solarworx

Product Catalog

2023/H2

Get in Touch

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SOLEGO – Solar Home System

Modular integrated solar kits for off-grid customers

Unique modular design

The VERASOL certified "Solego" Solar Home Systems can be stacked to allow your customers to climb the energy ladder gradually.

Smart charging

Up to 100W of solar (PV) can be connected. There is a Maximum Power Point Tracker (MPPT) version and a cheaper PWM version available. Smart balancing of the integrated BMS ensures optimal charging.

Remote monitoring & service

Access live energy data from your systems, solve problems remotely and understand the needs of your customers

Local language voice

The system informs about the current status in local languages such as English, French, Swahili, Wolof and Fula. Illiterate customers are able to use the system.

Eco-friendly and health protecting

Enclosure consists of a biopolymer – wood and recycling ABS. The LiFePO4 batteries don't contain any rare earths.

PayGo for easy energy access

1. Customer sends (monthly) payment via mobile money to distributor
2. Customer receives token automatically and unlocks his system via keypad
3. When the last instalment has been made the system unlocks completely

PaygOps
Last-Mile Management System

Paygee
The PayAsYouGo Ecosystem

PineBerry

SOLEGO, ECO, PACK 80/160

Modular solar solutions for a clean energy future

SOLEGO

SOLEGO eco

PACK

	SOLEGO	SOLEGO eco		PACK
Battery type & capacity	12V DC, LiFePo4, All types available in two capacity versions of either 100Wh or200Wh installed (80Wh/160Wh min. usable)			
Mounting	Shelf Mounted	Shelf mounted or Wall mounted (new)		Shelf mounted or wall mounted
Outlets with max. load each	8x 5V USB, up to 1A 5x 12V DC barrel jack (5.5x2.1mm), up to 5.1A 1x 12V DC XT90, up to 8.8A / 17.6A	2x 5V USB, up to 1A 5x 12V DC barrel jack (5.5x2.5mm), up to 5.1A 1x 12V DC XT90, up to 8.8A / 17.6A	5V to 20 V USB C up to 5A 5x 12V DC barrel jack (5.5x2.5mm), up to 5.1A 1x 12V DC XT90, up to 8.8A / 17.6A	2x 5V USB, up to 1A 5x 12V DC barrel jack (5.5x2.1mm), up to 5.1A 1x 12V DC XT90, up to 8.8A / 17.6A
Solar panel	2x 50Wp, max. 25V MPPT controller	Max. 1x 80Wp, max. 25V PWM controller	Max. 1x 80Wp, max. 25V PWM controller	Extension PACK Charged via Solego
Voice output/ HMI	English, French, Swahili, Fulfulde, Wolof, Luganda, Spanish	Display assistance (remaining balance, battery status, charge indicator)		-
PayGo integrations	Angaza, PaygOps, Paygee, Solarworx API, PineBerry	Angaza, PaygOps, Paygee, Solarworx API, PineBerry		-
Activation	Keypad, remote via GSM	Integrated keypad		Paygo via Solego main unit
Remote monitoring	Optional Embedded GSM Modem	Only on request		Monitored via databus in Solego main unit
Weight	1.2kg / 2kg	1.2kg / 2kg		1.2kg / 2kg
Dimensions		Shelf mounted: L 165 x W 165 x H 57 / H 75 mm Wall mounted: L 238 x W 190 x H 60 mm / H 90 mm		
Shipment	Includes USB keypad, phone charging adapter	Includes integrated keypad, phone charging adapter		**Engineered in Germany**

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DC Appliances
Bundle your SOLEGOs with a range of high quality appliances

Appliance	Specifications
25W / 50W Solar Panel	Poly-Si PV module with 18V incl. 7m UV-resistant cable
1W, 2W, 4W LED ceiling lamp	12V, 108, 215, 430 lumen, IP53 water protection, 7m T-cable incl. switch
24", 32", 39" LED TV	9W, 12W, 16W, standby 0.1 W, 16:9, HDMI, USB, decoder required
Hair cutter	5V USB, 2000 mAh lithium battery 3.7 V, 1h autonomy, 4 clipper lengths,
Stereo radio	1000 mAh Li-Ion, UBS-mini, 5V, AUX, Micro-SD, 87.5-108 Mhz, 20 channels
Submersible water pump	12V XT90, flow rate: 6 l/min or 2000 l/day, max. lift 70m, max. submersion 30m
Table fan	5V, low/high 2.5/5 W, 16 cm diameter
Stand fan	12 V DC, 12W oscillating stand fan, 3 speed levels, 40cm blade diameter
Fridge & Freezer	Total capacity 100l, 220 Wh/day (fridge), 450Wh (freezer), R600a
AC/DC inverter	Victron Phoenix AC/DC pure sine wave inverter (continues power 250 VA)
Laptop Charger	12V, up to 90W, wide range of adapters (e.g. Apple, Lenovo)
Victron PayG Dongle / Paygo Switch	Converts Victron devices in PayGo SHS / Enables generic SHS into PayGo SHS

> Further appliances on request

# Victron PayGo & Monitoring Dongle

Turn your VE.Direct Victron devices into paygo systems

Description

Various Victron devices such as the RS or the Phoenix line support the VE.Direct protocol. The protocol not only allows reading out data from the Victron device such as power output of an inverter but also comes with an in-built token system used for PayGo. The paygo feature locks and unlocks the device function depending on the unlock code (token) that was entered into the keypad or respectively was send to the device remotely by the optional GSM modem integrated into the keypad device. The keypad device is compatible to all known token systems like the OpenPAYGO™ Token. The optional remote monitoring feature roams into most of the larger Telco networks worldwide and allows remotely monitoring your connected VE.Direct enabled device.

Installation
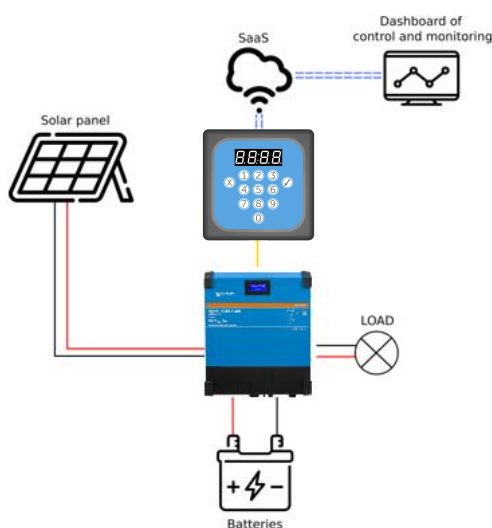
Product Features

- Designed to work with all VE.Direct enabled Victron devices
- Connection to Victron device via VE.Direct data cable (included)
- Coin Cell keeps device token timer (RTC) also in situation of SHS undervoltage cut-off
- Remote Control (optional on request)
- Membrane Keypad (keys: 0-9, enter, delete)
- Weight: 150g
- PCB Size: 105 x 105mm
- Case Size: 110 x 110 x 30 mm
- Layout: flexible colors/writing/company logo
- Mounting with adhesive tape against Victron device, alternatively with two mounting holes for nails or screws
- Integration with all known token systems, e.g. offered by Paygee (Engie) or paygOps (Solaris)
- Display: 4-digit 7 Segment display, indicating remaining runtime days and minutes

Description

The PayGo switch is typically used in Solar Home Sytems that consist of the standard configuration Charge controller, external battery and solar panel. The switch is then introduced between the Charge controller load terminal and the actual load. In order to prevent tempering charge controller and PayGo Switch are placed into the same outer box. The PayGo switch relies on the protection features like undervoltage and overcurrent of the Charge controller. The PayGo switch is principally compatible to all known PayGo platforms like PaygOps and Paygee but also can be used with an proprietary implementation of the OpenPAYGO™ Token. As long as the timer has not counted to zero the device switches on the load and will cut once the timer reaches zero. The timer also continues counting even when the SHS has switched off the load.

Installation
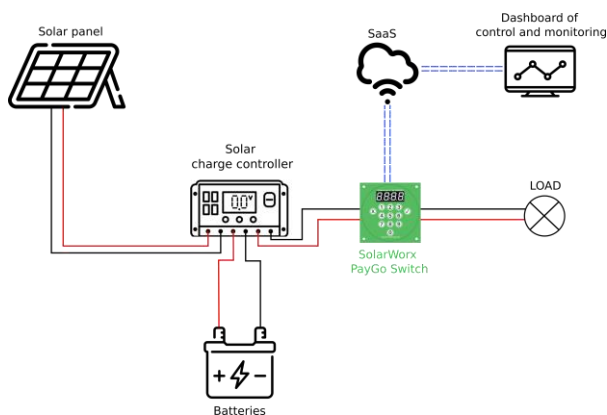
Product Features

- Designed to work with 12V and 24V SHS
- Max Current 20A via MOSFET
  (for AC SHS switch via relay on request)
- Coin Cell keeps device token timer also in situation of SHS undervoltage cut-off
- Remote Control (optional on request)
- Membrane Keypad (keys: 0-9, enter, delete)
- Weight: 81g
- PCS Size: 133 x 105mm
- Membrane Size: 105 x 105mm
- Layout: flexible colors/writing/company logo
- Visible Area 10cm diameter circle in SHS box
- Screw hole diameter for mounting M5
- Enclosure can be provided on request
- Display: 4-digit 7 Segment display, indicating remaining runtime days and minutes

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MESH Grid
Efficient and affordable DC Power grid for energy sharing

RESIDENTIAL SOLAR POWER INSTALLATION
PROSUMER
Larger PV installations owned by residents or ESCO with lead carbon batteries and charge controllers connect to the power grid through the mesh device.

Features

Transmission
45-72V DC droop Control regulation

Capacity and usage
Energy is consumed or generated from 12V DC level. Each device provides 250W feed-in (from SHS) or take out. Seamless transition from production to consumption

IoT - Monitoring
LoRa and GSM 10min update interval

Billing and control
Via Android app

12V

60V

12V

12V

SOLAR HOME SYSTEM OWNER
PROSUMER
Solego Solar Home Systems and those of other manufacturers can be integrated into the power grid. Additional income is generated by selling energy and whenever the battery is empty the grid will continue power delivery.

STAND-ALONE MESH DEVICE
CONSUMER
Customers without their own solar energy system can be integrated into the power grid as pure consumers.
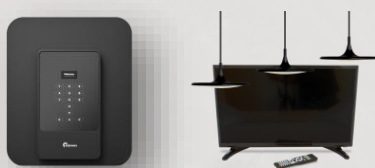
# How the MESH Grid Installation Works
An example MESH Grid

Estimated Requirements for a MESH Village

The size of the village, village location, and the number of total desired appliances will determine the village's total estimated energy consumption. These factors will impact project planning and costs. To provide an approximate estimate, each MESH project will need:

- An average of 1 prosumer system per 10 consumers
- 850W (2x 425W) Solar Panel per prosumer
- 2.4kWh (2x 1.2kWh) Battery capacity per prosumer
- 0.8kW Charge Controller per prosumer
- 1 MESH device per entity (including both prosumers & consumers)

Larger generator (prosumer)

Smaller generator (prosumer)

Smaller Consumer

Larger consumer
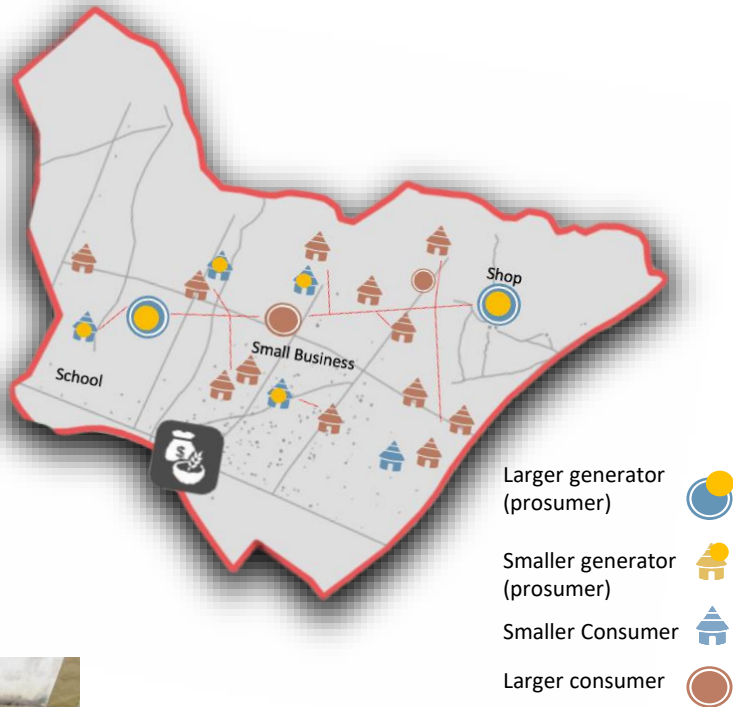
Planned requirements for a Village with 100 MESH connections

- 30 425W Solar Panels
- 15 0.8kW Charge Controllers
- 40 Batteries 100Ah/12 V
- 100 MESH devices

General Specifications

Grid Side	Operation voltage: 45-72VDC (adjustable via APP)
User/Low Side	Operating voltage: 13.3VDC if no battery connected (consumer mode), otherwise 12/24V battery autodetection (prosumer or mixed mode)
Max power sharing	12V 250W or 24V 500W (bi-directional, meaning each device can either be used as generator/Prosumer or Consumer and will also seamlessly transition between the modes)
Electrical characteristic	• Max conversion efficiency 96%, bi-direction two phase Buck-Boost DCDC converter. • If both phases are on they operate 180° phase-shifted for better dynamic and efficiency.
Outlets	• 2x 5V USB, up to 2A each • 5x 12V DC barrel jack (5.5x2.5mm), up to 5.1A • 1x 12V DC XT90, up to 20A (at back of device for battery connection up to 90A) • 2x banana/screw terminals (yellow/black for grid connection up to 25A) • 2x banana/screw terminals (red/black for heavy load connection up to 25A)
Mechanical	• Weight 0.5kg • L 165 x W 165 x H 57
Hardware Protection	• overvoltage clamping 30V (lowside), 80V (highside) • Analgue reverse polarity protection on Grid and low side • Overcurrent on grid and battery side with ATO fuse
Software Protection	Software Fault detection: broken Fuse, broken Mosfet, overcurrent, overvoltage
Startup behavior	Grid starts autonomously if battery power is sufficient. Prosumers synchronize for simultaneous startup to run against connected capacitance.
IoT/Connectitity/Payment	• Multi-Gateway concept via GSM for high level of redundancy, ca. 10% of all devices are Gateways. All devices are interconnected via LoRa MESH modules with each other for metering, token transfer and control. • Metering balance unlocked via APP with automatic sync to devices • Monitoring of device performance via Solarworx Frontend or API • Integration with SaaS such PaygOps and PineBerry
Grid Topology and setup	• 2 to 100 (Households/SMEs) per grid cluster • 10mm2 single core aluminum, 6mm2 branch connection

Frontend

APP

MESH

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