MPPT- Solar charge controller SMR250dt

Description:

This charger is designed for the use in **solar light systems**. For this purpose a **dawn switch** and timer is integrated. The consumer output (load) will be activated as soon as the solar modul voltage rises above 10V. The **two fold timer**, can be adjusted for evening operation between 1 and 7 hours and is fixed for morning operation at 2 hours. It controlls the consumer output. The load is switched on during night for the endurance of the timer adjustment. For **test** purpose the load can be continuously (day and night) switched on. The deep discharge disconnect will stay active. At the right end stop of the blue poti the timer is unlimited.

This charger is in digital technique. It contains all functions for smooth charging of lead batterys by solar modules of 300Wp at 24V- and 150Wp at 12V-Systems.
Because of the powertracking it is possible to increase the electrical power of a solar system up to 40%, than standart charger can do.
The maximum solar voltage can be for a 12V-system as well as for a 24V-system at 100V. (Open circuit voltage)
This buck converter feeds the maximum possible current from the power maximum into the battery. As soon as the battery is full and reaches its maximum voltage (14.5V/29.0V) the charger drives the solar voltage towards open circuit voltage, preventing overcharging of the battery. A yellow LED indicates this state of charge.
Deep discharge protection is activatet with 8 Seconds delay. Switching is done by a Power Mosfet on the ground level. Indication of consumer switch off by a red LED.
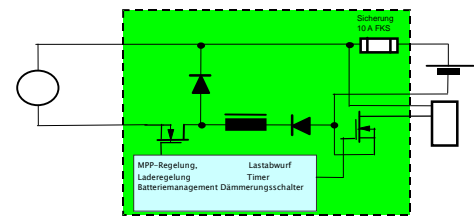The green LED indicates solar voltage.
A temperature sensor tracks the maximum battery voltage at - 4mV/°C/batterycell.

The MPP-control is activated all 8 Seconds to regain the optimum powerpoint of the solar module.
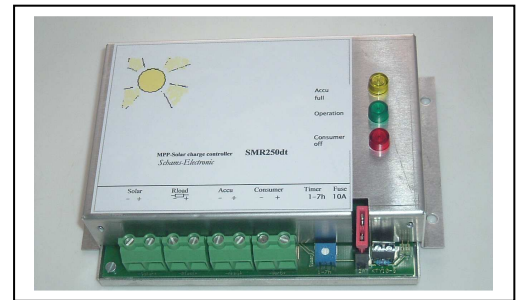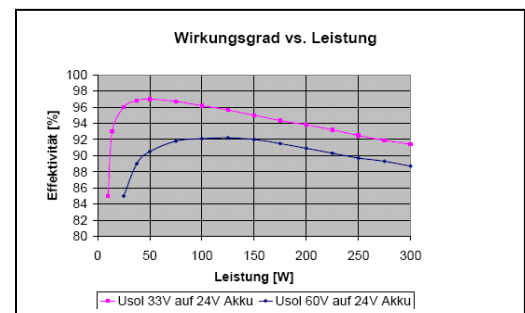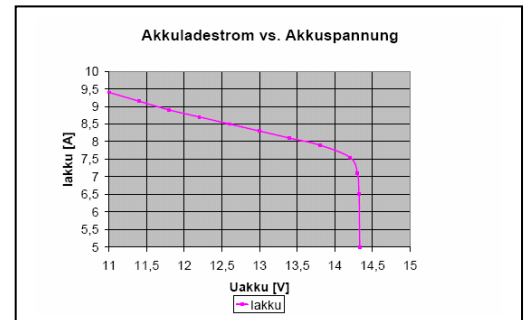

Principal circuit diagramm

Highlights:
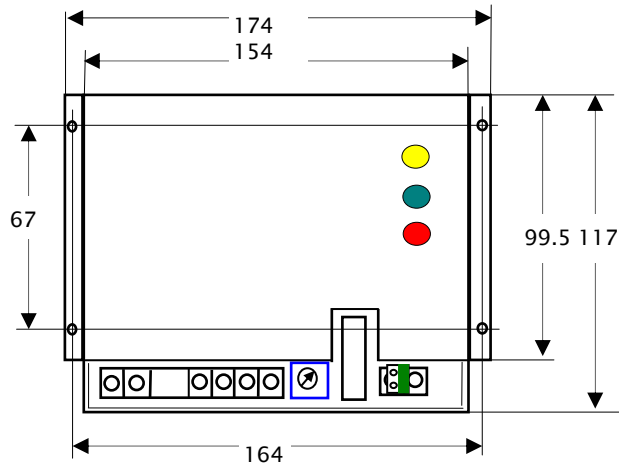* DC-Converter to optimize solar power income
* MPP-Tracking of solar voltage
* Selection of 2 battery voltages 12V/24V
* Indication of state of charge per LED
* Deep discharge protection
* Temperature tracking of battery voltage
* Morning timer and adjustable evening timer,
* dawn switch
* Overtemperature protection of power

Technical Specifications

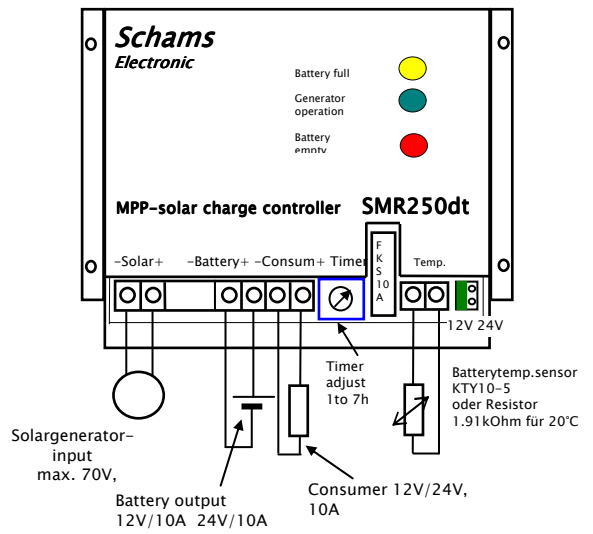|	**12V-Battery**	**24V-Battery**
Max. Solarmodul voltage Usoc	100V	100V
Max. Solar current	10A	10A
Max. battery current	10A	10A
Max. Solar power, Pnom	150Wp	300Wp
Effectivity	Ca. 90% at half load	Ca. 92% at half load
Max. Batteryvoltage	14.5V	29.0V
Deep discharge protection Load cast off Load reconnect	At 10.8V At 12.5V with 8 sec. delay	At 21.6V At 25.0V with 8 sec. delay
Current consumption	1.5mA	2.5mA
Terminals: 2x Solar modul 2x Battery 2x consumer 2x temperature sensor	4sqmm/2.5sqmm, 4sqmm/2.5sqmm 4sqmm/2,5sqmm 1.5sqmm	
Temperature sensor	KTY10-5 or 1.91kOhm	
LEDs	top: yellow (max. batteryvoltage) middle: green (Generator voltage >Battery voltage) bottom: red (consumer off)	
housing	Aluminium BxHxT 174x37x117mm	
protection	IP40	
weight	500g	
moisture	90%	

Technical data are subject to change

Housing dimensions:

174
154
67
99.5 117
164

height=37mm, d(fixing drills)=5mm

Connection diagram:

Schams
Electronic

Battery full
Generator operation
Battery empty

MPP-solar charge controller   SMR250dt

−Solar+   −Battery+ −Consum+ Timer   F K S 10 A   Temp.

12V 24V

Timer adjust 1to 7h

Batterytemp.sensor KTY10-5 oder Resistor 1.91kOhm für 20°C

Solargenerator-input max. 70V,

Battery output 12V/10A 24V/10A

Consumer 12V/24V, 10A

Timer Poti Adjustment:

In Position "**Test**" the consumer output is active day and night. The deep discharge protection is still active. Otherwise the consumer output is on **1−7h during night**, depending on the adjustment. At the right end stop the timer is unlimited. The consumer is on during night
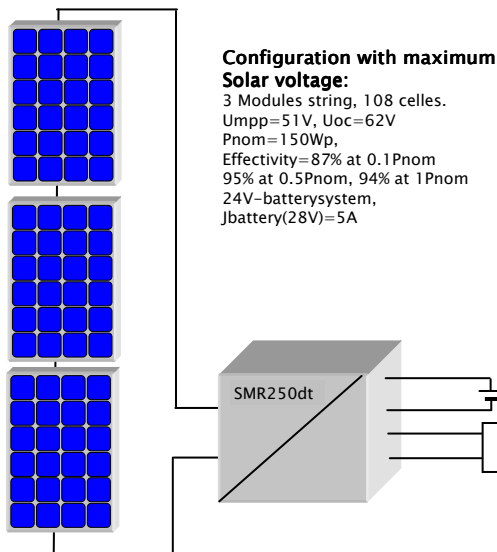


4h
3h   5h
2h   6h
1h   7h
Test   ∞h
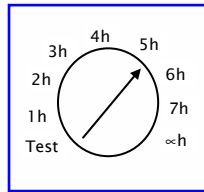
Explanation of terms:

Usoc= Open circuit voltage of solar modul
Pnom= Solar modul power at 25°C and 1000W/sqm
Umpp= Solar voltage in its optimal power point

0.1Pnom= 0.1*Pnom

Application hints:

Configuration with maximum Solar voltage:
3 Modules string, 108 celles.
Umpp=51V, Uoc=62V
Pnom=150Wp,
Effectivity=87% at 0.1Pnom
95% at 0.5Pnom, 94% at 1Pnom
24V−batterysystem,
Jbattery(28V)=5A

SMR250dt
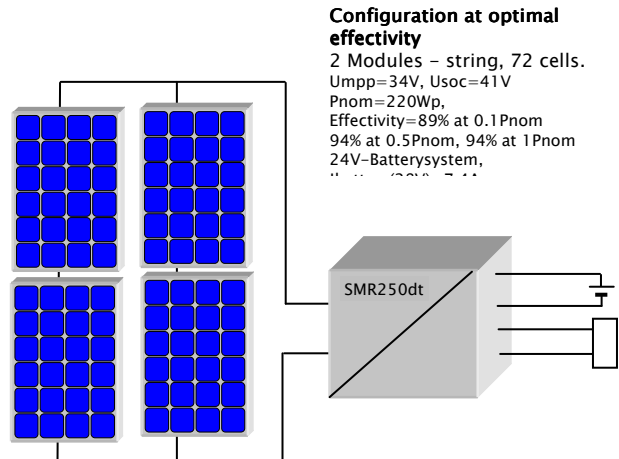
Configuration at optimal effectivity
2 Modules − string, 72 cells.
Umpp=34V, Usoc=41V
Pnom=220Wp,
Effectivity=89% at 0.1Pnom
94% at 0.5Pnom, 94% at 1Pnom
24V−Batterysystem,

SMR250dt

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