M-11 Battery Management System

Nadagy Corporation

M-11 Battery Management System is designed to protect a 12V lead-acid battery from undesirable conditions of undervoltage and overcurrent.

Battery systems, which are left unattended for a long period of time, should monitor the battery voltage and prevent it from dropping below a minimum value. Nadagy M-11 cuts-off the loading circuit in such circumstance. The load remains disconnected until the battery charge is replenished. When the voltage recovers above the turn-on threshold, the M-11 automatically reconnects the load.

Nadagy M-11 also monitors the battery current and prevents the overcurrent condition. It is safe to short-circuit or overload the load terminals. In such a case, the battery current still flows, but is limited to a maximum value.

SPECIFICATIONS (MODEL 5x40)

Parameter	Value
Current limit	4.5 A to 5.0 A
Voltage range	0 V to 40 V
Cut-off voltage	10.0 V
Turn-on voltage	10.8 V
Dimensions (in)	$6.5 \times 5.25 \times 10.25$
Weight	4.3 lb

DESCRIPTION

The M-11 Battery Management System is built without a digital clock which results in zero electromagnetic emissions. No internal relays or switches are used to avoid arcing and electromagnetic transients.

The enclosure is electrically connected to the green post indicated by the symbol of ground. It should be used in systems where proper grounding is required. The other terminals are completely isolated from the devise enclosure.

M-11 offers excellent reliability since no fan or any other moving mechanical parts are used in the design. The M-11 device should be used in upright position, standing on its rubber feet, so that the fins of the heat-sinks remain vertical. This will ensure proper air circulation while the device needs to dissipate power. This is especially important should the device be used in a short-circuit condition with full voltage for indefinite amount of time.

APPLICATIONS

Remote Data Centers: Running a solar-powered remote data acquisition system requires a battery for continuous operation. In case of insufficient sunlight, M-11 will protect the battery from draining below an acceptable level.

Capacitor Inrush Protection: Battery-powered systems with large electrolytic capacitors may have a substantial inrush current when switched on. To prolong the life of capacitors and switches, M-11 can be used as a pre-charge device, bringing up the load voltage more slowly and limiting capacitor charging current.

I(V) CHARACTERISTIC
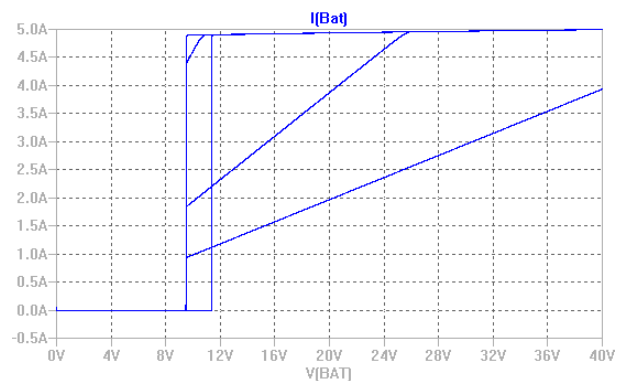
Load characteristics representing battery current versus battery voltage when loaded with $1\,\Omega$, $2\,\Omega$, $5\,\Omega$, and $10\,\Omega$ resistors (top-to-bottom).