



OptiMATE 4 Quad Program TM600 Series Instruction Manual

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OptiMATE

OptiMATE 4 Quad Program TM600 Series



Product Information

The Quad Program is a battery charger designed for use with 12V lead-acid batteries and 12.8V LiFePO4 batteries. It is available in multiple models: TM630, TM631, TM632, TM638, TM640, TM641, TM642, and TM648. The charger operates on a DC power supply of 12V with a current rating of 1.25A. It is compatible with STD/AGM-MF/GEL lead-acid batteries ranging from 4Ah to 60Ah (maximum Ah based on a 48-hour charge) and LiFePO4 batteries ranging from 1.25Ah to 15Ah (maximum Ah based on a 12-hour charge).

Product Usage Instructions

IMPORTANT: Read the following instructions completely before charging.

General Battery Charger Precautions

Ensure that the AC input rating in amperes is equal to or greater than the length of the cord in AWG size, as specified in the table below:

AC INPUT RATING IN AMPERES	LENGTH OF CORD, FEET (m)	AWG SIZE OF CORD
2A	25 (17.6)	18
3A	50 (15.2)	18
—	100 (30.5)	14

Warning – Risk of Explosive Gases

When working with lead-acid batteries, be cautious of the risk of explosive gases. Follow the instructions provided and those published by the battery manufacturer and any equipment manufacturer used near the battery.

Personal Precautions

- Ensure someone is within range of your voice or close enough to come to your aid.
- Remove AC cord from the socket before connecting or disconnecting the charger from the battery.
- Place the battery in a well-ventilated area.

Charging a Battery Installed in a Vehicle Using Battery Clips

To reduce the risk of a spark near the battery, follow these steps:

1. Position the AC and DC cords to minimize the risk of damage by the vehicle or moving metal parts.
2. Connect the charger clips to the battery terminals, ensuring proper polarity.
3. Turn on the charger and select the appropriate program for the battery type (Pb or LFP).
4. Monitor the charging process using the LED indicators.
5. When disconnecting the charger, turn off the switches, disconnect the AC cord, remove the clip from the vehicle chassis, and then remove the clip from the battery terminal.

Charging a Battery Outside of the Vehicle or Removed from the Vehicle

To reduce the risk of a spark near the battery, follow these steps:

1. Position the AC and DC cords to minimize the risk of damage.
2. Connect the charger clips to the battery terminals, ensuring proper polarity.
3. Turn on the charger and select the appropriate program for the battery type (Pb or LFP).
4. Monitor the charging process using the LED indicators.
5. When disconnecting the charger, turn off the switches and remove the clips from the battery terminals.

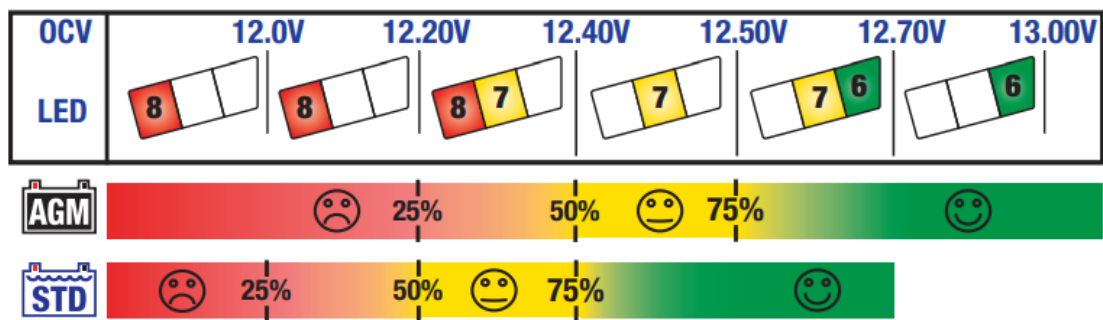
IMPORTANT SAFETY INSTRUCTIONS

It is crucial to read and understand all safety instructions before using the battery charger. Save these instructions for future reference.

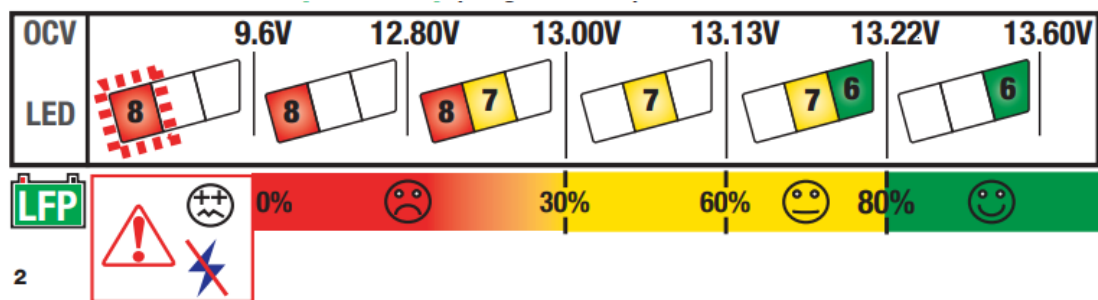
PRODUCT FUNCTION



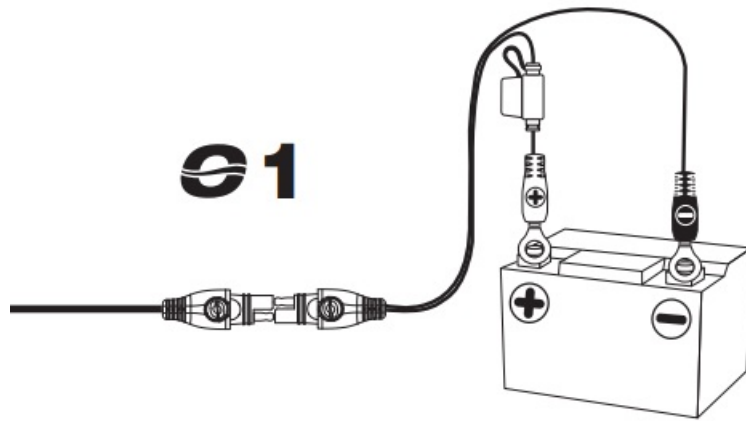
S.O.H. TEST – Pb (Program 1 & 2)



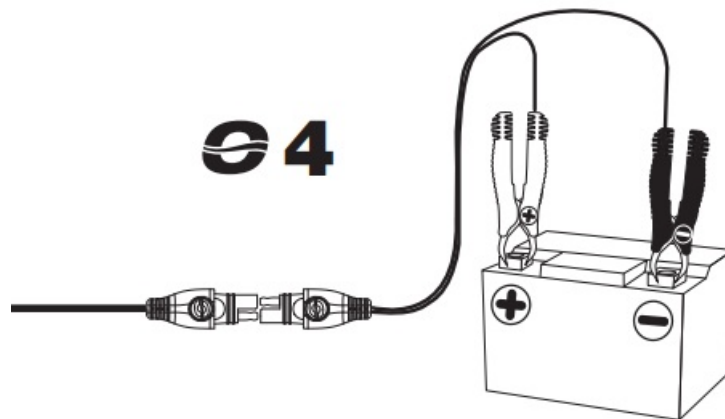
S.O.H. TEST – LFP (LiFePO4) (Program 3 & 4)



O-1 permanent battery lead



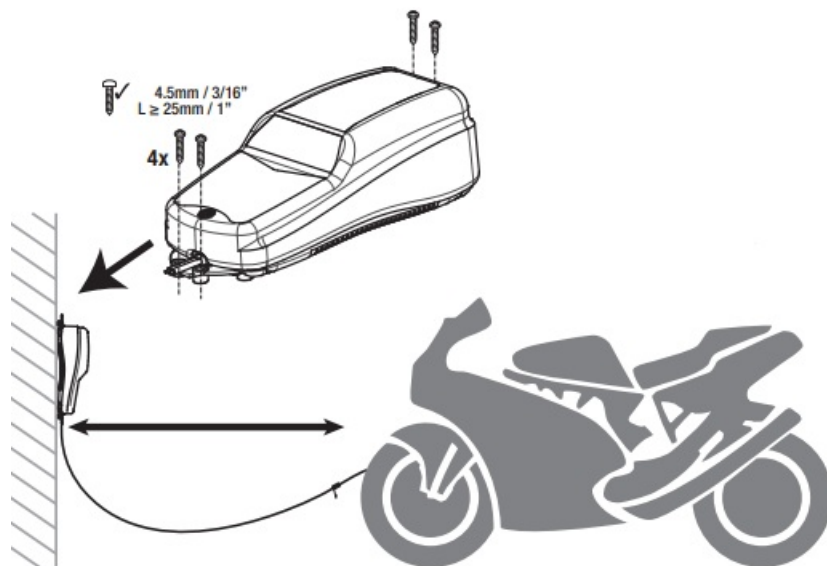
O-04 clips (battery clamps) – charge battery out of the vehicle



O-19 adapter with DIN/ISO 4165 plug
O-19 Cable / Adapter



MOUNTING NOTICE



IMPORTANT SAFETY INSTRUCTIONS – SECTION A.

SAVE THESE INSTRUCTIONS. IT IS OF THE UTMOST IMPORTANCE THAT EACH TIME, BEFORE USING THE BATTERY CHARGER, YOU COMPLETELY FAMILIARIZE YOURSELF WITH THESE SAFETY INSTRUCTIONS.

AUTOMATIC BATTERY CHARGER FOR 12V LEAD-ACID & 12.8V LiFePO₄ BATTERIES. DO NOT USE FOR NiCd, NiMH, or any other types of Li-Ion OR NON- RECHARGEABLE BATTERIES.

1. GENERAL BATTERY CHARGER PRECAUTIONS.

CAUTION : DO NOT CONNECT TO GROUND. Do not expose charger to rain or snow. Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons. To reduce risk of damage to electric plug and cord/cable, pull by plug rather than cord/cable when disconnecting charger. Do not operate charger with damaged cord or plug – If the cable is damaged, it is essential to have it replaced without delay by the manufacturer, an authorised service agent or a qualified workshop, to avoid danger. Do not operate charger if it has received a sharp blow, been dropped, or has been otherwise damaged in any way; take it to a qualified Service Technician. Do not disassemble charger; take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire. Before attempting any maintenance or cleaning, to reduce risk of electric shock, unplug the charger from the AC outlet and the battery. Clean only with slightly moist, not wet, cloth. Do not use solvents.

2. AC EXTENSION CORDS/CABLES.

An extension cord/cable should not be used unless absolutely necessary. Use of improper extension cord could result in a risk of fire and electric shock. If extension cord must be used make sure that :

- pins on plug of extension cord are the same number, size and shape as those of plug on charger,
- the extension cord is properly wired and in good electrical condition, and c) the conductor wire size is large enough for the AC ampere rating of the charger as specified in the table below.

AC INPUT RATING IN AMPERES		LENGTH OF CORD, FEET (m)	AWG SIZE OF CORD
Equal to or greater than	But less than		
2A	3A	25 (17.6)	18
		50 (15.2)	18
		100 (30.5)	14

3. WARNING – RISK OF EXPLOSIVE GASES.

- Working in the vicinity of a battery is dangerous. Lead-acid batteries generate explosive gasses during normal battery operation. For this reason it is of utmost importance that you follow the instructions each time you use the charger.
- To reduce risk of battery explosion, follow these instructions and those published by the battery manufacturer and manufacturer of any equipment you intend to use in vicinity of the battery. Review cautionary marking on these products and on engine.

4. PERSONAL PRECAUTIONS:

- Someone should be within range of your voice OR close enough to come to your aid when you work near a lead-acid battery.
- Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes.
- Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
- If battery acid contacts or enters eye, flood eye with cold running water for at least 10 minutes and get medical attention immediately. If battery acid contacts skin or clothing, wash immediately with soap & water.
- NEVER smoke or allow a spark or flame in vicinity of battery or engine. f) Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit the battery or other electrical part that may cause explosion. g) Remove personal metal items such as rings, bracelets, necklaces, and watches when working with any battery. A lead-acid or lithium battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn. h) NEVER charge a frozen battery.

5. CHARGER LOCATION:

- Do not operate charger in a closed-in area or restrict ventilation in any way.
- Locate charger as far away from battery as DC cables permit.
- Never place charger directly above battery being charged; gases from battery can corrode and damage the charger.
- Never allow battery acid to drip on charger when reading gravity or filling battery.
- Do not set a battery on top of charger.

IMPORTANT : Place charger on a hard flat surface or mount onto a vertical surface. Do not place on plastic, leather or textile surface.

6. DC CONNECTION PRECAUTIONS:

- Connect and disconnect DC output clips only after removing AC cord from electric outlet. Never allow clips to touch each other.
- Attach clips to battery and chassis as indicated in 8(e), 8(f), and 9(a) through 9(d).

NOTE : This battery charger has an automatic safety feature that will prevent it from operating if the

battery has been inversely connected. Remove AC cord from electrical outlet, disconnect the battery clips, then reconnect correctly according to the instructions below.

7. PREPARING THE BATTERY:

- If the battery is new, before connecting the charger read the battery manufacturer's safety and operational instructions carefully. If applicable, carefully and exactly follow acid filling instructions.
- If it is necessary to remove battery from vehicle to charge, make sure all accessories in the vehicle are off, so as not to cause an arc. First remove grounded terminal (normally marked NEGATIVE (NEG, N, -) from battery first, then the terminal marked POSITIVE (POS, P, +).
- Place the battery in a well ventilated area.
- Visually check the battery for mechanical defects such as a bulging or cracked casing, or signs of electrolyte leakage. If the battery has filler caps and the plates within the cells can be seen from the outside, examine the battery carefully to try to determine if any cells seem different to the others (for example, with white matter between the plates, plates touching).
If mechanical defects are apparent do not attempt to charge the battery, have the battery professionally assessed.
- Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
- For lead-acid batteries with removable filler caps, add distilled water in each cell until battery acid reaches level specified by battery manufacturer. This helps purge excessive gas from cells. Do not overfill.
- For a battery without cell caps, such as valve regulated lead-acid (VRLA), absorbed glass mat (AGM) lead-acid or Lithium (LiFePO₄) batteries, carefully follow manufacturer's recharging instructions.
- Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
- Determine voltage of battery by referring to vehicle or other user's manual and before making the battery connections, make sure that the voltage of the battery you are going to charge matches the output voltage of the battery charger.

8. FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE AND YOU CHOOSE TO USE BATTERY CLIPS TO CHARGE THE BATTERY. A SPARK NEAR A BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

- Position AC and DC cords so as to reduce risk of damage by the vehicle itself or moving engine parts.
- Stay clear of fan blades, belts, chains, sprockets, pulleys, and other vehicle parts that can cause injury to persons or damage to the charger and its cords/cables.
- Check polarity of battery posts. On automotive batteries POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, -) post.
- Determine which post of battery is grounded (connected) to the chassis.
If negative post is grounded to chassis (as in most modern vehicles), see (e). If positive post is grounded to the chassis, see (f).
- For negative-grounded vehicle, connect POSITIVE (RED) clip from battery charger to POSITIVE (POS, P, +) ungrounded post of battery. Connect NEGATIVE (BLACK) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gage metal part of the frame or engine block.
- For positive-grounded vehicle, connect NEGATIVE (BLACK) clip from battery charger to NEGATIVE (NEG, N, -) ungrounded post of battery. Connect POSITIVE (RED) clip to vehicle chassis or engine

block away from battery. Do not connect clip to carburettor, fuel lines, or sheet-metal body parts. Connect to a heavy gage metal part of the frame or engine block.

- When disconnecting charger, turn switches to off, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal. h) See operating instructions for length of charge information.

9. FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE OF THE VEHICLE OR HAS BEEN REMOVED FROM THE VEHICLE. A SPARK NEAR THE BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

- Check polarity of battery posts. The POSITIVE (POS, P, +) and NEGATIVE (NEG, N, -) battery posts will be clearly marked.
- Connect the POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.
- Then connect the NEGATIVE (BLACK) charger clip to the NEGATIVE (NEG, N, -) post of the battery.
- When disconnecting charger, always do so in reverse sequence of connecting procedure & break first connection while as far away from battery as practical.

10. SAFE USE BY MINORS OR PERSONS WITH REDUCED CAPABILITIES:

- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge only if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- Choking Hazard. Accessories may present a choking hazard to children. Do not leave children unattended with product or any accessory. The product is not a toy.

11. RADIO FREQUENCY INTERFERENCE: The OptiMate DUO complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

1. this device may not cause harmful interference
2. this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

12. PROPOSITION 65, STATE OF CALIFORNIA: Battery posts / terminals, and related accessories may contain chemicals, including lead or sulphuric acid. These materials are known to the State of California to cause cancer and birth defects and other reproductive harm

CONNECTION ACCESSORIES

Three interchangeable connection sets are supplied with the battery charger (illustrations on pages 3 & 4).

1. A battery lead (O-01) with metal eyelet lugs for permanent fitment to the battery posts, with re-sealable weatherproof cap on the SAE connector that connects to the charger output cable. Consult a professional service agent for assistance in attaching the metal eyelets to the battery posts. Secure the connector with weatherproof cap so that it cannot foul any moving part of the vehicle or the cable can be pinched or damaged by sharp edges.

IMPORTANT: This battery lead is protected by a 15A fuse. If under any circumstance the fuse blows, do not try and replace the fuse without first identifying and correcting the issue that caused the fuse to blow. Only replace the fuse with a 15A rated ATO fuse.

2. A SAE to DIN plug adapter (O-19), to charge through a DIN /ISO 4165 12V power socket:
 1. The auxiliary DIN socket on BMW motorcycles (Models: from 2004) can receive charge and maintenance even with ignition turned off, when using a CAN-bus charge mode on OptiMate4 Quad program.
 2. Other vehicles fitted with a DIN socket: if the 12V DIN socket remains continuously powered up after the ignition has been turned off, charge & maintenance can be delivered via the socket.Find more DIN/ISO 4165 accessories at www.optimate1.com.
3. A set of battery clips (O-04), recommended for charging the battery off-vehicle or when the battery needs a recovery charge. Read Section A > IMPORTANT SAFETY INSTRUCTIONS points 8 or 9 before connecting to the battery.

PROCEEDING TO CHARGE

SELECTING A CHARGE PROGRAM:

OptiMate4 Quad program has four selectable charge programs. A charge program must be selected before making connection to a battery. Each program has unique charge and test parameters to match the battery's chemistry and connection method to the battery. The selected program remains in memory after disconnection from the battery, or if AC power is interrupted, or until a new selection is made.

- **PROGRAM 1 – Pb (LED #1a) :** is the direct-to-battery charge program for a lead-acid battery in any condition. All program features are active, including high voltage TURBO and PULSE desulfation mode.
- **PROGRAM 2 – Pb (LED #1a) + CAN-bus (LED #2):** automatically activates charging for a lead-acid battery through the 12V outlet on vehicles fitted with a CAN-bus controlled 12V outlet, to charge, test and maintain a healthy battery when the vehicle is in storage. All desulfation modes are de-activated. The CAN-BUS (LED #2) blinks until a battery is sensed, then it turns full on.

IMPORTANT: FLAT BATTERY (< 5V) – if the vehicle's lead-acid battery is deep discharged the vehicle's CAN-bus system will not be able to activate the 12V socket. Remove the battery, inspect it for physical damage or leakage, if deemed acceptable, to recharge select Program 1 and connect the OptiMate4 directly to the battery.

- **PROGRAM 3 – LFP (LED #1b):** is the direct-to-battery charge program for a LiFePO4 (Lithium Ferrous Phosphate) battery in any condition.

Use this program to reset a battery fitted with integrated battery management system (BMS) that protect against deep discharge.

IMPORTANT! Before proceeding, confirm the battery is connected correctly: Read the section on the previous page: CONNECTING CHARGER TO THE BATTERY.

- **Press the pushbutton**

After 3 seconds LED #3 lights every second as a special BMS reset pulse is delivered. When the OptiMate 4 senses the battery BMS has reset the reset pulses will automatically discontinue and charging will automatically continue. Remove finger from pushbutton.

- **BMS not resetting:**

LED #3 lights briefly and then turns off: A deep discharged battery may not hold sufficient voltage to power its own BMS system. Use the MANUAL RESET: place and hold finger on BMS reset button for 10 or more seconds, until the program continues to STEP 4.

- **BMS not resetting:**

LED #8 flashes/blinks.


1. Battery is connected in reverse polarity. Correct the connections and try again.
2. The system powered by the battery is preventing the pulse from being delivered. Disconnect or turn off the system and try again.
3. The battery's BMS or the battery itself may have suffered damage. Have the battery professionally assessed.

- **More:** An advanced battery management system may include thermal protection that prevents reset if the battery temperature falls outside of the manufacturer recommended safe operating temperature range. Check battery manufacturer's specifications.
- **PROGRAM 4 – LFP (LED #1b) + CAN-bus (LED #2):** automatically activates charging through the 12V outlet on vehicles fitted with a CAN-bus controlled 12V outlet, to charge, test and maintain a healthy LiFePO₄ (Lithium Ferrous Phosphate) battery when the vehicle is in storage. The CAN-BUS (LED #2) blinks until a battery is sensed, then it turns full on.

IMPORTANT: FLAT BATTERY (< 9V) – if the vehicle's LFP/Lithium battery is deep discharged or the battery's BMS system has turned off power within, the vehicle's CAN-bus system will not be able to activate the 12V socket. Remove the battery, inspect it for physical damage or leakage, if deemed acceptable, to recharge select Program 3 and connect the OptiMate4 directly to the battery.

- **VERY FLAT NEGLECTED BATTERIES:** If the battery is deeply discharged (and possibly sulfated), remove from the vehicle or equipment and inspect the battery before connecting the charger for a recovery attempt. ATTENTION: A battery left deep-discharged for an extended period may develop permanent damage in one or more cells. Such batteries may heat up excessively during high current charging. Monitor the battery temperature during the first hour, then hourly there-after. Check for unusual signs, such as bubbling or leaking electrolyte, heightened activity in one cell compared to others, or hissing sounds. If at any time the battery is uncomfortably hot to touch or you notice any unusual signs, DISCONNECT THE CHARGER IMMEDIATELY.
- **CHARGING TIME :** Charge time on a flat but otherwise undamaged battery: a 12Ah battery should take no more than about 12 hours to progress to the self-discharge check. Deep-discharged batteries may take significantly longer.
- **MAINTAINING A BATTERY FOR EXTENDED PERIODS:** OptiMate 4 Quad Program is designed to maintain a battery continuously (24-7); it can be safely left connected to a healthy battery for months at a time.
- **RECOMMENDED:** At least once every two weeks, check that the connections between the charger and battery are secure. In the case of lead-acid batteries with filler caps on each cell, disconnect the battery from the charger, check the level of the electrolyte and if necessary, top up the cells (with distilled water, NOT acid), then reconnect. When handling batteries or in their vicinity, always take care to observe the SAFETY WARNINGS above.

<p>Program selection</p>	<p>Changing selection: Disconnect OptiMate4 from the battery or vehicle. Push and release the pushbutton switch. The mode selection changes when the button is released. Continue to press and release until the desired program has been selected. If no further selection is made for at least 3 seconds SAVE (#3), CHARGE (#4), OPTIMIZE(#5) and TEST (#6, 7, 8) LEDs flash twice to confirm selection is in memory. Connect OptiMate4 to the battery or vehicle.</p> <p>ATTENTION: Each program is described in detail on the preceding page.</p> <p><u>For 12V lead-acid (Pb) batteries:</u> PROGRAM 1 (LED #1a) : Charge directly to battery. PROGRAM 2 (LED #1a) + CAN-bus (LED #2): Charge via CAN-bus controlled 12V outlet on BMW motorcycles.</p> <p><u>For 12.8V / 13.2V lithium LFP / LiFePO₄ batteries:</u> PROGRAM 3 (LED #1b) : Charge directly to battery. PROGRAM 4 (LED #1b) + CAN-bus (LED #2): Charge via CAN-bus controlled 12V outlet on BMW motorcycles.</p>
<p>STEP 1 Low Volt START - Bat ≥ 0.5V</p>	<p>Battery voltage check - OptiMate 4 automatically activates if Programs 1 & 3 : connected battery voltage is at least 0.5 Volt.</p> <p>Programs 2 & 4 : LED #2 changes state from blinking to full on, indicating the CAN-bus controlled 12V outlet has turned on and is allowing the battery to receive a charge.</p> <p>For LiFePO₄ batteries with resettable protection (BMS) - See SELECTING A CHARGE PROGRAM > PROGRAM 3 > BMS RESET how to activate charging. Charging proceeds directly to STEP 3.</p>
<p>STEP 2 Protection / Manual activation</p> <p>Charger will not proceed without user interaction.</p>	<p>REVERSE POLARITY PROTECTION: LED #1a / LED #1b blinks rapidly when the battery connections are incorrect. The charger is electronically protected so no damage will result, and the output will remain disabled until the connections are corrected.</p> <p>MANUAL ACTIVATION for LiFePO₄ batteries with resettable protection (BMS) - See SELECTING A CHARGE PROGRAM > PROGRAM 3 > BMS RESET how to manually activate charging.</p> <p>CAN-bus programs 2 & 4 : Not activating? Consult troubleshooting guide on page 11.</p>
<p>STEP 3 PRE-TEST</p>	<p>Immediately following connection to a battery there may be a 1-2 second delay before charging progresses, during which time battery State Of Charge is measured to determine charge requirement and duration of the State Of Health test in STEP 8.</p>
<p>STEP 4 & 5 SAVE - LED #3</p> <p>State of charge: < 50% or Pb (lead-acid) < 12.4V or LFP (LiFePO₄) < 13.1V</p>	<p>Charge time : Program 1 & 2: 15min to 2hrs. Program 3 & 4: up to 6 hours.</p> <p>IMPORTANT: Read section VERY FLAT NEGLECTED BATTERIES prior.</p> <p>A battery diagnosed as deep discharged undergoes a multi-step reconditioning process appropriate for the selected battery chemistry and connection method (direct / CAN-bus), is tested to confirm it's state of health before proceeding to STEP 6.</p> <p>RECOMMENDED: Always charge a deep discharged / low voltage battery after it has been disconnected from the vehicle's circuitry, to avoid adverse influence by the vehicle's circuitry on charge & test progress.</p> <p>Program 1 (Pb) : If vehicle circuitry has been detected charge voltage is limited to 14.5V. Otherwise voltage may briefly rise as high as 22V to overcome sulphation within the battery. A sufficiently recovered battery proceeds to STEP 6.</p> <p>Program 2 (Pb + CAN-bus) : Maximum charge voltage is limited to 14.5V. A healthy Pb (lead-acid) battery will progress to STEP 6.</p> <p>Program 3 (LFP) : OptiMate's proprietary Lithium reconditioning mode is activated. Current starts at 0.2A and will increase towards 0.8A depending on charge progress. The battery's ability to accept and hold charge is monitored. A healthy LiFePO₄ battery will progress to STEP 5 within 6 hours.</p> <p>Program 4 (LFP + CAN-bus) : The battery's ability to accept and hold charge is confirmed. A healthy LiFePO₄ battery will progress to STEP 6 within 6 hours.</p> <p>Program 3 and 4: TEST LED #8 (red) flashing rapidly - <i>Abnormal charging or battery damage has been detected and charging has been suspended. Consult the TROUBLESHOOTING GUIDE on page 11.</i></p>
<p>STEP 6 CHARGE - LED #4</p> <p>State of charge: ≥ 50%</p>	<p>Engages if the battery state of charge was 50% or higher (as tested in STEP 3) or once the battery has sufficiently recovered during STEP 4 & 5.</p> <p>A current of up to 1.25A is delivered to the battery up to a voltage of 14.3 - 14.5V.</p> <p>NOTES: For a healthy battery charging always starts at STEP 6. A battery with a higher level of charge will progress faster through STEPS 6 and 7.</p>
<p>STEP 7 OPTIMIZE - LED #5</p> <p>State of charge: ≥ 75%</p>	<p>Engages when the voltage has reached 14.3V for the first time during STEP 6 - CHARGE mode.</p> <p>The charge program now equalises the individual cells within the battery and optimizes charge level. Voltage may vary frequently between 13.6V and 14.5V.</p> <p>NOTE: Charge time is usually extended if there is higher than expected current draw by connected circuitry or battery health is less than optimal.</p> <p>For safety reasons there is an overall charge time limit of 48 hours for STEP 4, 5, 6 and 7.</p>
<p>STEP 8 TEST after charge - LED #6</p>	<p>Delivery of current to the battery is interrupted for 30 minutes** to allow the program to determine the battery's ability to retain charge.</p> <p>** IF charging started in SAVE mode (LED #3) the voltage retention test is extended to 12 hours to confirm battery health.</p> <p>LED #6 (green) will remain on for batteries able to hold 90% or higher state of charge (SOC%), otherwise the TEST result is adjusted lower (LED #7, LED #8) in real time according to the measured battery voltage. Consult the table on page 2 to match TEST LED indication to an estimated state of charge percentage (SOC%). Also read section "NOTES ON TEST RESULTS" below.</p>

<p>STEP 9 OptiMATE '365' MAINTAIN - LED #6 / 7 / 8 ON</p> 	<p>MAINTENANCE CHARGE: LED #6 / 7 / 8 steady on according to state of charge measured during STEP 8.</p> <p>Float voltage setting: 13.6V. The general maintenance program consists of 30 minute float charge periods, followed by and alternating with 30 minute 'rest' periods, during which there is no charge delivered. Additional adjustments are made for different battery chemistries.</p> <p>Programs 1 & 2 (Pb battery) : The "50% duty cycle" maintenance program for lead-acid batteries prevents loss of electrolyte in sealed batteries and minimizes gradual loss of water from the electrolyte in batteries with filler caps, and thereby contributes significantly to optimizing the service life of irregularly or seasonally used batteries. During "float charge" a continuous LOW CURRENT PULSE IS DELIVERED TO PREVENT SULFATION, further extending battery power and life.</p> <p>LED indication: For batteries with a good state of health LED #6 (green) will remain on. Exception: STD wet cell batteries with filler caps have a lower fully charged voltage: LED #6 remains on together with LED #7.</p> <p>Programs 3 & 4 (LFP battery) : The OptiMATE Lithium maintenance program is fully automatic, it continuously monitors the battery voltage and delivers current only if it sensed the battery has lost charge (possibly through connected vehicle or other circuitry or self discharge). This Lithium specific maintenance program guarantees the battery will remain at or close to full charge, but never overcharged.</p> <p>LED indication: For batteries with a good state of health LED #6 (green) will remain on.</p>
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- **NOTES ON TEST RESULTS:** The voltage of a cooled battery is directly proportional to its State Of Charge percentage (SOC%). Immediately following charging a battery may briefly hold a higher voltage, as charging raises the temperature of chemical elements within the battery. A battery recovered from a deep discharged state may need longer to cool and voltage to settle to reflect its true state of charge (SOC%).

TROUBLESHOOTING GUIDE

<p><u>OPTIMATE 4 W ON'T CHARGE</u></p>	<p>1) Battery in vehicle, CAN-bus program 2 or 4 selected > Battery voltage may be too low to power vehicle's CAN-bus system.</p> <p>a) Program 2 (Pb) : Minimum 5V required. Disconnect battery from vehicle, select program 1 and charge directly to battery.</p> <p>b) Program 4 (LFP) : Minimum 8.8V min. required. Disconnect battery from vehicle, select program 3 and charge directly to battery.</p> <p>2) Poor connection to the 12V outlet – check connector / try charge direct to battery.</p> <p>3) Outdated CAN-bus programming on the vehicle</p> <p>– <i>consult with the vehicle manufacturer.</i></p>	<p>4) Battery in vehicle, program 1 or 3 selected – Battery voltage is below 0.5V.</p> <p>a) Program 1 or 3 : Disconnect battery from vehicle, wait 5-10 minutes for battery to recover voltage and try again.</p> <p>b) Program 3 (LFP): Battery with resettable BMS – disconnect battery from vehicle and then use BMS reset procedure.</p> <p>If OptiMate 4 still does not charge, then have the battery professionally assessed, or replace battery.</p>
<p><u>ERROR!</u></p> <p>LED 8 flashing / blinking.</p>	<p>1) LFP battery in vehicle, Program 3 or 4 : abnormal charging or battery damage has been detected. Disconnect battery from vehicle circuitry, select program 3 and charge direct to battery.</p>	<p>2) Program 3 for Li-Ion / LFP, battery NOT connected to vehicle circuitry. <i>Battery has permanent damage. Do not charge again. Replace the battery.</i></p>
<p><u>TEST RESULT</u></p> <p>LED 5 & 6</p>	<p>1) Battery in vehicle –</p> <p>a) Program 1 & 2 (Pb): STD 'flooded' battery: Good > 80%-100%</p> <p>b) AGM / LFP battery: 60-80%. Vehicle electronics may be drawing power and discharging the battery. Disconnect from vehicle circuitry and charge again.</p>	<p>2) Battery NOT connected to vehicle circuitry –</p> <p>a) Program 1 & 2 (Pb): STD 'flooded' battery: State of Health (S.O.H.) is good > 80%-100%.</p> <p>b) AGM / LFP battery : 60-80%. <i>Battery has lost power and may need to be replaced soon.</i></p>

<p><u>OPTIMATE 4 W ON'T CHARGE</u></p>	<p>1) Battery in vehicle, CAN-bus program 2 or 4 selected > Battery voltage may be too low to power vehicle's CAN-bus system.</p> <p>a) Program 2 (Pb) : Minimum 5V required. Disconnect battery from vehicle, select program 1 and charge directly to battery.</p> <p>b) Program 4 (LFP) : Minimum 8.8V min. required. Disconnect battery from vehicle, select program 3 and charge directly to battery.</p> <p>2) Poor connection to the 12V outlet – check connector / try charge direct to battery.</p> <p>3) Outdated CAN-bus programming on the vehicle</p> <p>– <i>consult with the vehicle manufacturer.</i></p>	<p>4) Battery in vehicle, program 1 or 3 selected – Battery voltage is below 0.5V.</p> <p>a) Program 1 or 3 : Disconnect battery from vehicle, wait 5-10 minutes for battery to recover voltage and try again.</p> <p>b) Program 3 (LFP): Battery with resettable BMS – disconnect battery from vehicle and then use BMS reset procedure.</p> <p>If OptiMate 4 still does not charge, then have the battery professionally assessed, or replace battery.</p>
<p><u>ERROR!</u></p> <p>LED 8 flashing / blinking.</p>	<p>1) LFP battery in vehicle, Program 3 or 4 : abnormal charging or battery damage has been detected. Disconnect battery from vehicle circuitry, select program 3 and charge direct to battery.</p>	<p>2) Program 3 for Li-Ion / LFP, battery NOT connected to vehicle circuitry. <i>Battery has permanent damage. <u>Do not charge again.</u> Replace the battery.</i></p>
<p><u>TEST RESULT</u></p> <p>LED 5 & 6</p>	<p>1) Battery in vehicle –</p> <p>a) Program 1 & 2 (Pb): STD 'flooded' battery: Good > 80%-100%</p> <p>b) AGM / LFP battery: 60-80%. Vehicle electronics may be drawing power and discharging the battery. Disconnect from vehicle circuitry and charge again.</p>	<p>2) Battery NOT connected to vehicle circuitry –</p> <p>a) Program 1 & 2 (Pb): STD 'flooded' battery: State of Health (S.O.H.) is good > 80%-100%.</p> <p>b) AGM / LFP battery : 60-80%. <i>Battery has lost power and may need to be replaced soon.</i></p>

ECO POWER SAVING MODE WHEN THE CHARGER IS CONNECTED TO AC SUPPLY:

The power converter switches to ECO mode when the charger is not connected to a battery resulting in a very low power draw of less than 0.5W, equivalent to power consumption of 0.012 kWh per day. When a battery is connected to the charger power consumption depends on the current demand of the battery and its connected vehicle / electronic circuitry. After the battery has been charged and the charger is in long term maintenance charge mode (to keep the battery at 100% charge) the total power consumption is estimated to be 0.024kWh or less per day.

LIMITED WARRANTY

TecMate (International) SA, B-3300 Tienen, Belgium, offers this limited warranty to the original purchaser at retail of this product. This limited warranty is not transferable. TecMate (International) warrants this battery charger for three years from date of purchase at retail against defective material or workmanship. If such should occur the unit will be repaired or replaced at the option of the manufacturer. It is the obligation of the purchaser to forward the unit together with proof of purchase (see NOTE), transportation or mailing costs prepaid, to the manufacturer or its authorized representative. This limited warranty is void if the product is misused, subjected to careless handling, or repaired by anyone other than the factory or its authorized representative. The manufacturer makes no warranty other than this limited warranty and expressly excludes any implied warranty including any warranty for consequential damages.


THIS IS THE ONLY EXPRESS LIMITED WARRANTY AND THE MANUFACTURER NEITHER ASSUMES NOR AUTHORIZES ANYONE TO ASSUME OR MAKE ANY OTHER OBLIGATION TOWARDS THE PRODUCT OTHER

THAN THIS EXPRESS LIMITED WARRANTY. YOUR STATUTORY RIGHTS ARE NOT AFFECTED.
NOTE: Details at www.tecmate.com/warranty.

WARRANTY in Canada, USA, Central America and South America:

- TecMate North America, Oakville, ON, Canada, as a wholly owned subsidiary of TecMate International, assumes the responsibility for product warranty in these regions.
- More information on TecMate products can be found at www.tecmate.com.

Documents / Resources

	<p>OptiMATE 4 Quad Program TM600 Series [pdf] Instruction Manual TM630, TM631, TM632, TM638, TM640, TM641, TM642, TM648, 4 Quad Program TM600 Series, 4 Quad Program, TM600 Series</p>
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References

-  [Home - OptiMate](#)
-  [Home - OptiMate](#)
-  [TecMate – High Performance Battery Chargers, Tools & Accessories](#)
-  [Service and Warranty – TecMate](#)