

Ovládání fotovoltaiky programovatelným automatem

(Energetická gateway pro obnovitelné zdroje)

Dušan Ferbas

Solar Monitor s.r.o.

Komponenty systému

Modulární koncepce

Cenově výhodné senzory



Monitoring of



Inverters



Safety Relays



String Boxes



Door Contact
(Theft Protection)



Electricity Meters
(AC, DC)



Overvoltage
(Lightning Protection)



Sensors (Irradiation,
Temperature, Wind)



Podporovaná zařízení

AEG
Power Solutions



Danfoss



DIEHL



K A C O 
new energy.

KOSTAL



mavi solar



MNik
Omnik New Energy

OMRON

 **pairan**



POWER-TRAP®




Satcon™

Schneider Electric

SIEMENS

siliken
innovation experience



solar edge



SOLU energy TRONIC

teca
Elektronik



SUNGROW

Sunville

sunways
Photovoltaic Technology

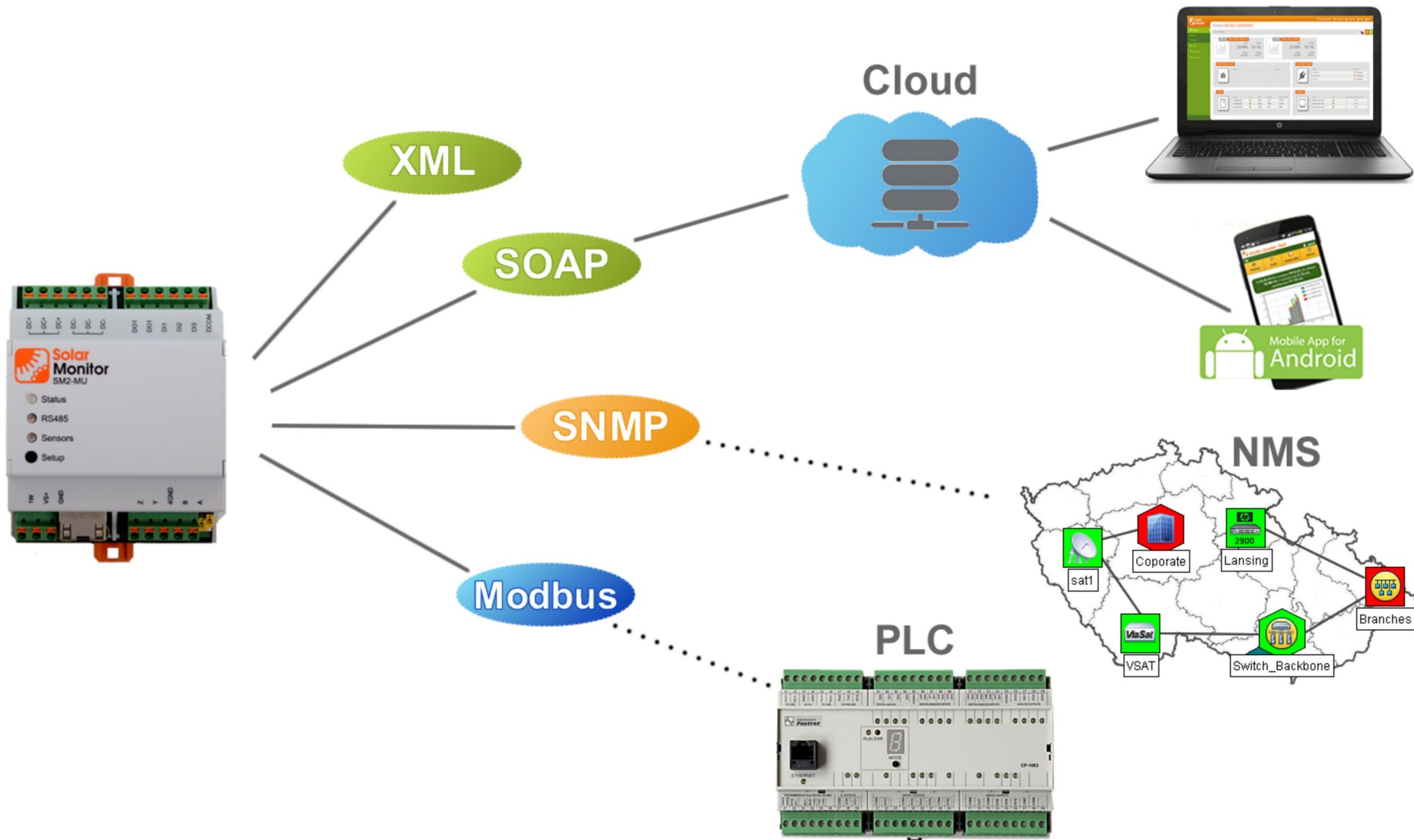
VACON®

xantrex

Solar Monitor – Oblasti použití



Přehled M2M rozhraní (software)



Webový server SM2-MU: Responzivní design



Overview SolarMonitor - Studer Test

Overview

Peaks

LCD Panel

Charts

Alerts

Home > Overview



Inverters (Hybrid)



Name	State	Mode	Temperature	Grid power (0.2kW)	Power (0.2kW)	Updated
XTH 8000-48V (L1)	✓	Charger	- °C	104.98 W	141.96 W	0s
XTH 8000-48V (L2)	✓	Charger	- °C	151 W	42.99 W	0s
XTH 8000-48V (L3)	✓	Charger	- °C	-20 W	42.99 W	0s

MPP Trackers



Name	State	Mode	Temperature	Arr Power (0kW)	Power (0.1kW)	Updated
VT 80-48V	✓	Night	22 °C	0 W	52 W	0s
VS 70-48V	✓	Night	22 °C	0 W	0 W	0s
VS 120-48V	✓	Night	22 °C	0 W	0 W	0s

SNMP – Castlerock SNMPc: Geografické mapy

The screenshot displays the SNMPc Management Console interface. On the left, a tree view shows the network hierarchy under 'Root Subnet', including 'Discovered Objects', 'Backbone', 'Coporate', 'Intl', and various regional nodes like 'CRC_HQ', 'Dallas', 'Denver', 'Lansing', 'Miami', and 'NY'. The main area features a geographical map of the United States with icons for 'CRC_HQ', 'Denver', 'Dallas', 'Lansing', 'NY', and 'Miami'. A network topology diagram on the right shows a 'Company_WAN' connected to various devices including 'HP_8200', 'WAP_1', 'VoIP_CM', 'Backup', 'Cisco_7200', 'Servers_1', 'App_Server', 'DNS', 'Exchange', and 'UNIX'. The bottom panel shows a log of events with columns for severity, date, time, source, and message.

Severity	Date	Time	Source	Message
Normal	09/10/2009	14:15:28	User-PC	Sntp Service Up
Normal	09/10/2009	14:41:16	DNA	Device Responding to Poll
Normal	09/10/2009	15:03:58	San_Jose	Trend Report Agent Connected to Server
Normal	09/10/2009	15:09:51	Florida	Device Responding to Poll
Normal	09/10/2009	15:10:38	Dallas	Device Responding to Poll

Ukázka programu pro PLC Foxtrot: čtení dat

```
PROGRAM prgMain
  VAR_INPUT
  END_VAR
  VAR_OUTPUT
  END_VAR
  VAR
    enable : BOOL := 1;
    ip : STRING := '192.168.1.221:502';
    chanCode : UINT := ETH1_uni0;
    tcp : BOOL := TRUE;
    sm : fb_Solarmonitor10;

  END_VAR
  VAR_TEMP
  END_VAR

  sm(enable := enable, ip := ip, chanCode := chanCode, tcp := tcp);

END_PROGRAM
```


Ukázka programu pro PLC Foxtrot: řízení výkonu

```
PROGRAM prgMain
  VAR_INPUT
  END_VAR
  VAR_OUTPUT
  END_VAR
  VAR
    enable : BOOL := 1;
    unitID : USINT := 5;
    sm_pc : fb_PowerControl30;
    ip : STRING := '192.168.1.221:502';
    chanCode : UINT := ETH1_uni0;
    tcp : BOOL := TRUE;
    val : UINT := 60;
    active : BOOL := TRUE;

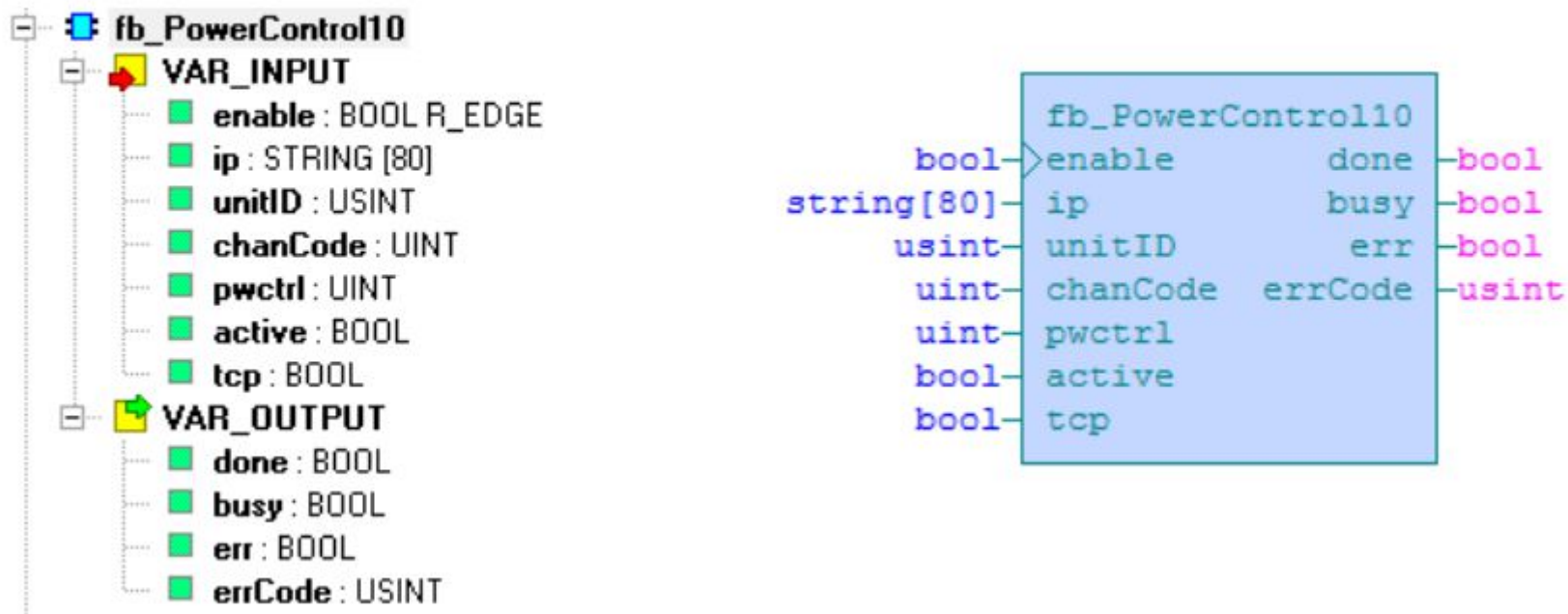
  END_VAR
  VAR_TEMP
  END_VAR

  sm_pc(enable := enable, ip := ip, unitID := unitID, chanCode :=
chanCode, tcp := tcp, pwctrl := val, active := active);

END_PROGRAM
```

Ukázka funkčního bloku v prostředí Mosaic

5.3 Funkční blok „fb_PowerControl10“



Ukázka grafu: normální průběh, za dne bez odběru



Od 04.07.2018

Do 04.07.2018

dnes

listopad

2018

Dashboard

Solar Production

Max: 2.94 [kW]
Energy: 23.69 [kWh]

Consumption

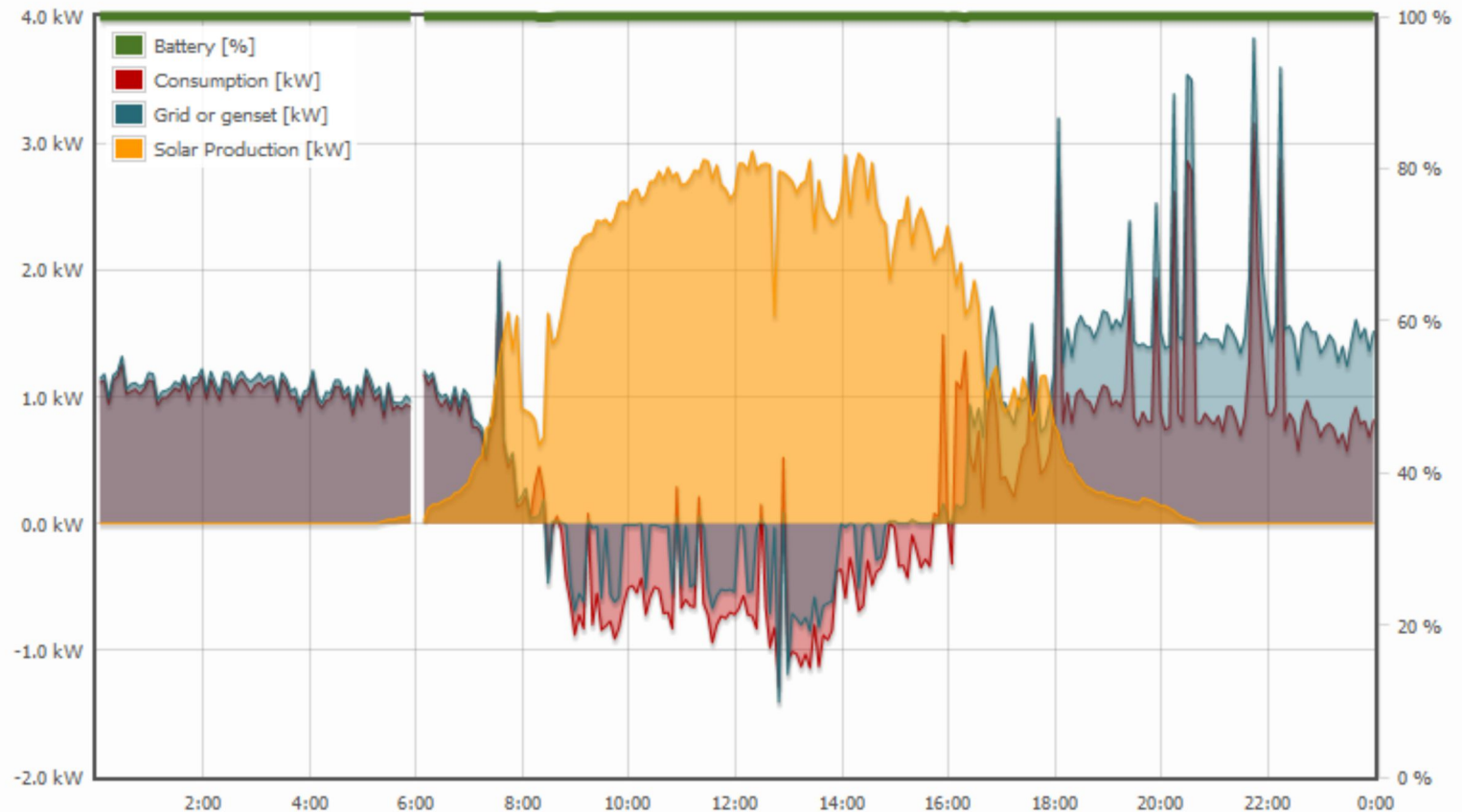
Max: 3.16 [kW]
Energy: 11.33 [kWh]

Grid or genset

Max: 3.83 [kW]
Energy: 18.13 [kWh]

Battery SOC

Max: 100.00 [%]
Min: 99.81 [%]



Ukázka grafu: normální průběh, odběr přes den



Od 30.07.2018

Do 30.07.2018

dnes

listopad

2018

Dashboard

Solar Production

Max: 3.00 [kW]
Energy: 25.23 [kWh]

Consumption

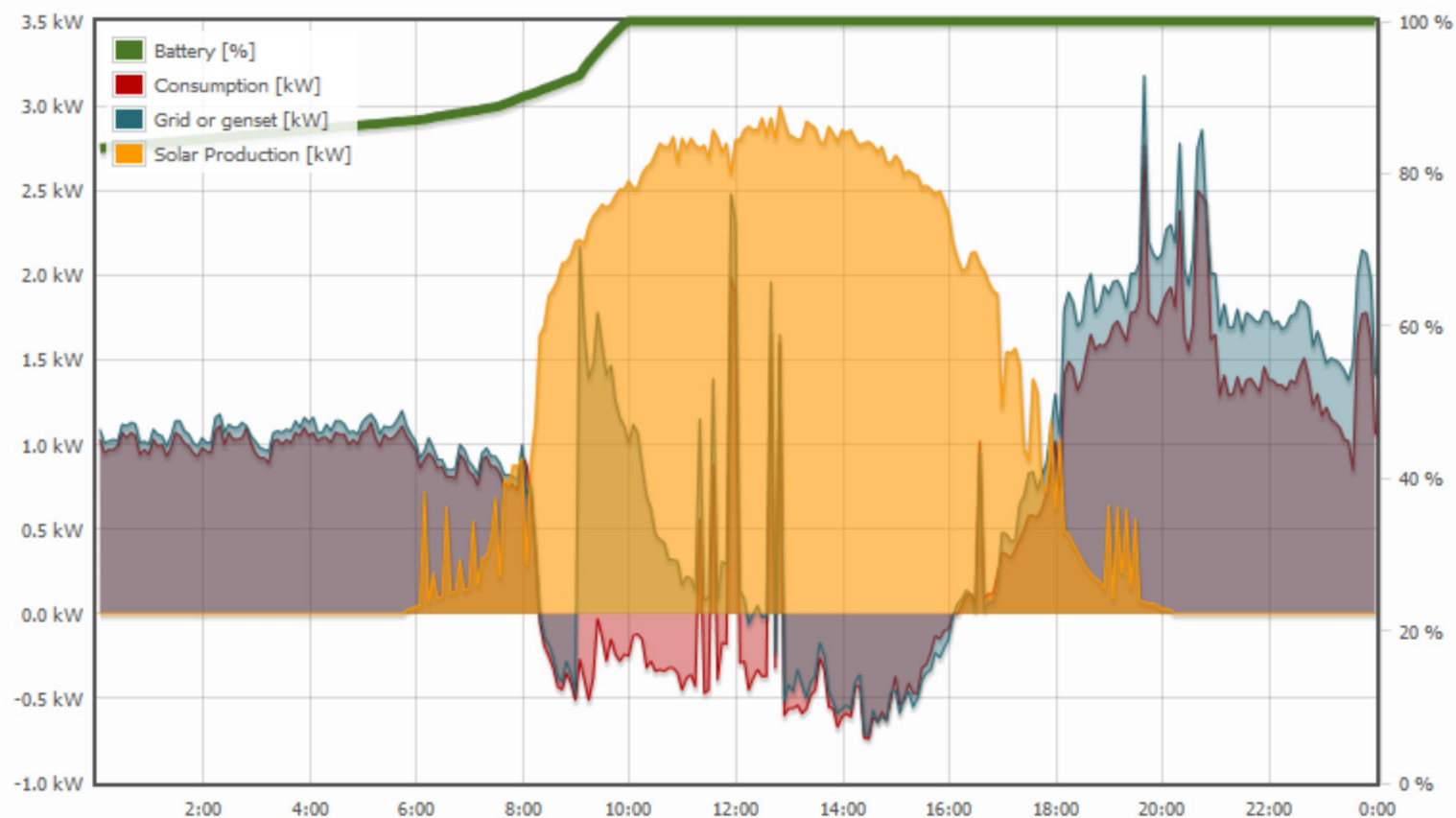
Max: 2.77 [kW]
Energy: 16.04 [kWh]

Grid or genset

Max: 3.18 [kW]
Energy: 22.24 [kWh]

Battery SOC

Max: 100.00 [%]
Min: 83.31 [%]



Ukázka grafu: rostoucí odběr přes den i večer = ?



Od 27.08.2018

Do 27.08.2018

dnes

listopad

2018

Dashboard

Solar Production

Max: 5.86 [kW]
Energy: 33.14 [kWh]

Consumption

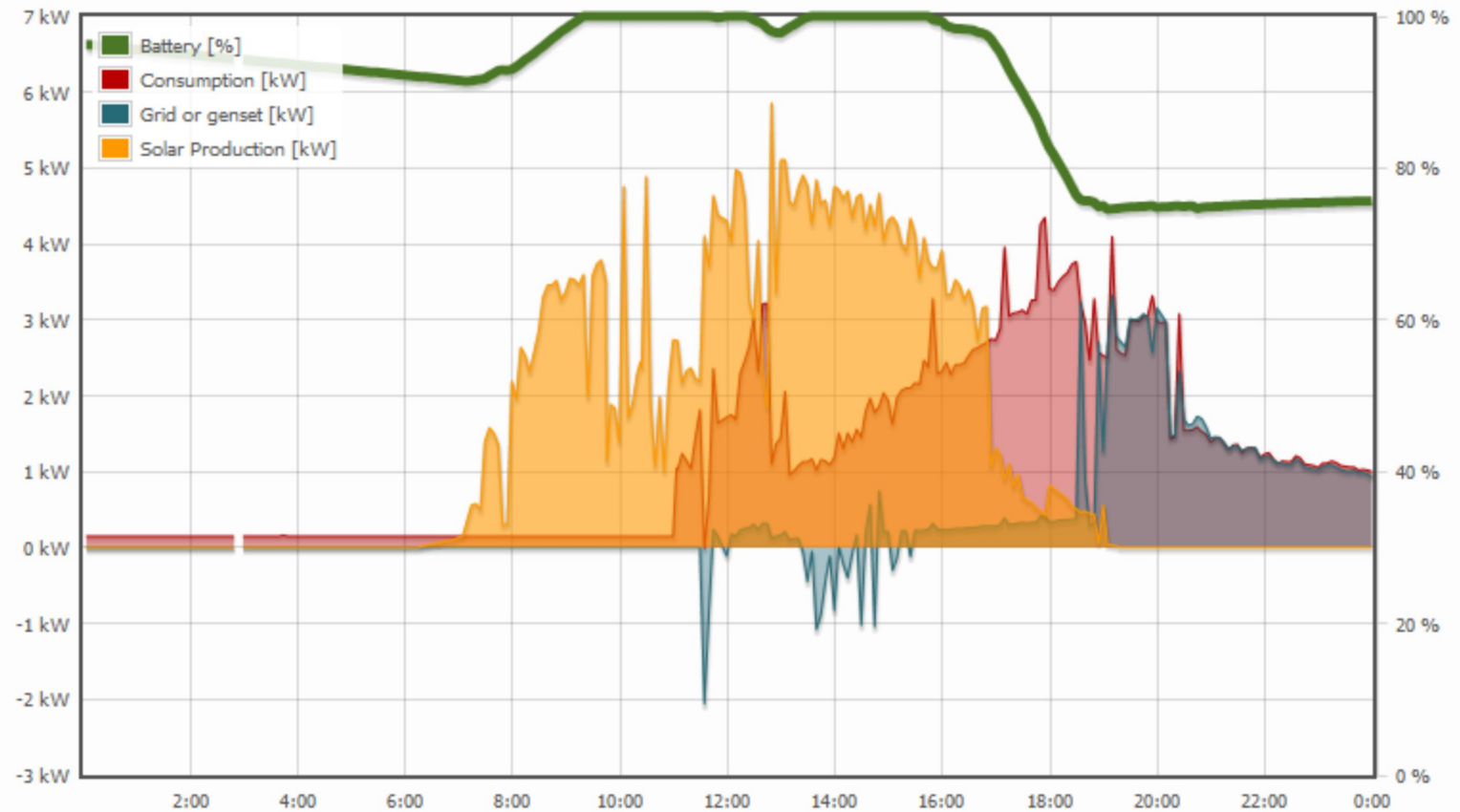
Max: 4.35 [kW]
Energy: 28.23 [kWh]

Grid or genset

Max: 3.33 [kW]
Energy: 9.62 [kWh]

Battery SOC

Max: 100.00 [%]
Min: 74.56 [%]



Ukázka grafu: odpolední zátěž vybíjí baterii, špičky



Od 28.07.2018

Do 28.07.2018

dnes

listopad

2018

Dashboard

Solar Production

Max: 3.34 [kW]
Energy: 13.23 [kWh]

Consumption

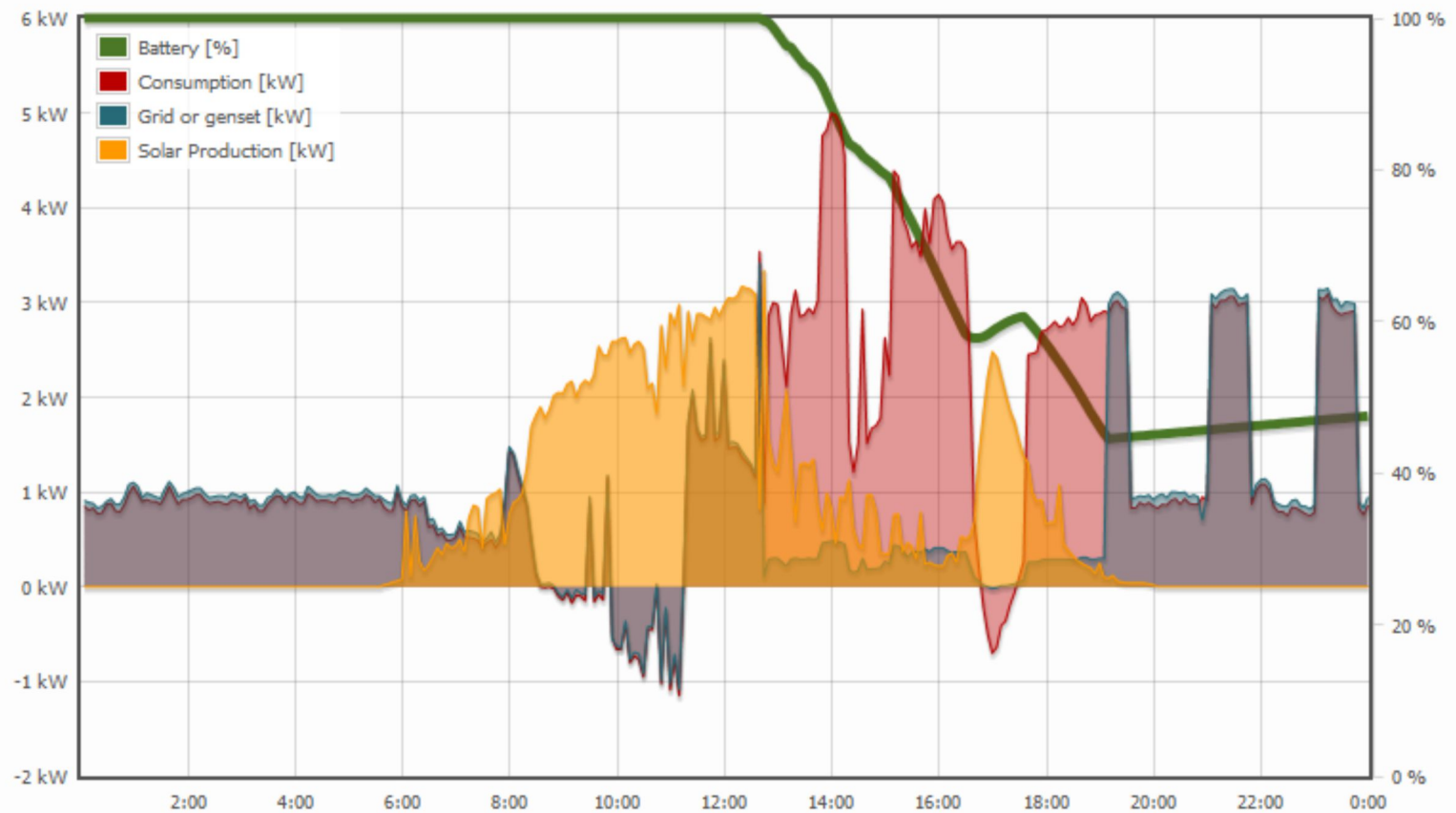
Max: 5.00 [kW]
Energy: 25.97 [kWh]

Grid or genset

Max: 3.42 [kW]
Energy: 11.88 [kWh]

Battery SOC

Max: 100.00 [%]
Min: 44.50 [%]



Ukázka grafu: večerní odběr, noční špička ~ noční proud



Od 30.08.2018

Do 30.08.2018

dnes

listopad

2018

Dashboard

Solar Production

Max: 4.40 [kW]
Energy: 25.54 [kWh]

Consumption

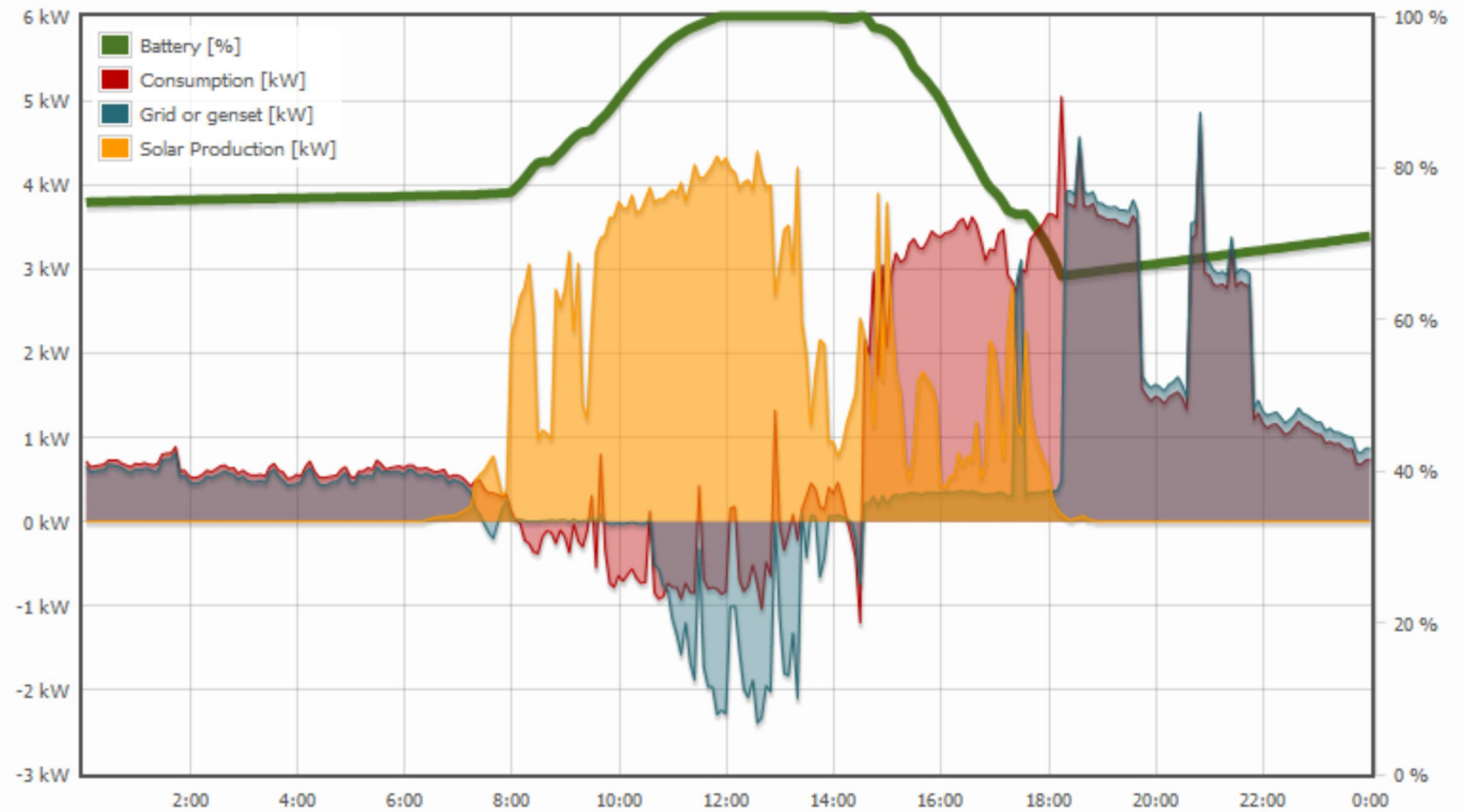
Max: 5.05 [kW]
Energy: 27.15 [kWh]

Grid or genset

Max: 4.86 [kW]
Energy: 14.68 [kWh]

Battery SOC

Max: 100.00 [%]
Min: 65.75 [%]



Ukázka grafu: totéž včetně následujícího dne, nabití bat.

← ↑ → Od 30.08.2018 Do 31.08.2018 dnes listopad 2018

Dashboard

Solar Production

Max: 4.40 [kW]
Energy: 45.60 [kWh]

Consumption

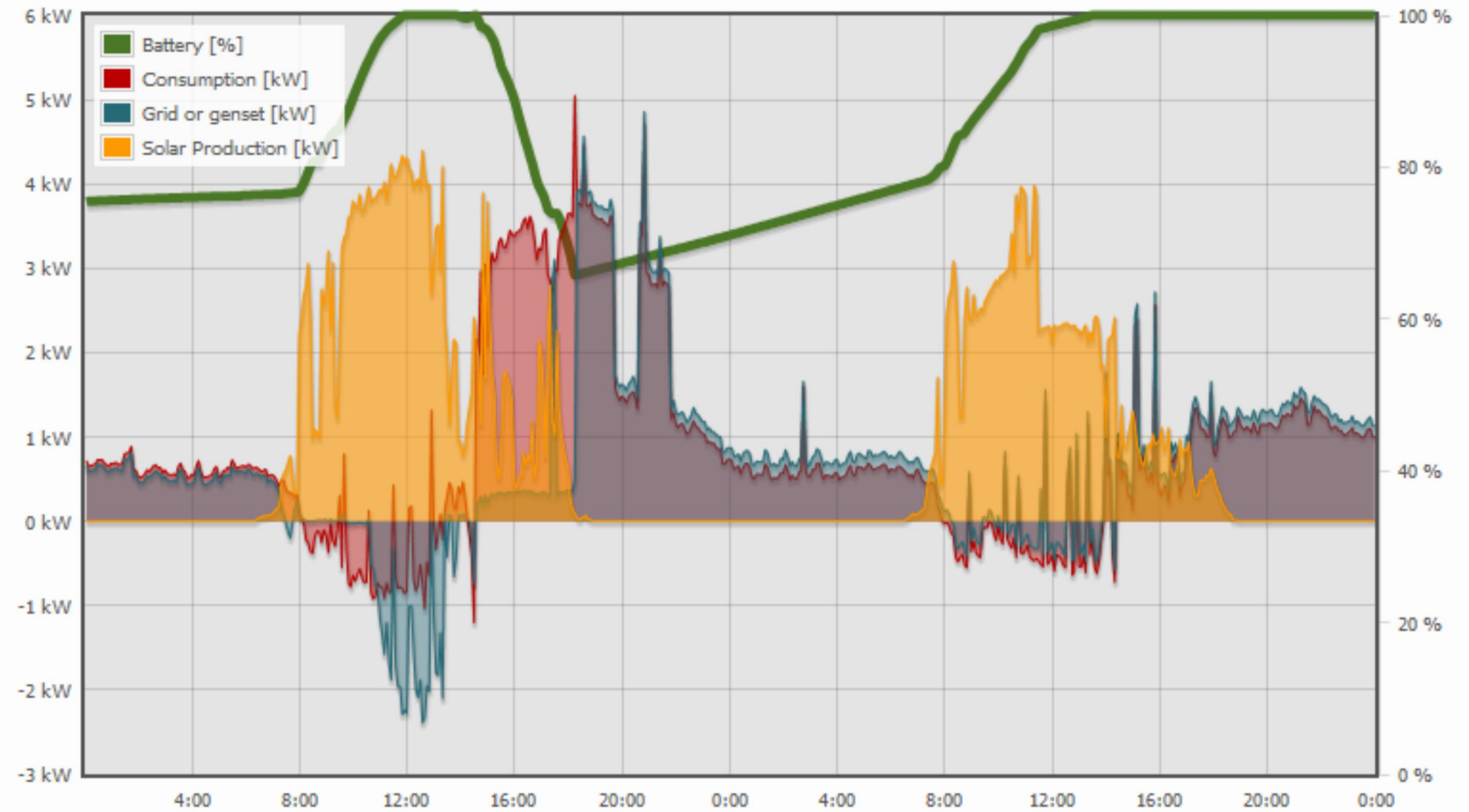
Max: 5.05 [kW]
Energy: 40.26 [kWh]

Grid or genset

Max: 4.86 [kW]
Energy: 31.26 [kWh]

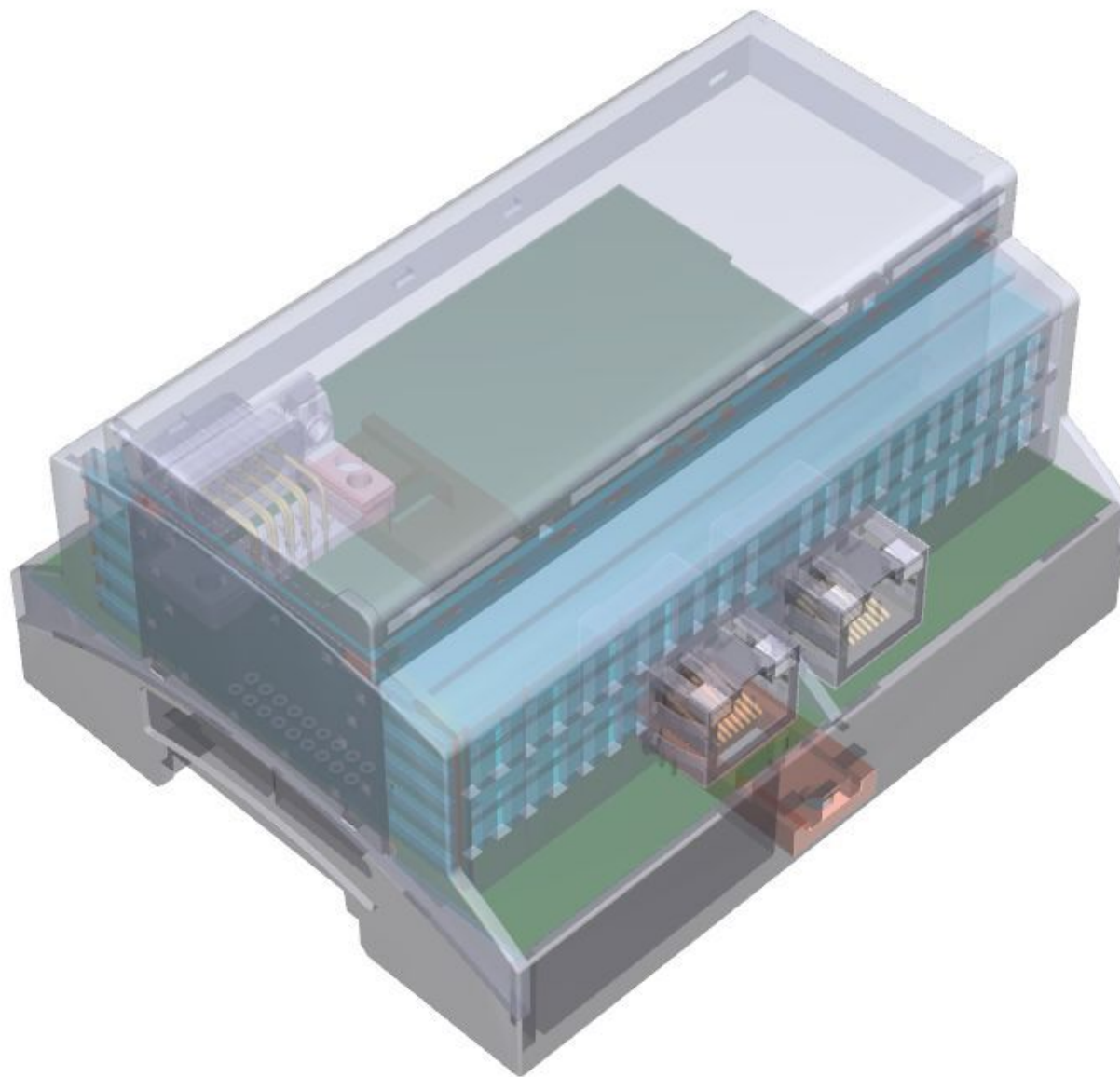
Battery SOC

Max: 100.00 [%]
Min: 65.75 [%]



Připravujeme ... miniCloud

- pro striktní „in-house“ řešení
- vhodné pro Společenství vlastníků jednotek, banky
- 1x Gb ethernet
- 2x ARM Cortex A7, 1 GHz
- RAM DDR3L 1.600 MT / s
- SATA SSD



Děkuji za pozornost.

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