1.75" x 1.75" 18.0 cm X 4.5cmX 4.5cm

Dual 200 A shunts which are made with brass which meets naval specification.
They can sustain 280 A for 15 seconds.

How the Microlog DMM-1 DC System / Battery Monitor works:

The Microlog DMM-1 DC System / Battery Monitor is designed to monitor the voltage status of up to two batteries or battery banks. It measure the current flow of charging devices and separate equipment current consumption for precise DC system monitoring and management.

An integrated alarm system is included, sending a warning signal, should the voltage of any battery fall under 11.8 volts or exceed 15.1 volts, while charging.

A typical boat 12 Volt system include two batteries: one battery (battery bank or house bank) is usually assigned to feed electrical appliances (fridge, lighting etc..), the second battery is dedicated to start the engine (See typical installation in Figure 1). Some boats can have two house banks and two engine batteries. RV's may include one engine battery, one generator battery and two house banks. The DMM-1, in those situations, should be assigned to monitor the two house banks, as those ones will likely be subject to deep discharge. Each DMM-1 Battery input can measures Voltage levels of one individual battery or one bank of several batteries. Total charging or discharging current to be measured, is passed through the "Shunts".

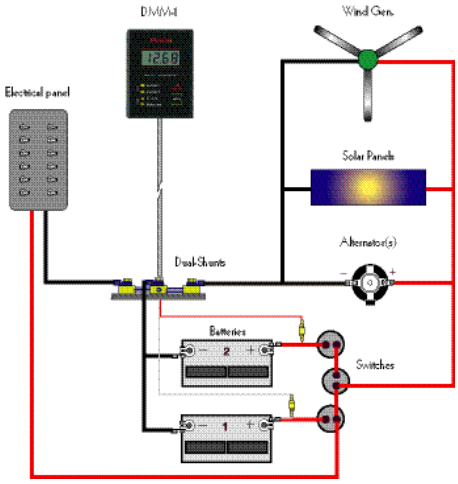


Figure 1:Typical installation

Measuring Voltage:

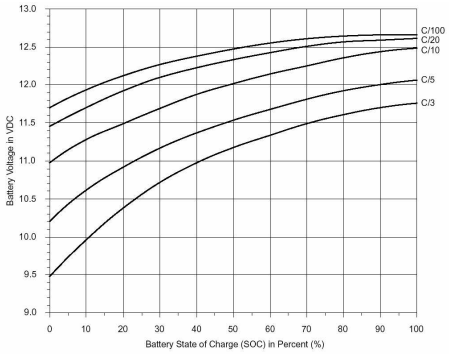
Measuring Specific gravity of the battery electrolyte (acid+water) in each cell of a lead-acid battery with caps will tell the level of charge but it can be messy and is not an easy task.

Voltage indication is also a prime way to learn the status of charge of your batteries. This voltage also corresponds to the level of specific gravity related to any given level of charge. A Lead-Acid Battery voltage level of 11.7 Volts at rest (no load or charging device), indicates a completely discharged battery, while a voltage level of 12.60 Volts (12.95 Volts/Gel-cell), without any charging device connected, indicate a full charged battery (at room temperature). Any battery that discharges often below 11.6 volts (50%, under load) will eventually shortens its service life. Voltage table and curves below will vary with type and capacity of your batteries.

The typical status of charge of your batteries is shown in the following table and chart:

Percent of charge	Battery Voltage at rest (no load or charging device)				
	Lead-acid	Gel-Cell	AGM	Lead-acid Battery Voltage (under load, no charging device)	Specific Gravity
100%	12.60 V	12.95 V	12.80 V	12.60 V	1.255-1.275
75%	12.42 V	12.65 V	12.60 V	12.06 V	1.215-1.235
50%	12.18 V	12.35 V	12.30 V	11.58 V	1.200-1.180
25%	12.00 V	12.00 V	12.00 V	11.04 V	1.165-1.155
0%	11.70 V	11.80V	11.80 V	10.50 V	1.130-1.110

Typical Battery Voltage vs % of charge chart at 77°F (25°C) (according to a major battery manufacturer)



Measuring Current:

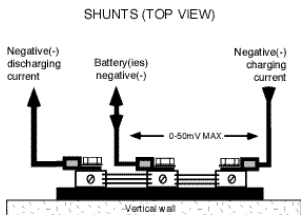


Figure 2: Typical current flow in shunts

The Microlog DMM-1 has 2 separate current measurement circuits, one circuit for charge current and one for discharge current. Our instrument does not measure AMP-HOUR type of readings. It rather measure the actual current produced by the charging equipment and, separately, the current consumed by electrical devices on board. Current measurement is determined by creating a very small voltage drop (0 to .050 Volts maximum) in a dual shunt (included in the accessory kit) connected to the negative side of charging and/or discharging devices. Your DMM-1 instrument is measuring this small voltage drop on the shunts and convert this measurement to display a current reading. Measuring these slight variations in voltage is critical in order to achieve an accurate reading. All measured current MUST pass through the shunts. Current flow is indicated by a + or - sign.

The alternator, or other charging devices, will raise the battery (ies) voltage to 14.4 Volts through the different charging stages. This voltage information combined with the level of current supplied will tell you when you have reached the full charge status.

The Operation Modes:

- There are four monitoring modes: Battery 1, Battery 2, Charge and Discharge.

Use the MODE button to toggle through these choices. An indicator light will appear on the selected mode:

- Battery 1: monitors the voltage of the first battery.
- Battery 2: monitors the voltage of the second battery.
- Charge: monitors the current in AMPERES (AMPS) of the charging circuit.
- Discharge: monitors the load current of appliances and equipment running on the batteries.
- Off: a fifth mode position, the OFF mode, deselects the above modes and alarms are disabled.

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