MPPT- Solar Charge Controller SMR1000
Description:

This charger in processor technique contains all functions for smooth charging of lead Batteries by solar modules of 1200Wp at 24V- and 620Wp 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.
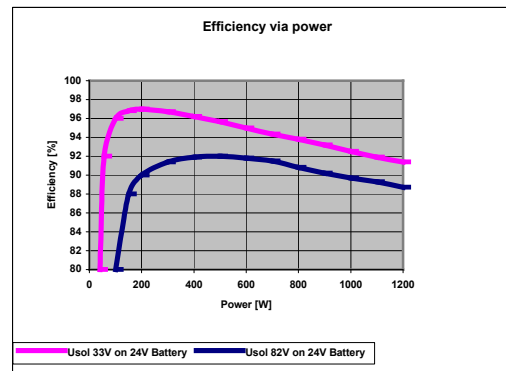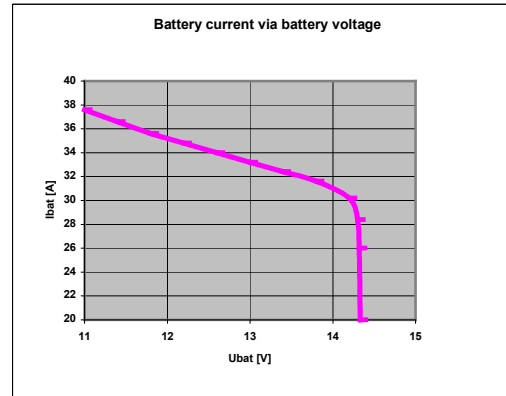

Principal circuit diagram
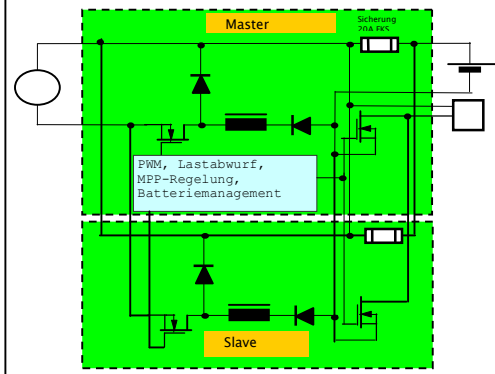
Highlights:
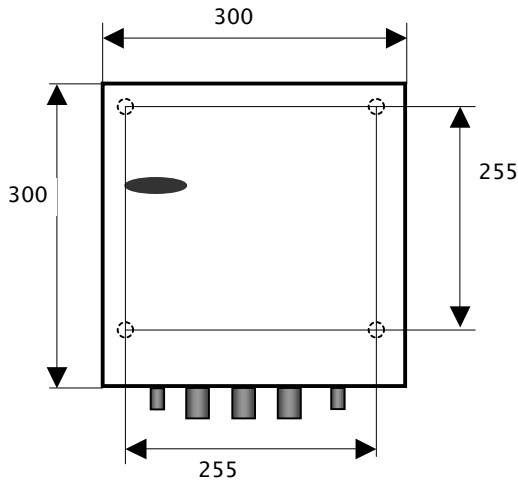* DC-Converter to adapt battery to solar voltage
* MPP-Tracking of solar power
* Selection of 3 Battery voltages 12V/24V/48V
* Deep discharge protection short cut protected
* Option: Temperature tracking of Battery voltage
* Option: LCD for Battery voltage, -current, power and energy (kilowatt hour meter).

Technical data:

	12V-Battery	24V-Battery	48V-Battery
Max. solar open circuit voltage, Usoc	200V	200V	200V
Max. solar current	43A	42A	26A
Max. charge current	40A	40A	25A
Max. solar power, Pnom	624Wp	1208Wp	1510Wp
Efficiency	Ca. 93% @ 0.5Pnom	Ca. 96%@ 0.5Pnom	Ca. 96% @ 0.5Pnom
End of charge voltage	14.5V	29.0V	58V
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	25A	25A	25A
Current consumption	10mA	10mA	10mA
Terminals 3x solargenerator 2x battery output 2x consumer outp. 2x temp. sensor 2x pot.free contacts 1x Earth	16qmm/10qmm, 16qmm/10qmm, 16qmm/10qmm, 1qmm, 1qmm, M6		
Temperatur sensor	KTY10-5 or 1.91kOhm		
Cable glands	3xPG16, 2xPG7		
LED's	right: yellow (Indication of max Battery voltage) left: green (Battery current>0.5A) middle: red (consumer off)		
housing	Steel wall mounted wxhxd 300x300x150mm		
protection	IP65		
weight	11kg		
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:

300

300

255

255
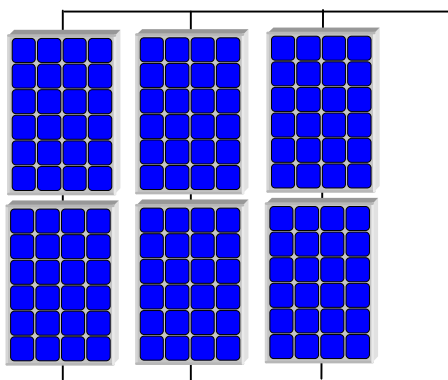
Height=150mm
  Mounting holes in bottom of housing
  D=10mm

Connection diagram

FKS 20A

Battery temp.Sensor
KTY10-5
or resistor
1.91kOhm für 20℃

Solargenerator
Input
max. 200V

Battery output
12V oder 24V/40A
48V/25A

Consumer output
12V/24V/48V, 25A
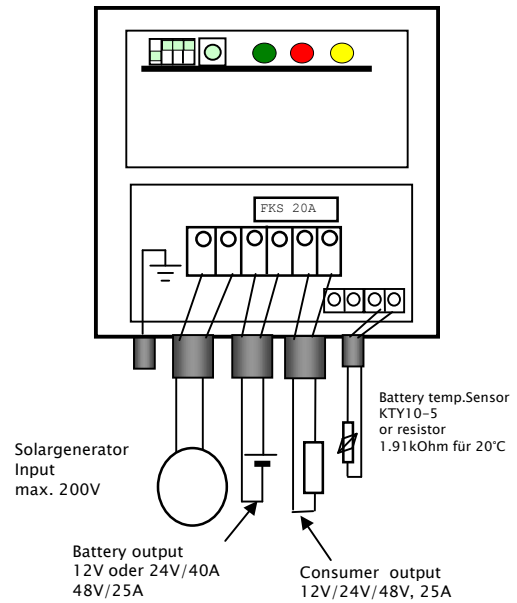
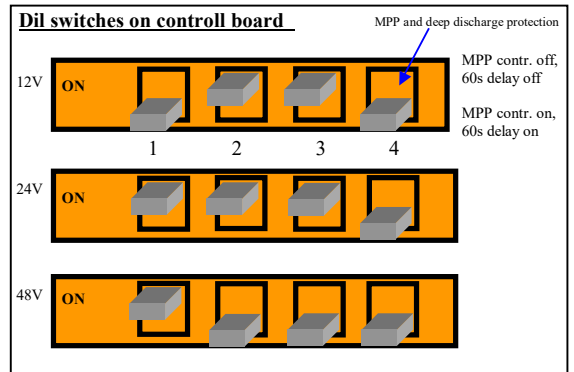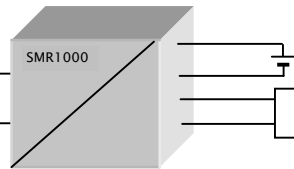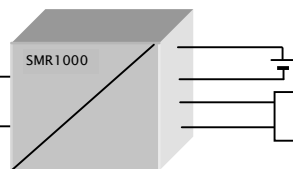## Applications:

Configuration with optimal effectivity
2 modules – string, 72 cells.
Umpp=34V, Usoc=41.5V
Pnom=1200Wp,
Effectivity=96% @ 0.1Pnenn
95% @ 0.5Pnenn, 92%@1Pnenn
24V-Battery system, I_Battery=40A

SMR1000

Dil switches on controll board   MPP and deep discharge protection

12V   ON

MPP contr. off,
60s delay off

MPP contr. on,
60s delay on

1   2   3   4

24V   ON

48V   ON

SMR1000
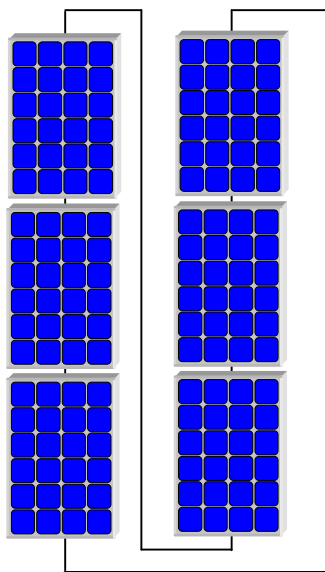
Configuration with
maximum Solar voltage
6 modules – string, 216
cells.
Umpp=102V, Usoc=124V
Pnom=1200Wp,
Effectivity=81%@ 0.1Pnom
91% @ 0.5Pnom, 89% @1Pnom
24V-Battery system,
I_Battery=40A

Technical data are subject to change