AMT 12-2 Trickle Charger / Battery Maintainer

AMT 12-2 Installation Instructions

The Ablemail AMT 12-2 is a Trickle Charger / Battery Maintainer designed to maintain the vehicle starter battery at full charge when a solar or mains charger is being used to charge a leisure (auxiliary) battery. The AMT 12-2 automatically monitors the voltage of both batteries and transfers charge from the leisure battery to the vehicle battery when the programmed voltage conditions are met. The unit will charge the vehicle battery when:

- The leisure battery voltage is above its selected voltage threshold.
- The vehicle battery voltage is below its selected voltage threshold.

The charging current and operating cycle depend on the selected programme:

Operating Settings	Maximum Charging Current	Charging Cycle
Settings 1–4	2A	6 seconds ON / 15 seconds OFF
Settings 5–8	3A	10 seconds ON / 15 seconds OFF

The AMT 12-2 also incorporates a charge-pooling function to optimise charge retention across both batteries.

Charging will take place when:

- The leisure battery voltage is at least 0.3V higher than the vehicle battery voltage (or 1.0V higher when using Lithium batteries).
- The vehicle battery voltage is below 12.1V.

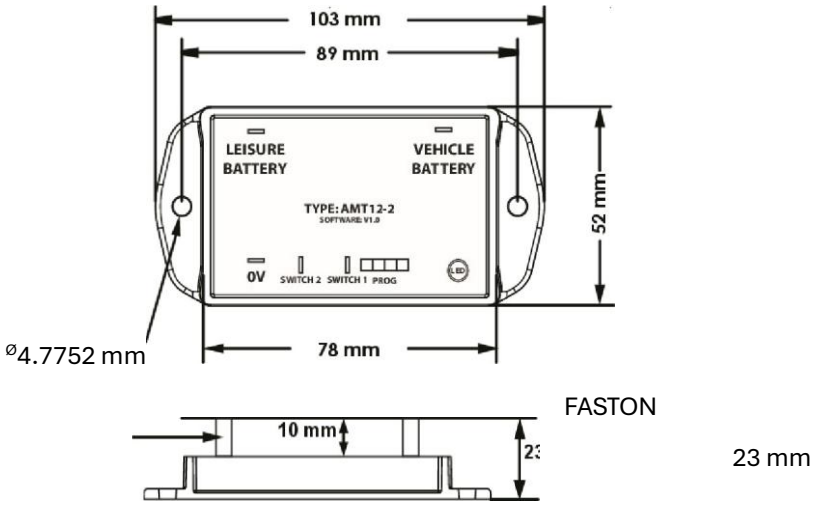
This allows available charge to be shared between the two batteries, helping maintain their state of charge and supporting battery longevity.

Vehicle Battery Low-Voltage Protection

To protect the vehicle battery, the AMT 12-2 will not supply charging current if the vehicle battery voltage falls below 11.5V. This prevents the unit from attempting to charge a deeply discharged vehicle battery.

The unit is shipped configured for a Smart Alternator Vehicle & Regenerative Braking ie SETTING 4 in the table below, but it is easily configured by the user with higher settings for older Vehicles. The customer can configure for use with Lithium Batteries. The unit is also configured to automatically detect Battery Voltage & so will work with 24V Batteries.

Mechanical: This unit should be mounted subject to the drawing below.

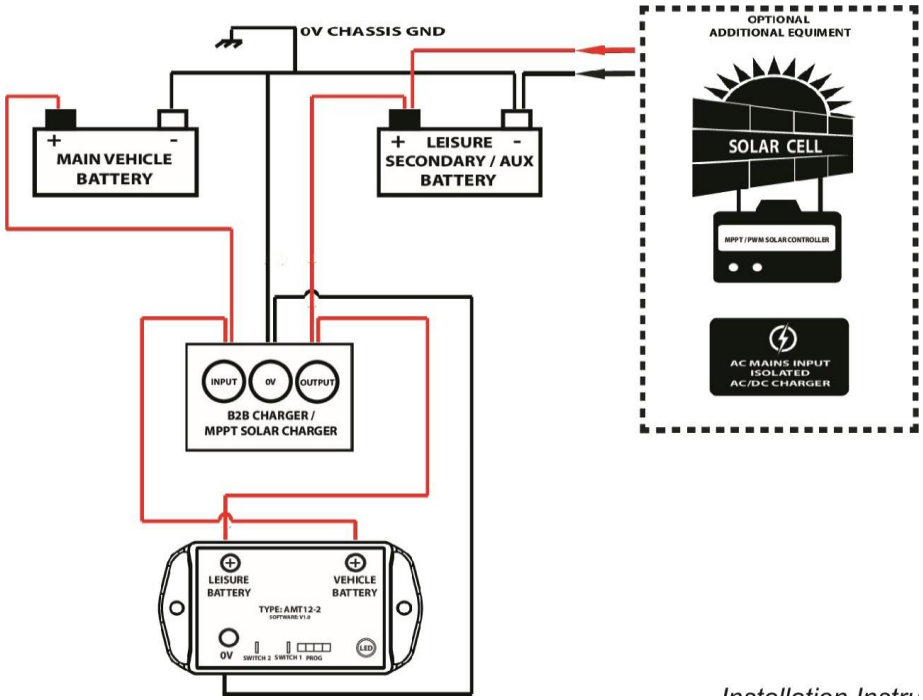


Electrical:

INSTALLATION WIRING GUIDE:

ENSURE MAIN VEHICLE INPUT SUPPLY & BATTERY OUTPUT CABLES CONNECT TO THE B2B CHARGER NOT AMTI 2- UNIT.

* MINIMUM CABLE SIZE: 1.5MM SQ * BETWEEN AMTI 2-2 & B2B CHARGER MPPT SOLAR CHARGER



1. Power-Up and Connection Procedure

To ensure the unit operates correctly, follow this connection sequence:

1. Connect the positive (+) and negative (−) inputs from both the leisure battery and the vehicle battery.
2. Ensure all battery connections have the correct polarity.
3. Only after these connections are complete should a signal or power supply be applied to terminal switch SW1.

Important: If SW1 is activated before both battery inputs are connected, the unit will flash GREEN for one minute.

2. Terminal Switch Functions

- **SW1 – Programming and Disable:** Used to select the operating settings and disable the trickle charger. Applying an ignition signal to SW1 disables charging.
- **SW2 – Override ON:** Used to activate the trickle charger temporarily, allowing manual charging or control through external equipment.

3. Programming the Unit

Follow these steps carefully to select an operating setting. Setting 4 is the default setting.

Step 1 – Disconnect the power

Disconnect all power supplies to the unit.

Step 2 – Connect SW1

Connect SW1 to the positive (+) terminal of the leisure battery. Connect the 0 V (negative) terminal of the battery to the AMT 12-2 0 V terminal.

Step 3 – Apply power

Connect the leisure battery's +12 V supply to power the unit.

The LED will flash a number of times in sequence starting at 1 flash to 8 flashes to indicate the currently selected setting.

Step 4 – Select the required setting

1. Remove the wire connected to SW1 and reconnect the wire within 40 seconds.
2. The LED will cycle through the available settings, in sequence starting at 1 flash to 8 flashes.
3. When the Sequence matches the setting required, remove the +12 V connection from SW1.

Step 5 – Save the setting

Reapply +12 V to SW1. The LED will flash rapidly while the unit learns the selected programme.

Step 6 – Check the selected setting

1. Remove the wire from SW1.
2. Wait approximately one second, then reconnect it.
3. Observe the LED sequence to confirm the selected setting.

If the setting is incorrect, disconnect the 12 V supply and restart the procedure from Step 1.

If the setting is correct remove the wire from SW1.

4. Operating Settings

The AMT 12-2 has eight settings. Settings 5–8 are high-power versions of settings 1–4 and are intended for applications with higher parasitic battery drain.

Settings 1–4 are suitable for most applications.

Settings 5-8 are for higher parasitic drain.

Setting	Alternator type	Leisure battery must exceed	Vehicle battery threshold	Battery type
1 & 5	Standard alternator / ignition	13.0 V	12.8 V	All lead-acid battery types
2 & 6	Standard alternator / ignition	13.5 V	12.8 V	Lithium
3 & 7	Smart alternator	13.5 V	12.4 V	Lithium
4 & 8	Smart alternator	13.0 V	12.4 V	All lead-acid battery types

Factory default: Setting 4.

Choose a setting that matches your alternator type and leisure battery chemistry. If your vehicle has a smart alternator, use a smart-alternator setting.

5. Normal Operating Behaviour

Vehicle battery voltage below 11.5 V

All settings stop charging when the vehicle battery voltage falls below 11.5 V.

If the leisure battery is above its selected voltage threshold while the vehicle battery is below 11.5 V, the LED flashes RED to indicate the low vehicle battery voltage.

Vehicle battery voltage between 11.5 V and its selected threshold

When the leisure battery voltage is above its selected threshold and the vehicle battery voltage is between 11.5 V and its selected threshold, the unit supplies charging current to the vehicle battery.

- The unit supplies up to 3 A in short bursts.
- The LED illuminates GREEN while this charging current is flowing.
- The stated charging cycle is approximately bursts or 6 seconds (settings 1-4) or 10 seconds (settings 5-8) ON and 15 seconds OFF.

Vehicle battery voltage above its selected threshold

When the leisure battery voltage is above its selected threshold and the vehicle battery voltage is also above its selected threshold, the LED flashes AMBER approximately once every 10 seconds.

This indicates that the charging circuit is enabled and the vehicle battery voltage is high enough to meet the selected threshold.

If the Leisure Battery is above the Leisure Battery threshold and the Vehicle Battery is below 1 1.5V, AMT12-2 will flash RED.

6. Ignition and Override Functions

Ignition input – SW1

Applying an ignition signal to SW1 disables the trickle charger.

Override input – SW2

Applying a signal to SW2 activates the trickle charger in a repeating cycle:

- ON for approximately 9 seconds.
- OFF for approximately 1 second.

This function allows the charger to be controlled manually or by external equipment.

It can also be used to provide manual charging to the vehicle battery.

Warning: Using the override function may discharge either the leisure battery or the vehicle battery. Monitor battery voltages when using this function.

The LED will illuminate AMBER during override operation.

7. Troubleshooting

If the unit does not operate as expected, check the following.

Battery connections

- Check the positive (+) and negative (−) connections at both battery inputs.
- Confirm that the polarity is correct.
- Measure the voltage at both battery inputs.
- Confirm that the voltages meet the thresholds for the selected setting.

Leisure battery voltage is above its threshold

If the leisure battery voltage is above its selected threshold and the vehicle battery voltage is above its selected threshold, the LED should flash AMBER approximately once every 10 seconds.

Vehicle battery voltage is below 11.5 V

If the leisure battery voltage is above its selected threshold and the vehicle battery voltage is below 11.5 V, the LED should flash RED.

Vehicle battery voltage is between 11.5 V and its selected threshold

If the leisure battery voltage is above its selected threshold and the vehicle battery voltage is between 11.5 V and its selected threshold, the LED should illuminate GREEN while charging current flows, approximately 3-second bursts every 15 seconds.

If the LED behaviour does not match these conditions, recheck the wiring, battery voltages, selected setting and SW1/SW2 input signals.

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8. Important Notes

- Connect both battery inputs before applying a signal to SW1.
- Always verify the selected programme after programming.
- Select the setting appropriate for the alternator and battery type.
- Settings 5–8 provide higher-power operation for applications with greater parasitic drain.
- The charger will stop operating if the vehicle battery voltage falls below 11.5 V.



If you require any assistance or advice on this product. Please contact Sunshine Solar Ltd Technical on +44(0)1508 488188.