



Installation and Operating instructions

a-Tronix

MPPT solar charge controller X45/10



model	item number
a-Tronix MPPT solar charge controller X45/10	9887579

INTRODUCTION

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Thank you

for purchasing the a-TroniX series MPPT solar charge controller X45/10

The solar charge controller is based on advanced MPPT technology specially developed for solar systems.

It is used to determine the optimal operating point for the maximum output of the solar module, which is made up of the voltage and the current.

You can thus achieve the highest battery charging efficiency. Due to a precise temperature sensor, the battery life is extended.

Read carefully before use!

Read this user manual carefully before installation.

It contains important regulations and notes for the use of this product and provides technical support for the operator of the device.

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We assume no liability for errors in this manual and the resulting consequences.

The information in this document is subject to change without prior notice, but there is no obligation to keep it up to date.

We reserve the right to make design and device changes that serve to improve the production process or the product.

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1. Symbols and abbreviations used

In this manual, the abbreviation **MPPT** stands for: Maximum Power Point Tracking.

Solar charge controllers are used in conjunction with a photovoltaic system. These are also referred to as **PV** systems.

Accumulators are usually used as energy stores in a PV system . These are colloquially referred to as **rechargeable batteries** or batteries.

Warnings and notes are identified by the appropriate symbols (pictograms) and must be observed, otherwise they will be lost
Injury or death can result:

WARNING!



Danger high voltage.



General warning of danger spots.



Warning when handling accumulators.

NOTE:



This symbol indicates text, hints or tips.

Failure to take preventive protective measures may result in damage to the product and/or its functions or something in its vicinity.

ENVIRONMENT:



Indicates information about recycling.



Identifies assemblies or parts that must be disposed of properly. Do **not** throw them in the household waste.

Make use of the certified and professional recycling service of our AKKU SYS team.

For more information contact us by phone

on the hotline +49 4101/376760, info@akkusys.de or use the QR code:



2. Important Safety Instructions

Be sure to follow all warnings and instructions in this manual.

Keep them safe and read the following notes carefully before installing and starting up the device.

The operating instructions must be read and understood by all persons and specialists who work with this device and all points must be observed.

Do not try to disassemble the device. It contains no user-serviceable parts. During installation, operation or maintenance carried out by qualified personnel, observe the local safety instructions and the relevant laws. Otherwise personal injury or equipment damage may occur.

The safety instructions in this manual serve as a supplement to the local safety instructions. Our company assumes no liability for damage caused by non-observance of the safety instructions.

This also applies if no regular maintenance or maintenance/repairs were not carried out by qualified specialist personnel. The device must also be set up by qualified specialist personnel.

The solar charge controller may only be used in photovoltaic systems that comply with these operating instructions. Likewise, only solar modules that meet the requirements of the controller may be used. No other energy sources may be connected to the solar charge controller.

Any further use or use that goes beyond this is considered **to be improper** and can lead to personal injury, damage to property and/or damage to the device.



The batteries store a large amount of energy. Therefore, be careful not to short-circuit the battery.

We recommend installing a fuse or circuit breaker on the positive (+) terminal between the battery and ESC. The fuse or switch should not be more than 15 cm from the battery post.

- Batteries can produce flammable gases (oxyhydrogen). Therefore, avoid sparks and/or flames near the battery.
- Make sure the battery is in a well-ventilated place.
- Avoid touching or shorting wires or terminals.
The voltage on wires or terminals can be many times higher than the battery voltage itself.
- Only use insulated tools.
- Keep children away from all electrical devices/connections etc.

3. function

The solar charge controllers are programmable, waterproof and well suited for a variety of solar systems.

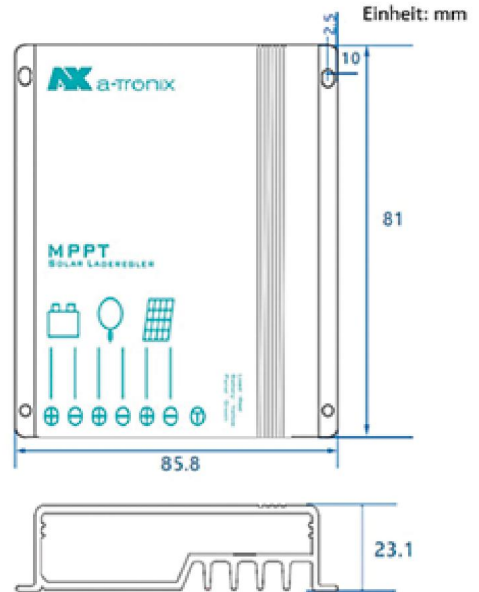
The charging efficiency is higher than that of a conventional PWM controller.

The Smart MPPT series has the following features:

- Innovative Maximum Power Point Tracking (MPPT) technology, Tracking efficiency >99.9%
- High charge conversion efficiency of up to 96.5%
- 5-level load output timer
- Very low power consumption
- Special Bluetooth chip, Bluetooth 4.2 and BLE technology
- Suitable for gel, wet, AGM and lithium batteries
- Four-stage charge: MPPT, Boost, Equalize and Float
- Day/night threshold can be adjusted automatically
- Automatic activation of the BMS when due to LVD (undervoltage lockout) has been switched off
- Protection class IP67
- Robust and durable aluminum housing
- Fully automatic electronic protection function
- 0°C charging protection (lithium)



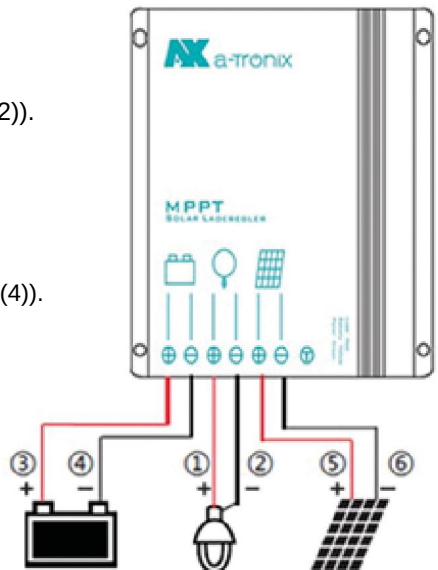
4. Dimensions



5. Installation

Make sure the cable lengths between the battery and the controller are as short as possible. Make sure that the cable cross-section is sufficient and that you connect it in the correct order:

1. First connect the load with the corresponding cables (positive pole=red (1) // negative pole=black (2)). Then isolate them with a suitable insulating tape (not included).
2. Then connect the battery. It applies again (positive pole=red (3) // negative pole=black (4)). The load should now be switched on.
3. Connect the solar panel with the positive cable (5) and the negative cable (6). The controller starts charging.
4. Check the status of the LED display (see section 10).



6. Commissioning of the controller

6.1 Self-Test

As soon as the charge controller draws power for the first time, it starts a self-test. It then automatically switches to normal operation.

6.2 System Voltage

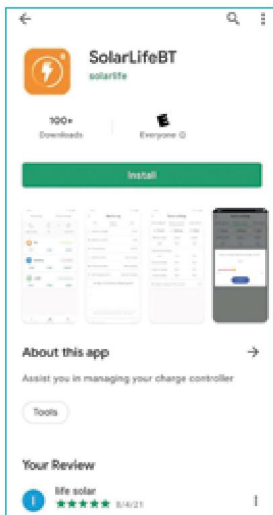
The charge controller can be used for lithium, gel, AGM and wet batteries. The default is Gel. Therefore, please make absolutely sure that the charge controller is set appropriately for your battery. If the setting does not match the characteristic of the battery, change it accordingly.

If the controller is set to gel, wet, AGM or lithium battery and the battery voltage is 10-15V when switched on, the charge controller will set a 12V system. If the battery voltage is not between 10-15 V, please read point 11. (Troubleshooting).

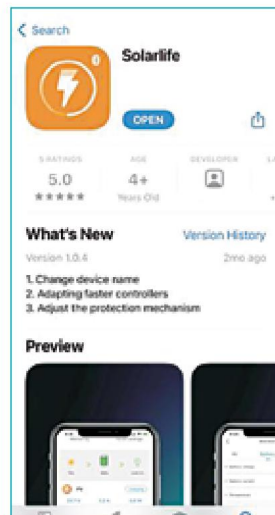
7. Installation of the App

To install the app, search for "solarlifeBT" in your Playstore (Android phone) and "solarlife" in the App Store (iOS). For detailed explanations and settings, please read the user manual of the Bluetooth app.

Android



Apple



8. Bluetooth

The controller has a Bluetooth communication function. After successfully installing the app, the controller can be connected to the mobile phone via Bluetooth.

For detailed instructions, please read the instructions in the Bluetooth app. With the help of the app, you can set the parameters, including the devices and battery parameters. The operating status of the control unit is also displayed in real time.

8.1 Charging voltage wet, gel, AGM battery

With the charging voltages wet, gel or AGM battery, you must set the parameters for boost, equalization and float voltage via the app.

The following voltage parameters apply to 25°C/12V systems:

charge level	area of charging voltage	default charging voltage
boost	14.0-14.8V	14.5V
equalizing charge	14.0-15.0V	14.8V
float voltage	13.0-14.5V	13.7V

8.2 Lithium charging voltage



You can set the overcharge protection and overcharge recovery voltage of the lithium battery through the app. Overcharge Protection (CVT): 10.0-17.0V Overcharge Recovery Voltage (CVR): 9.0-16.8V



Overcharge Recovery Voltage + 1.5V > Lithium
Overcharge Protection Voltage > Overcharge Recovery Voltage + 0.2V.
If the deviation is greater than 0.2V, the manufacturer assumes no liability for a system malfunction caused by this.

8.3 Under Voltage Lockout (LVD)

To prevent deep discharge of the load, the controller turns off the load as soon as the battery voltage falls below the LVD voltage. Should this happen, the battery must be fully charged before using it again.

1. Lithium batteries: LVD=9.0-15.0V (default: 9.0V)

2. Gel, wet and AGM batteries:

The low voltage protection of the controller can be divided into two types: a. Battery voltage control:

Low voltage cut-off adjustment range: 10.8-11.8V (default: 11.2V) b. Battery capacity control:

Setting range of undervoltage shutdown: SoC 1 – SoC 5

SoC	status
SoC 1	11.0 - 11.6V
SoC 2	11.1-11.7V
SoC 3	11.2 - 11.8V
SoC 4	11.4-11.9V
SoC 5	11.6 - 12.0V

8.4 Low Voltage Reclosing (LVR)

If the undervoltage lockout is triggered, the controller will not reestablish the charge connection until the battery voltage is above the LVR voltage.

1. Lithium batteries: LVR= 9.6 to 16.0 V 2.

Gel, wet and AGM batteries: LVR= 11.4 to 12.8 V

- The LVR should be higher than the LVD.
- The LVD should be at least 0.6V.
- If you want to change the LVD, you must first change the LVR.

8.50°C Charge (Lithium)

The 0°C charge can be set to "Yes", "No", or "Slow".

If the temperatures are higher than 0°C, the normal charging mode is used. However, when temperatures are below 0°C, the following applies:

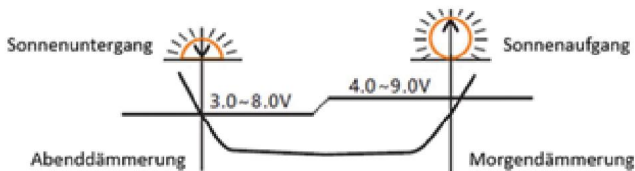
charge mode	charge
Yes	Battery can be charged normally
Slow	Max. charging current is 20% of the rated current
no	Battery cannot be charged

8.6 Day/Night Threshold and day/night delay

Based on the open-circuit voltage of the solar system, the charge controller recognizes day and night. The day/night threshold can be adjusted depending on the lighting conditions.

Threshold setting range: 3.0 to 8.0 V.

The threshold can be delayed by up to 30 minutes using the day/night delay.



The load shedding threshold voltage is 1V higher than the setting data.

This means that the load will be cut off when the solar voltage is between 4.0V to 9.0V.

The controller automatically adjusts the threshold voltage.

On the first night, the load will have no power. 24 hours later, the controller automatically adjusts the setting to deliver power the following night.

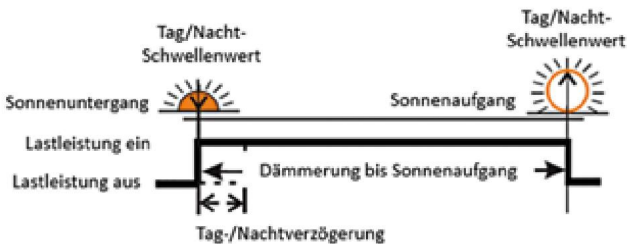
9. Charge Modes

9.1 Mode: Always on



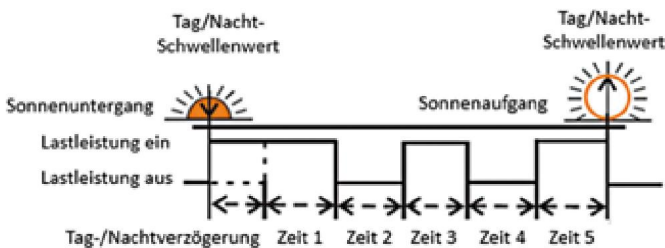
When setting the load mode to "always on", the load is always on unless the protection state is present.

9.2 Mode: Dusk to Sunrise



With this charging mode, the day/night threshold values and the day/night delay can be set. The load can be switched on or off by the test function during the day during the charging process.

9.3 5-level mode



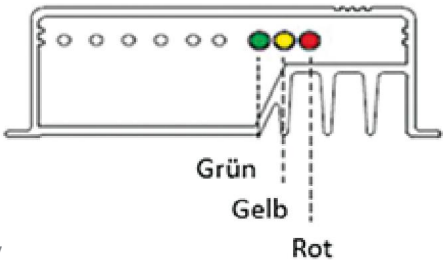
Times 1-5 can be set individually to allow variable load performance at night. if e.g. B. Time 4 is set to "TOT" (Time/Operation/Time), time 4 is removed. The system then takes at time 4 the data from time 5 and previous data about the time of sunrise.

If the controller turns off the load due to under-voltage protection, over-current protection, short-circuit protection or over-temperature protection, the load will automatically turn on again when the charge controller exits the protection state.

9.4 Manual operation

If the load mode is set to manual, you can turn on/off the load output manually via the Bluetooth app.

10. LED indicator



10.1 Explanation of LED display

LEDs	status	function
Green LED On		The solar module is correctly connected but not charged
	Flashing (0.1 / 0.1s)	MPPT loading
	Flashing (0.5 / 0.5s)	Equal or reinforced charge (Gel, wet or AGM battery)
	Slow blinking (0.5/2s) Charging	
Yellow LED Off		Overvoltage protection
	On	battery is normal
	Flashing slowly (0.5 / 2 s)	Battery voltage is too low
	Fast flashing (0.1 / 0.1s)	low voltage protection
Red LED Off		Works normally
	On	The output power is 0.
	Flashing (0.5/2s)	over temperature
	Fast flashing (0.1 / 0.1s)	Short circuit or over current protection



11.Troubleshooting

mistake	status	cause	remedy
Charges are not powered	low voltage protection	The battery capacity is low.	Charge battery via LVR.
	overcurrent or load short circuit	Overload or load short circuit.	Switch off all consumers, eliminate the short circuit, reconnect the load after 1 minute.
	over-temperature protection	Control temperature is too high.	The controller turns off the system until the temperature falls below 60°C.
Height tension at the battery pole	Overvoltage protection	battery over voltage >15.5V (Li: CVT +0.2V)	Check if other sources are overcharging the battery. If not, the controller is probably damaged.
		The battery line or battery fuse is damaged, the battery has high resistance.	Check battery performance and battery fuse.
false system voltage	ALL LEDs flash quickly	The battery voltage is not in the correct range.	Discharge and charge the battery to correct the voltage.
Battery is after a short time empty	Lower voltage protection	The battery has insufficient capacity.	Replace the battery.
Battery not charging	Green LED does not light up.	PV panel fault or the pole connections are reversed.	Check the panels and cables links.



12. Security Features

mistake	status	cause	remedy
	Protected *1	Protected	Protected *1
short circuit	Protected	Protected *2	Turns off immediately
overcurrent	—	—	Switches off with a delay
countercurrent	Protected	—	—
Overvoltage Max. 45V		Max. 25V	—
undervoltage	—	—	Switch off
Overtemperature	The controller cuts off the load when the temperature reaches the set value.		

*1 Controller can protect itself, but the load might be damaged.

*2 The battery must be protected by a fuse.



ATTENTION:

The combination of different error states can lead to damage to the controller. Always troubleshoot first before reconnecting the controller.

13. Specifications

a-TronIX MPPT solar charge controller X45/10		Item No. 9887579
battery parameters		
Max charge current		10A
Mains voltage		12V
Max. voltage at battery terminal		25V
Battery type		Lithium, Wet, Gel, AGM (Default: Gel)
Wet, gel and AGM	MPPT charge voltage	<14.5V 25
	Voltage boost	14.0-14.8V (programmable, default: 14.5V@25°C)
	Equalize voltage	14.0-14.8V (programmable, default: 14.8V@25°C)
	Float Voltage Low.	13.0-14.5V (programmable, default: 13.7V@25°C)
	Disconnect Power on again	10.8-11.8V, SOC1-5 (programmable, default: 12V)
		11.4~12.8V (programmable, default: 12V)
Temperature compensation		15.5V
		-4.17mV/K per cell (boost, equalization), -3.33mV/K per cell (float)

operation manual

MPPT solar charge controller X45/10



a-TronIX MPPT solar charge controller X45/10		Item No. 9887579
battery parameters		
lithium	Charging voltage	10.0–17.0V (programmable)
	Restore charge voltage	10.0–17.0V (programmable)
	lithium low voltage	9.0–15.0V (programmable)
	Turn on low voltage again	9.6–16.0V (programmable)
	Load protection	Yes, No, Slow (Lithium, Default: Yes) 0°C
panel parameters		
Maximum input power		130W
Maximum voltage at the PV connection		45V
Dusk/twilight detection in V		3.0–8.0V (default: 5.0V)
Day/Night Delay Time		0-30 min (programmable, default: 0 min)
MPPT tracking area		(battery voltage +1.0V) -Voc*0.9 *1
Maximum tracking efficiency		>99.9%
Load		
working mode		Always on, Dusk, Five levels, Manual (Default: Always On)
output current		10A
system parameters		
Maximum charge conversion		96.50%
communication distance		10m
ownconsumption		8mA
size		85.8*81*23.1mm
Weight		260g -35~+60°C
ambient temperature		
ambient humidity		0-100%RH
degree of protection		IP67
Maximum height		4,000m

*1 The VOC of the solar panel must not exceed this value, otherwise the controller will be damaged.

*2 VOC is the open circuit voltage of the solar panel.



If you have any questions, please do not hesitate to contact us!

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