

AN ISO 9001-2008 CERTIFIED COMPANY

McUH10 MICROCONTROLLER BASED Solar Charge Controller 12A/12V, Dual Mode

An open frame 16 bit Microcontroller based 12A continuous capacity solar charge controller with dual mode.

Can work in normal mode or in dusk to dawn mode by selector switch.

Electronic overload/short circuit protection with automatic reset after every five seconds. Visual indicator of overload.

Withstands 25% overload for 3 seconds without overload shut down.

Battery voltage indicator 4-level graph to show battery low, normal, healthy and full.

Positive indicator of charging.

Unique High Voltage Protection: If battery voltage is dangerously high > 15V, or no battery is connected, the load is fully protected by disabling the entire circuitry.

Optional temperature compensation for charging the battery.

Factory flashed software options for Li_Ion, LiFePO4 or SMF Lead Acid batteries (default settings).

All standard protections against deep discharge and over charge of battery. Full protections against reverse panel connection and reverse current flow from battery to panel during night.

Salient Specifications: (For Lead Acid Nominal 12V Battery)

SYSTEM:	12V Nominal
CAPACITY:	Panel 200 Wp Max, Load 12Amax
REGULATION:	LOW LOSS, SERIES TYPE
OVD:	Output Voltage Drop < 200 mV at 12A load
IVD:	Input Voltage Drop < 300mV at 12 A charge
LVD:	Low Voltage Disconnect, 11V
HVD:	High Voltage Disconnect, 14.2 V
LVR:	Low Voltage Reconnect, 12.3 V
HVR:	High Voltage Reconnect, 14.15V
(Battery Charging is PWM type by default)	
HVP:	Battery high voltage protection. If battery voltage goes dangerously high or no battery connection. Load is disconnected, charging control disabled

PROTECTIONS: Electronic overload protection at 15A. Auto reset after 5 sec.
Withstands overload upto 25% for 3 sec.

APPLICATION: Solar homelighting, street lighting in medium power range
 AMBIENCE: Operating Temp 0 to 50 Deg C, 80% RH
 DIMENSIONS: Main Controller 100x95 mm
 Display 50x16 mm

Indicators and Controls: (For Lead Acid Nominal 12V Battery)

CHARGING: **Green LED**. Turns on when panel voltage is more than battery voltage to indicate positive charging.

OVERLOAD: **Red LED**. Turns on when load exceeds 15A. If load is more than 12A but less than 15A, it waits for 3 sec to shutdown load. After 5 sec, it again checks the load to start.

BATTERY STATUS: 4 LED graph.

1. **RED is on if bat is less than or just equal to LVD. (BAT LOW)**
2. **RED turns on and off if bat is between LVD and LVR. (BAT RESERVE)**
3. **AMBER turns on and RED turns off when bat is above LVR (BAT NORMAL)**
4. **First GREEN turns on when bat is above healthy level (BAT HEALTHY)**
5. **Second GREEN turns on when bat is fully charged (BAT FULL)**
6. **Alternates Red and Amber when battery > 15V . Load is disconnected. Charging is disabled.**

NORMAL/D2D selector switch: When in NORMAL mode, output provides the battery voltage during day and night. When in D2D mode, output is available only during night.

-6-WAY TERMINALS: On board connector marked PV+, PV-, BT+, BT-, LD+ and LD- to make connections to respective inputs and outputs.

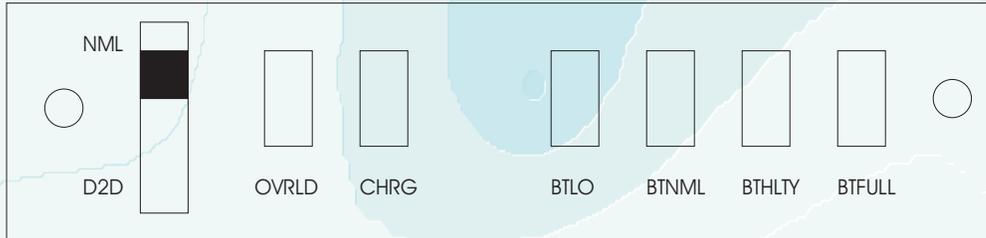
PLEASE NOTE ABOVE INFORMATION RELATES TO LEAD ACID BATTERY (default settings). THE OPERATION AND SPECIFICATIONS WILL BE DIFFERENT IF BATTERY USED IS LITHIUM ION, LITHIUM IRON PHOSPHATE ETC. TO COMPLY WITH CHARGE DISCHARGE CHARACTERISTICS OF RESPECTIVE TYPE.

OPERATING INSTRUCTIONS: McUH10



IMPORTANT: READ THIS INFORMATION BEFORE USE.

McUH10 comes with two PCBs; display pcb is separate which can be connected with relimate cables to the main controller. Relimate cables are 2, 3 and 4 pin types so that possibility of wrong connections is eliminated. 3 relimate connectors are on master board for respective connections of cables from display board.



The display board has above arrangement of switch and indicators .

The switch can be kept either on NML mode (supply is available to the load day and night) or on D2D mode (supply is available only during night).

Red LED, **OVRLD** will be on when load current exceeds the rated capacity. Load is disconnected instantly. This will be reset after 5 sec and controller again checks the load status. If overload condition is gone, supply will be automatically available at load terminals else, it again disconnects the load and cycle repeats till overload condition is removed.

Green LED, **CHRG** will be on when battery is connected and panel voltage is more than bat voltage.

Red LED **BTLO** will be on when bat goes below LVD. If bat voltage is between LVD and LVR, this will be on and off alternately to indicate the reserve status of battery.

BTNML LED, amber/yellow, will be on when battery voltage is above LVR. After this level, BTLO LED will be off all the time.

BTHLY and **BTFULL**, both Green LEDs, will be respectively on when bat voltage reaches healthy and full status (13.5V and 14V respectively). Thus when bat is fully charged, all three LEDs will be on.

OVERVOLTAGE OPERATION:

If bat terminal voltage is more than 14.7V, entire operation is disabled and BTLO and BTNML will blink alternately. No output voltage is available at load nor the charging control is enabled.

NO BAT OPERATION:

If bat is not connected and only panel is connected, entire circuitry is disabled and no indications will be on.

INITIAL DELAYED ON OPERATION:

Whenever battery comes in enabling limit (NML to HVD) from shutdown operation (due to LVD or HVP), controller waits for 10 sec to confirm the status and pass the supply to load.

D2D OPERATION:

When this mode is enabled, supply is available at dusk till dawn only. This is useful if you want to use it for outdoor light control. There is a delay of 10sec to sens the onset of both dusk and dawn.

CAUTION WHILE MAKING CONNECTIONS OR DISCONNECTING:

Follow the following sequence-

1. Make connections to battery terminals first with proper polarities. If battery is connected properly and voltage is more than 10V, display board LED/s will be on showing the status of battery voltage. If battery is connected in reverse direction or battery voltage is less than 5V, no indications will be on. Check battery terminals. Unless, battery indicator is on, do not proceed further.
2. If battery is NML or above, connect the load with proper polarities. If it is less than 10A, load will be on. If there is short at load terminals or it is more than 12A, overload indicator will be on and output voltage will be disconnected.
3. Switch off load and connect the panel. If panel is properly connected and its voltage is more than 12V, charging indicator will be on. If panel is reverse connected or its voltage is less than 12V, charging indicator will be off.
4. While disconnecting the unit, first remove the panel, then load and lastly the battery. Battery is thus First In Last Out.