MPPT- Solar charge controller SMR2500

Description:

This charger in processor technique contains all functions for smooth charging of lead Batteries by solar modules of 3000Wp at 24V- and 1600Wp 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 and 48V-System 200V. (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/58.0V) the charger drives the solar voltage towards open circuit voltage, preventing overcharging of the Battery.

Deep discharge protection is activatet with 60 Seconds delay. Switch off is done by a Power Mosfet on the ground level. Indication of consumer switch off, by a red LED. Yellow LED on shows battery full. The green LED indicates solar current.

A temperature sensor tracks the maximum Battery voltage at -4mV/°C/Battery cell.

The powertracking system is utilized every 8 seconds to optimize the solar power point.
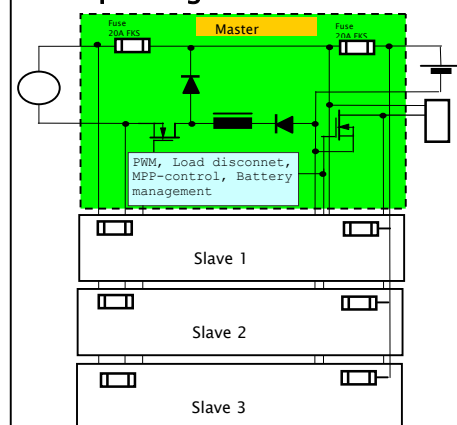
A battery management system allows adaptation to different battery types and optimal use of the battery capacity, including automatic and manual equalization controll.

Optionally a LCD, can be added, displaying Battery voltage, Battery current and ampere hours.

Optionally a RS232 can be added.

Highlights:
* DC-Converter to adapt battery to solar voltage
* MPP-Tracking of solar power
* Selection of 3 Battery voltages 12V/24V/48V
* Deep discharge protection short cut protected
* Option: Temperature tracking of Battery voltage
* Option: LCD for Battery voltage, - current, power and energy (kilowatt hour meter).

Principal diagramm:

Technical data:

	12V-Akku	24V-Akku	48V-Akku
Max. solar open circuit voltage, Usoc	200V	200V	200V
Max. solar current	108A	104A	65A
Max. charge current	100A	100A	62.5A
Max. solar power, Pnom	1559Wp	3021Wp	3776Wp
Efficiency	Ca. 93% bei Halblast	Ca. 96% bei Halblast	Ca. 96% bei Halblast
Deep discharge protection Load disconnect (short cut protected)	10.8V Battery voltage with 60 Sec. Delay	21.6V Battery voltage with 60 Sec. delay	43.2V Battery voltage with 60 Sec. delay
Load reconnect	12.5V	25.0V	50.0V
Max. consumer current	62.5A	62.5A	62.5A
End of charge voltage	14.5V	29.0V	58V
Current consumption	19mA	19mA	19mA
Terminals 3x solargenerator 2x battery output 2x consumer outp. 2x temp. sensor 2x pot.free contacts 1x Earth	35qmm/25qmm, 35qmm/25qmm, 35qmm/25qmm, 1qmm, 1qmm, M6		
Temperatur sensor	KTY10-5 or 1.91kOhm		
Cable glands	3x PG16, 2x PG7		
LED's	yellow (Indication of max Battery voltage) green (Battery current>0.5A) red (consumer off)		
housing	Steel wall mounted wxhxd 300x500x210mm		
protection	IP54		
weight	16kg		
Moisture	90% (coating)		
Operating Temperature	-20°C to +50°C		

Battery current via battery voltage

Efficiency via power

— Usol 33V on 24V Battery   — Usol 82V on 24V Battery
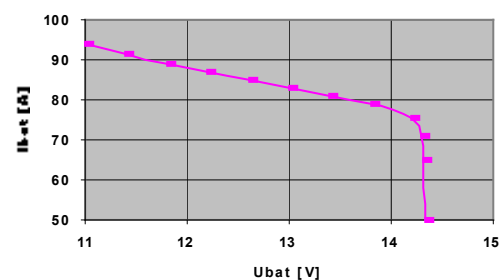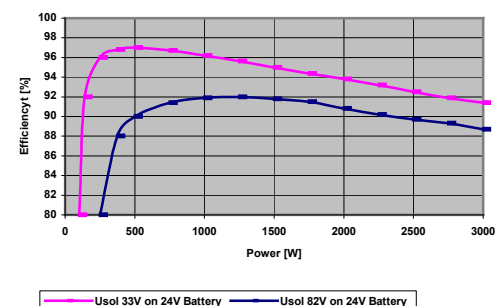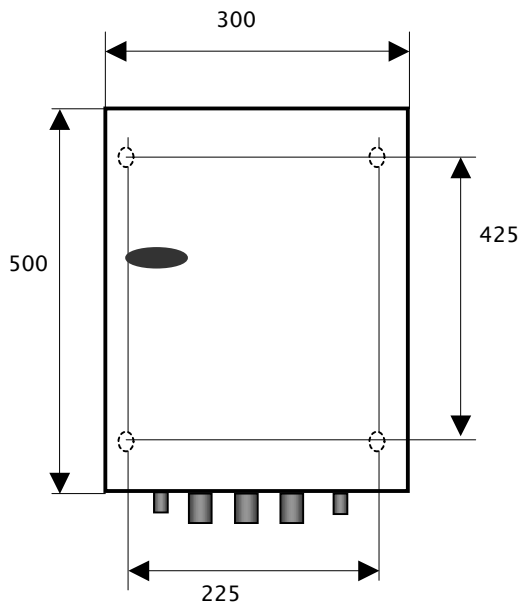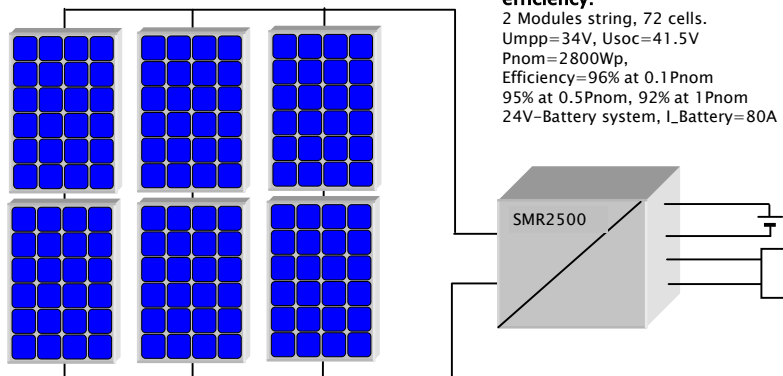
Technical data are subject to change

Housing dimensions (mm):

300

425
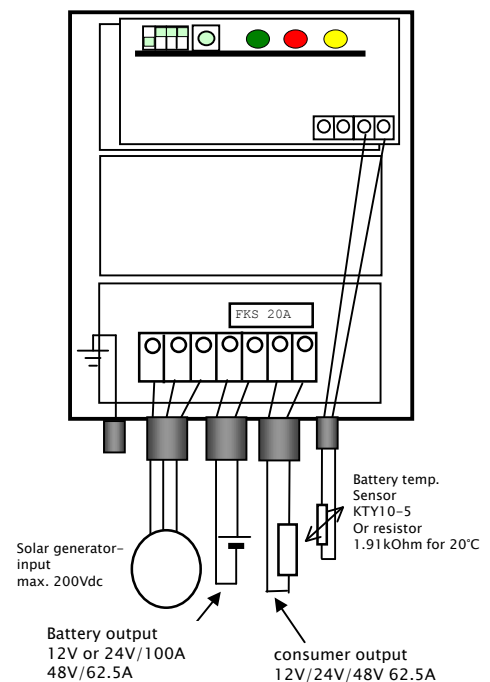
500

225

Height=210mm
Mounting holes in bottom of housing
D=10mm

Connection diagram

FKS 20A

Battery temp.
Sensor
KTY10-5
Or resistor
1.91kOhm for 20°C

Solar generator–
input
max. 200Vdc

Battery output
12V or 24V/100A
48V/62.5A

consumer output
12V/24V/48V 62.5A

Applications:

Configuration with optimum efficiency:
2 Modules string, 72 cells.
Umpp=34V, Usoc=41.5V
Pnom=2800Wp,
Efficiency=96% at 0.1Pnom
95% at 0.5Pnom, 92% at 1Pnom
24V–Battery system, I_Battery=80A

SMR2500

Dil switches on controll board

MPP and deep discharge protection

MPP contr. off,
10s delay off

MPP contr. on,
10s delay on

12V   ON   1   2   3   4

24V   ON

48V   ON

SMR2500

Configuration with maximum Solarvoltage:
6 Modules string, 216 Cells.
Umpp=102V, Usoc=124V
Pnom=2800Wp,
Efficiency=81% at 0.1Pnom
91% at 0.5Pnom, 89% at 1Pnom
24V–Battery system,
I_Battery=80A

Technical data are subject to change

4 Strings parallel with 4 solar modules per string to one SMR2500.
for instance "JVP250 Desert", 250Wp, 8.3A, Vmpp=120.5V, V(80°C)=90V

SMR2500

SMR2500 with 48V battery system
Imax=75A

SMR2500

SMR2500 with 48V battery system
Imax=75A

48V
Battery bank

SMR2500

SMR2500 with 48V battery system
Imax=75A

SMR2500

SMR2500 with 48V battery system
Imax=75A
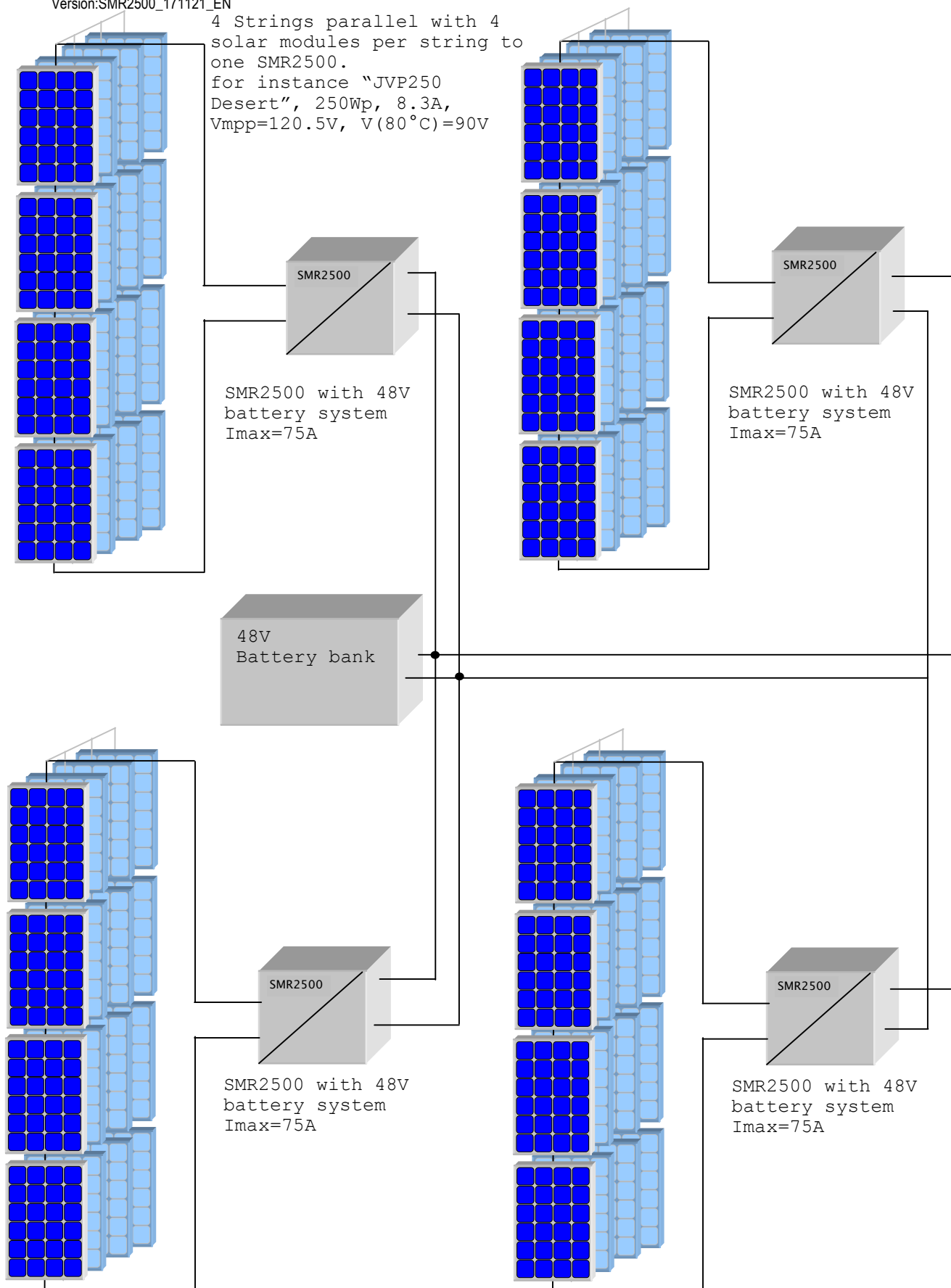
**Total solarpower 16kWp. Total battery charging current 300A.
Battery system voltage 48V.**

Technical data are subject to change

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