



Technical Manual of 40 Channel Battery Charging Solution (VRLA Model)



Operating instruction

GP-MXV-40 is a 40 channel Motorcycle VRLA battery charger which is a microcontroller based SMPS technology designed smart charger. It detects charging current required for the battery (depending upon battery condition). It also enables to charge deep discharge batteries.

1. VRLA Motorcycle Battery Charger views :

Front Display & Operating Panel OF Single Channel:

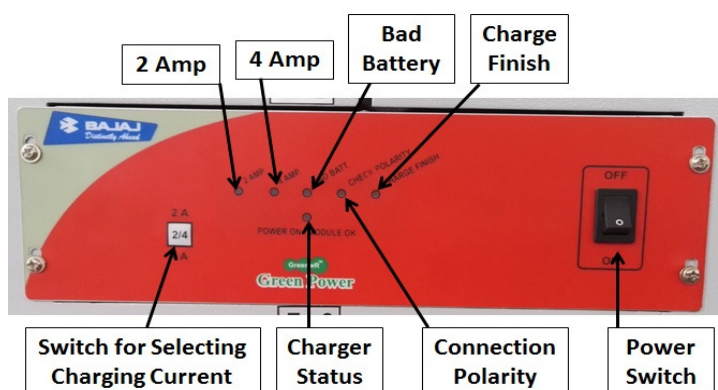


Fig. 1

Front Panel:



Fig. 2

Side Panel indicating connections:

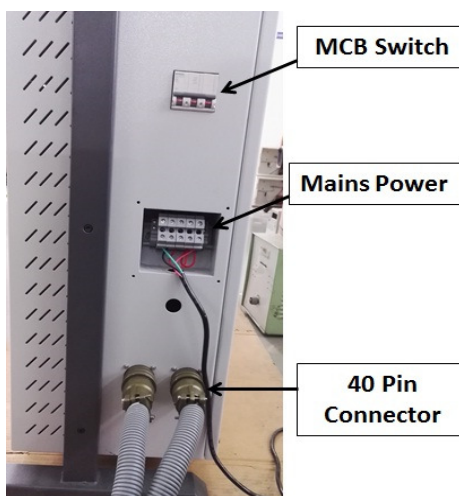


Fig. 3



Back Panel with cooling Fans:

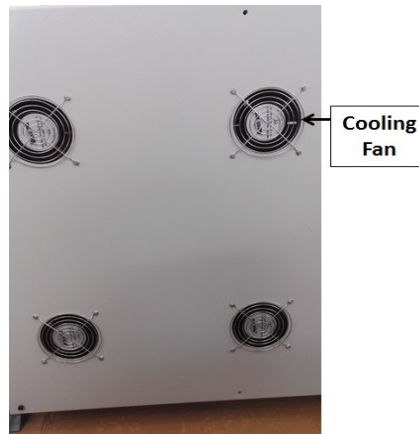


Fig. 4

VRLA Motorcycle Battery Rack views:

Top View with Battery Charging compartment:



Fig. 5

Side Panel indicating connections:

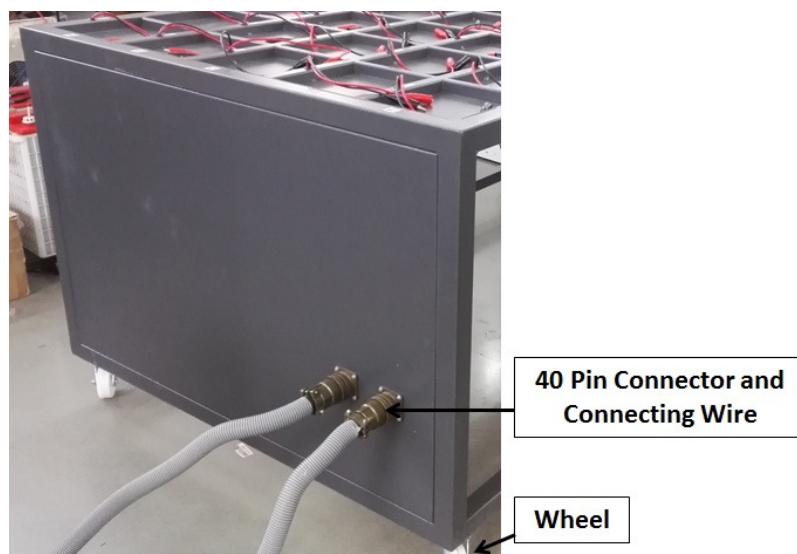


Fig. 6



Bottom view indicating connections:

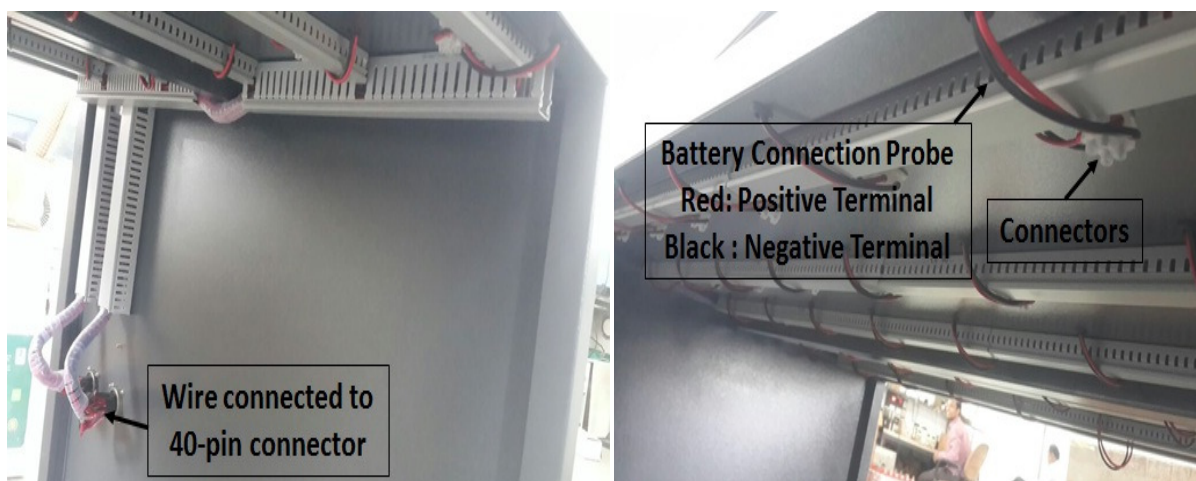


Fig. 7

2. Technical Specification:

Charger Rack

Input Voltage AC:	90 – 270 V _{AC} , 60 Hz, Single Phase
Output Voltage:	12 V _{DC} (Single Channel)
Output Current:	2 A & 4A (Selectable)
Cut-off Voltage:	14 V _{DC}
Protections	<ul style="list-style-type: none">: Input under Voltage: Input over Voltage: Output over Voltage: Output Overload: Output Short Circuit
LED Light	<ul style="list-style-type: none">: Power On/Module OK (Blue colour): Charging Current (Green Colour): Bad Battery (Red Colour)



	: Connection Polarity (Yellow Colour)
	: Charge Finish (Green Colour)
MCB Protection	: 40 Amps, 415 Volts
Cooling Type	: Force Cooling
Storage Temperature	: -20 ⁰ to 80°C Charger Rack
Dimension	: L 137.4 cm X W 32 cm X H 82.5 cm
Weight	: 80 kg

Battery Rack

Wire length on Battery Rack	: 300 mm
Wire clip/clamp Material	: MS clip chrome plating
Dimension	: L 175 cm X W 107 cm X H 82 cm
Weight	: 120 kg
Material used	: MS with powder coating
Individual Battery Compartment	: L 17.5 cm X W 19.5 cm
Wheel Capacity	: 170 kg each, capable to handle total 680 kg Two wheel with brake and fix position

Connectors

40-pin connector	: MS3102R 28L-51p 43 pin male & female, 30 Amps
Internal connectors	: Molex connector 4 pin CPU st 5.08 male & female
Connecting Wires	: Polycab copper cable with PVC coating

3. Operating Procedure:

Step-1: Battery Connections:

1. Ensure that the battery is kept properly in space provided in the battery rack in a horizontal base.
2. Clean the battery terminals if required.
3. Check the Polarity of the battery terminal POSITIVE (**Pos., P, +**) and NEGATIVE (**Neg., N, -**).
4. Ensure that the Charging cables are connected with the correct polarity to the corresponding points of the battery.

Connect the **RED Probe** Positive Battery Terminal

Connect the **Black Probe** Negative Battery Terminal

5. Switch ON the “**MAINS ON / OFF**” Power switch on the front panel of individual charger.

Caution:

- Never switch ON the mains if the DC connection has not been done. i.e. First connect the battery to the charger and thereafter switch ON the Power switch of the individual charger.
- Ensure that the charging probes are connected tightly to the battery terminals so as to avoid sparks.
- If the DC- Polarity is incorrect the Yellow colour LED indicating “**Connection Polarity**” will glow.

Step – 2: Charger Connections:

1. Initially switch ON the AC mains switch then put on the MCB of charger.
2. Connect / disconnect the DC output terminals only when the power switch of the charger is in OFF position.

Step-3: Charger to Battery Rack Connection:

1. Ensure the MCB switch of the Charger Rack is in OFF position.
2. Ensure the connection between the Charger and Battery Rack is proper. Insert the cable to the 40-pin connector carefully and lock it by rotating and tightening the knob.

Step-4 : Select the Charging Current:

1. There are 2 Charging Currents 2A and 4A. This selection can be done by using the Toggle action switch indicated in Fig. 7. This selection is done depending on the Ah Capacity of the battery or as recommended by the battery manufacturer.



Fig. 7

Step-5 : Charging Process:

1. The Charging Cycle will start automatically within a few seconds.

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2. The total time taken by the charger to charge a battery is five hours or cut-off voltage of 14 Volts. It has three different modes for charging.

- **Stage - 1:** It is a Recovery Stage. In this stage the charger checks the battery condition, whether it is beneficial to charge the battery or not.
If the Battery Voltage is $> 5V$ but $< 16.5V$ the charging will shift to Stage 2
If not, it will indicate **“BAD BATTERY”** Such a battery cannot be charged further, hence has to be disconnected.
- **Stage – 2:** This is a boost charging stage. In this stage the battery is charging continuously @ $2A / 4A$ (as per the selection). When the battery is charged up to 90% to 95%, the charger automatically goes in the next stage that is stage 3.
- **Stage – 3:** In this stage the charger follows float mode of charging.
It provides current in pulse form for charging the battery, so that the life of the battery is not affected. After the completion of this stage, the battery gets charged completely LED indicating “Charge Finish” will glows in the charger. Now turn OFF the charger.

Note:

Once the charging is complete Turn-off the power switch on the Front Panel of the individual module. Thereafter, disconnect the Charging Clips from the battery terminals. Ensure that these clips do not touch each other. No manual intervention is required throughout the charging cycle. Charging will automatically stop once charging is complete.

Recognise the connected Battery compartment and charger module by simple number upon module, battery compartment and wires, so that the correct wires are connected to the accurate battery on compartment.

4. **Do's:**

- Battery Charging area should be clean, dry and well ventilated.
- Ensure that the battery and Charger terminals are clean.
- Power Input: $90 - 270 V_{AC}$, 50 Hz, Single Phase.
- Ensure that Input Mains have a proper Earthing.
- To reduce risk of electric shock, unplug the charger from AC outlet before attempting any cleaning or maintenance.
- The charger is equipped with an input power cord, do not operate charger with a damaged cord or plug - replace the cord or plug immediately.
- Ensure at least a gap of 2 inch is kept between Charger & Battery Rack.



- Clean the Battery Rack with dry cloth periodically.

5. **Don'ts:**

- Avoid Short Circuiting of Battery Charging Leads.
- Do not operate the charger with a damaged cord or plug – replace the cord or plug immediately.
- Do not disconnect the battery when the charging is on. Wait till the charging is completed and the Green colour LED indicating “Charge Finish” glows.
- Do not connect batteries in Series or parallel. Only one battery per Charging Module.
- Do not connect dead / damaged batteries.
- Do not expose the charger to water, or Acid.
- Do not use this charger under heavy lightening (Remove the main plug from the socket after switching off the mains MCB)
- Do not disassemble charger; call a qualified service centre when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
- Electrical Protection: Do not connect the wire terminals to the battery with wrong polarity, if connected the Yellow colour LED indicating “Connection Polarity” will glows.
- Do not keep battery on top of the charger during storage.
- Do not keep Battery or hit on Battery leads of the rack
- Do not use the battery rack to carry or ship any other material

6. **Personal Safety Instructions:**

- NEVER smoke or allow a spark or flame in the vicinity of the battery or the charger.
- Be extra cautious to reduce the risk of dropping a metal tool on to the battery either while charging or when stored. It might spark or short – circuit the battery or other electrical parts that could cause an explosion.
- Long Idle Period: Turn off the main MCB switch and disconnect the power cable when the unit is not being used for a long period of time.
- Always take care not to touch the Charging Terminals, with a bare hand. Ensure that the Charging probes are inserted firmly to the Battery with the correct polarity.

7. **Precautions:**

- Charger not starting:
 - Check the MCB of the charger. If it is faulty, use same rating (40 Amps, 415 Volts)
Check input supply.(>90V)
 - Check if the proper Earthing is available.

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- Check Connection Polarity
- Check if the correct polarity is connected (Red cable to +ve & Black cable to -ve)
- Check if the battery is damaged/shorted.

8. Disassembling:

Step 1



Remove these four screws (indicated in picture) of the module

➤ Step 2



Slide the module outwards firmly

➤ Step 3



Detach the clip to free the module

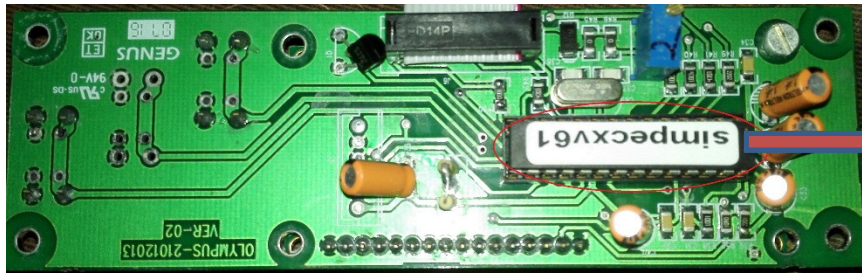
9. Assembling:

Follow the reverse of the simple steps adopted during the dismantling the module (From step 3 to Step 1).

10. PCBs

MXV Display PCB:

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Microcontroller

MXV Power PCB:



Capacitors
(C13 & C14)

Transistors (Q1 & U4)

Resistors (R7)

Diode (D9)

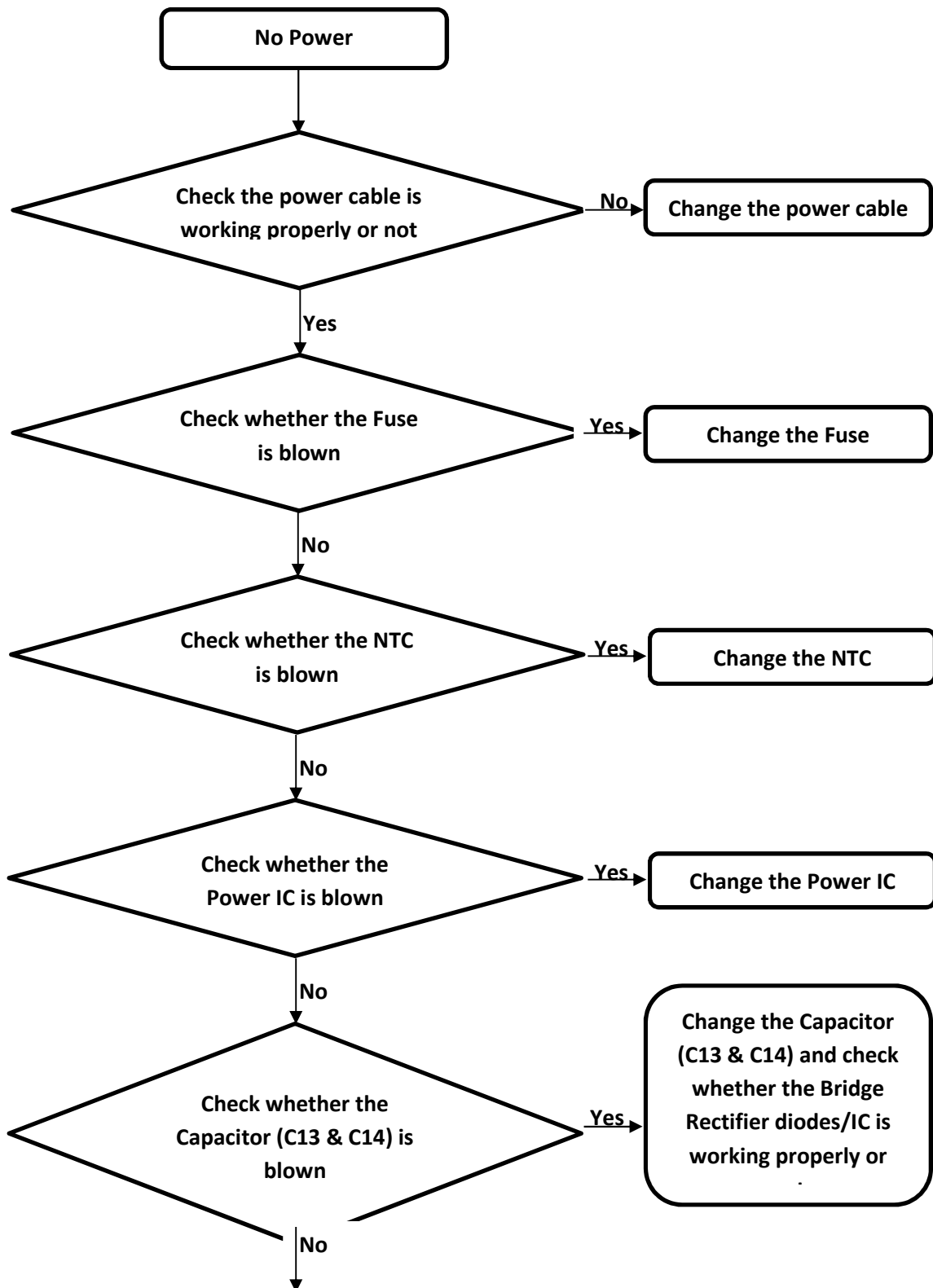
Power IC

NTC

11. Troubleshoot:



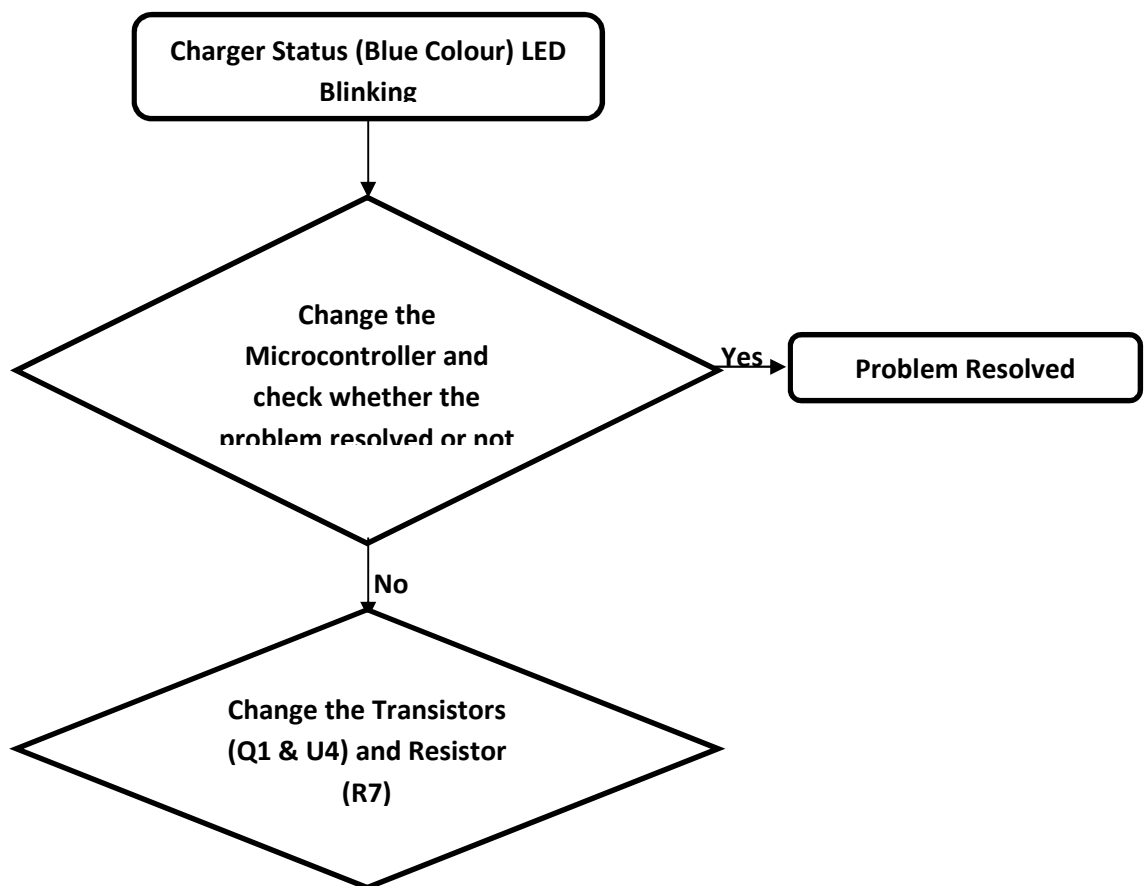
1. Not Getting ON



P.T.O



2. Charger Status (Blue Colour) LED Blinking





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