Reliable power and energy for everyone, everywhere

offgrid and ongrid swiss made power electronics

Unlock your solar potential with Studer

Swiss made power

Energy is essential for meeting human needs: light, heat, health, food, communication and education.
Solar energy has been used to cover basic needs for decades and is now on its way to transform the general energy supply of the world, promising a more sustainable future.

With decades of experience in this field, Studer Innotec offers products for solar energy access in all environments: for remote areas without the electrical grid (offgrid) and for modern way of life with all the comforts of houses connected to electricity network (ongrid).

1-2 **Company**
Working with Studer is a rewarding partnership that allows you to build business

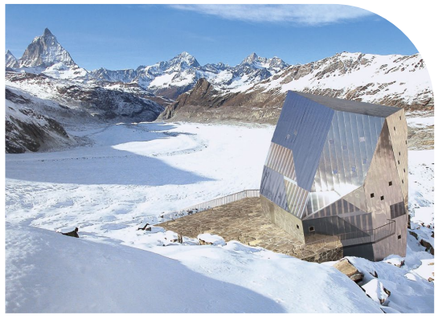
3-14 **Products**
Our extensive range of smart inverters and solar charge controllers are the right fit for multiple applications

15-24 **Applications**
Powering a better future together, our aim is to bring sustainable energy everywhere
- 17-20 Offgrid
- 21-24 Ongrid

25-26 **Monitoring**
Keep an eye on your systems with professional tools

27-28 **Let's collaborate**
Partner with us to take your business to the next level

29-38 **Datasheets**
All technical details you want to know for each model



⚑ 3000m (Switzerland)

⚑ 4100m (Chile)

⚑ 5000m (Peru)

⚑ 6510m (Chile)

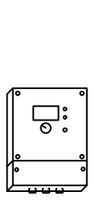
Clean energy since 1987

The company's factory is in Sion, where our innovating high-quality products are complemented by a human-sized service.

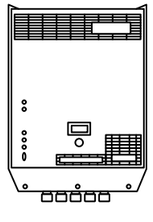
Studer is a employees-owned company driven by Swiss innovation with +38 years of experience in power electronics for battery-based systems. Studer worked to bring innovative power solution to remote areas, first in the mountains of Switzerland and then worldwide to cope with energy needs in rural electrification. Present in more than 150 countries with a network of 120+ Studer professional partners, Studer already has 500k systems globally installed. Reputation of the brand is built on the robustness and reliability of our products, and this allows our partners to build energy systems with confidence.

The company manufactures a wide range of excellent power electronic devices proposing exclusive solutions towards the energy transition. 35% of human resources are in R&D, to bring innovative products on the market. Quality and technology allows for unparalleled efficiency and reliability.
The design, manufacture and testing activities are made in our ISO certified factory 9001:2020/14001:2020 in Switzerland with 100% renewable energy.

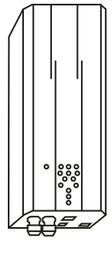
⚑ Picture: Sion (Switzerland)



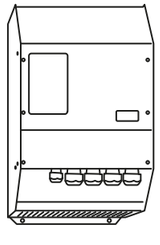
1987
SST-02
First solar regulator



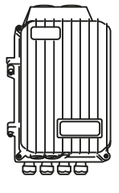
1995
TwinPower
First sine wave inverter



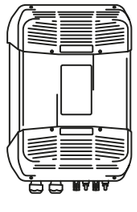
1998
Compact
First inverter charger still produced



2007
Xtender
First Xtender multi-unit system

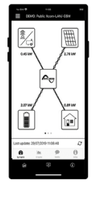


2011
Variotrack
First solar MPPT charge controller

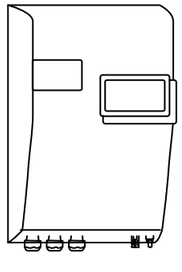


2014
VarioString
First High Voltage MPPT solar charge controller

2018
Studer portal
Professional remote monitoring and control

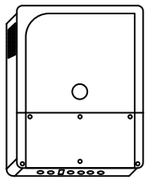


2019
Easy monitoring app
Previous end-user remote monitoring



2021
Next3s
First 3-phase all-in-one smart inverter charger

2024
Studer monitoring app
New remote monitoring + configuration of next series



2025
Next1
New single phased battery inverter charger for multiple applications

Products

Check out our extensive ranges of products

		Next3s	Next1	Xtender	Variotrack	Variostring	AJ
	power range	15kVA - 45kVA	4.5kVA - 58.5kVA	700VA - 72kVA	625W - 75kW	4.2kW - 105kW	275VA - 2.4kVA
	Number of models [1]	2	2	25	3	2	40
Function	Inverter DC to AC	•	•	•			•
	Charger AC to DC	•	•	•			
	Solar DC to DC	• MPPT			• MPPT	• MPPT	option PWM
	Gridfeeding	•	•	•			
	Multi-units operation	3	9	9	15	15	-
	Flex[2]	•	•				
Available for batteries	12V			•	•		•
	24V			•	•		•
	48V	•	•	•	•	•	•
Markets	Offgrid	•	•	•	•	•	•
	Ongrid	•	•	•[3]	•	•	

[1] This includes various DC voltages, AC with 230V/50Hz or 120V/60Hz, optional solar variants
[2] Flex is an AC connection that can be configured as a second input or second output
[3] With some limitation due to new grid codes conformity

Go to page 5

Next1, Next3s

A new generation of smart inverter chargers, rack integrable.

Integration example (Infra)

A complete energy infrastructure

Go to page 9

Xtender

Multi-functional offgrid battery inverters

Go to page 11

Vario

Low and high voltage MPPT solar charge controllers

Go to page 13

AJ

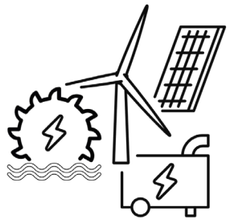
Pure sine-wave offgrid inverters

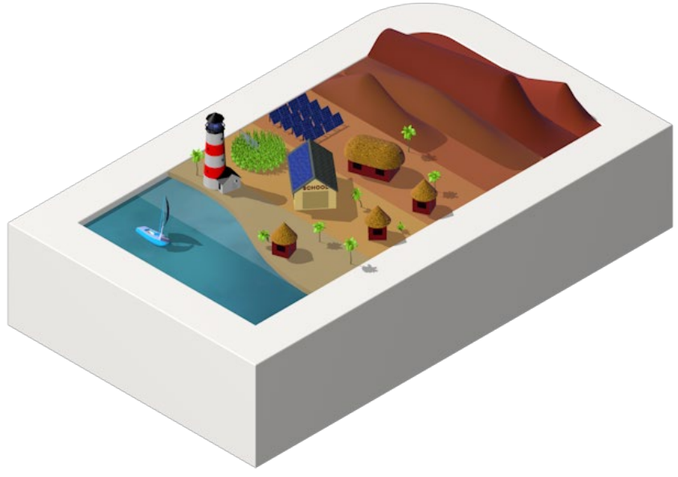
Applications

Produce, store and consume solar power with our innovative solutions for all situations

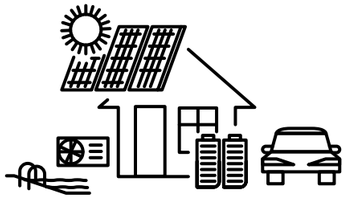
See details on pages 15 to 24

Offgrid





Ongrid



AC Solar Home Systems (SHS) page 17

The simple and robust AJ series inverter provides a long-time validated solution for small systems in rural electrification projects. Larger systems with Xtender, Next inverters-chargers and completed with a range of Vario solar mppt chargers.

Hybrid solar-diesel page 17-18

Genset managed in an optimal way with Xtender, Next1 + Vario. Beyond your expectations with Next3s : all in one solar hybrid inverter of 15 kW that work in parallel up to 45 kW.

Minigrid village electrification page 19

Centralized systems up to 72 kW and smart decentralized minigrid are possible with Xtender. DC-coupling or AC-coupling configurations to integrate multiple sources.

Mobile power page 20

Caravaning, ambulance or boats: all need to have electricity when the engine is stopped

Solar Backup page 23

With week grids and long blackout, local solar production to complement storage is a must.

Grid connected solar page 21

More than solar self-consumption, we propose self-sufficiency: storage of solar energy for the night, operation in case of grid failure with inverters that is designed with 38 years of experience in offgrid with the Next series.

Smart Energy Management page 22

Intelligent features ready for the grid of tomorrow: integration with EMS, ability to recharge EVs, AC-coupling with grid inverters and more…that's the Next range

And your application...

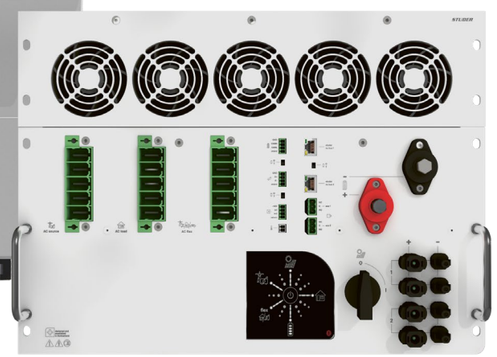
Flexibility is a characteristic of our products.
Ask us for a solution: info@studer-innotec.com

Next3s

100% offgrid, 100% ongrid

3-phase 16 kVA inverter-charger with 2 built-in solar MPPT inputs 8 + 8 kW.
The Next3s is the allrounder that can do it all: management of multiple gensets, 2x surge power in offgrid, different energy management possibilities, AC-coupling, the new AC flex connection, certified with main grid codes and many more...

Wall mounted



Rack 19”

More information

studer-innotec.com/next3
Page product including technical specifications.
Visit the downloads section for additional documents (datasheet, manual)

All-in-one

Straightforward installation and wiring. Up to 900Vdc MPPT input and 22 KWp installed solar power for flexible design. Full back-up capabilities with surge power. Compatible with modern grid-codes.

Multi-units

Possibility of multi-units (3x) for systems up to 48kW
One transfer of 80A (55 kVA).

Multiple battery technology

Lithium 48V with CAN-BMS, Lead-Acid, AGM, Super-Cap... (configurable). Advanced management of batteries for life optimization (B.L.O., adaptative SOC, …).

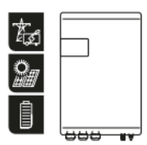
Double AC-in or AC-out

The unique AC flex smart interface can be configured as a second source or an extra controlled load. Fully monitored connection for open possibilities: generator, EV charger, load management…

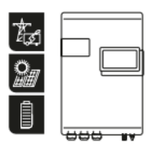
NextOS: open interface

An intuitive smart platform to configure, control and analyse your system. Open to the world with Wi-Fi connection, Internet monitoring, OTA update, API and MODBUS RTU/TCP control.

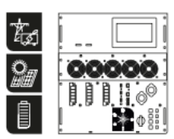
Options & accessories



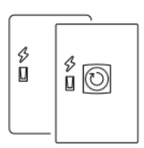
nx3 st
next3 full option (standard)



nx3 sti
next3 full option + interface

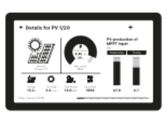


nx3 rack sti
next3 full option + interface

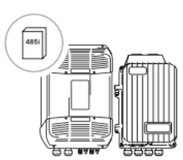


nx bypass box

nx tempSensor
battery temperature sensor



nx interface
next3 user interface

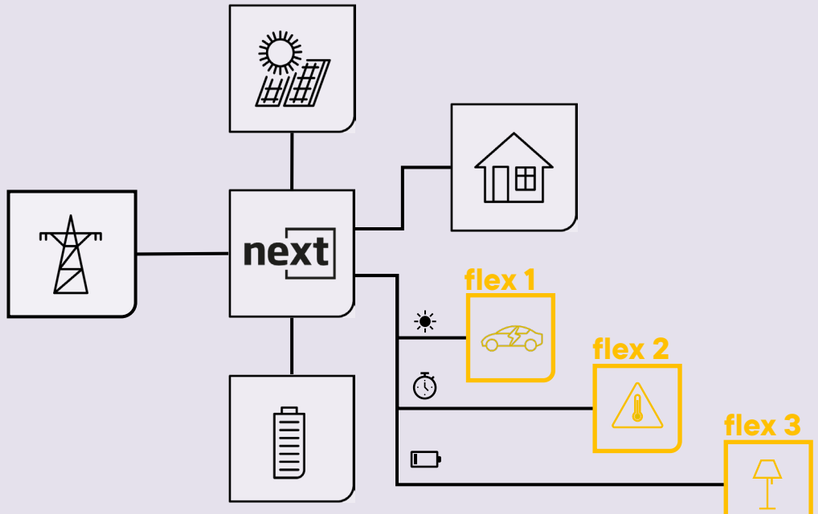


nx vario
solar charger controller

nx powermeter
AC meter for advanced EM

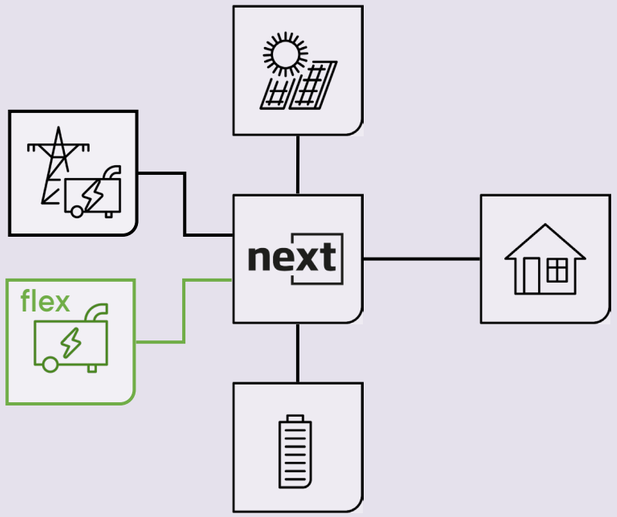
All in one hybrid inverter with the unique AC-flex feature

AC flex is a three phased AC connection that can be configured at commissioning to be connected to an AC source or to AC loads, opening a range of possibilities in system design.



Use the AC flex connection to manage loads:

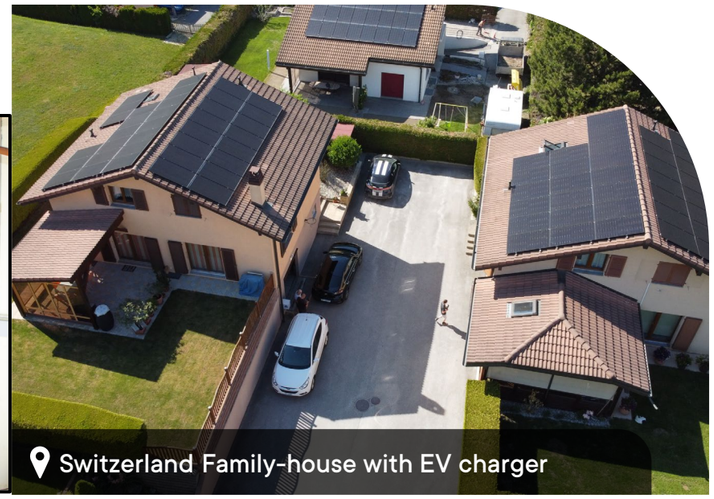
- A second fully monitored output, for a better energy use understanding
- A programmable connection/disconnection for load management (in function of SOC, solar production, grid power, …), independent for each phase
- Connection of a solar inverter for a fully monitored AC coupling



Use the AC flex connection to manage a second AC source:

- Have the standard grid connection complemented by a genset for emergency in case of long blackouts
- Stage two gensets in offgrid for fuel efficiency

Residential smart self-consumption



Backup, solar AC + DC

Offgrid

Next1

Smart inverter-charger

The heritage of 38 years of experience: a single-phase smart inverter-charger with low frequency topology ensuring the highest overload capability and the minimum standby consumption. All the best is in it for an unbreakable inverter: robustness, surge power, IP65, connectivity.

IP65

nx1 6500-48
nx1 4500-48
wall mounted, rackable

100% offgrid, 100% ongrid

Full backup capabilities with peak power. Integrated double relays transfer switch compatible with last grid codes

Multi-units

Single-phase, bi-phase, three-phase, parallelling, up to 9 units per system is possible

Solar AC

AC-coupling of solar inverter for new or retrofit of installations

Solar DC

DC-coupling with Studer MPPT solar-charger for best efficiency

Multiple battery technology

Compatible with almost every battery technology. CAN-BMS integrated for lithium batteries and programmable voltage/current control for traditional lead-acid

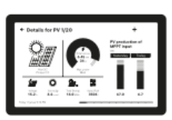
Double AC-in or AC-out

The unique AC flex smart interface can be configured as a second source or an extra controlled load. Fully monitored connection for open possibilities: generator, EV charger, load management…

Interface, connectivity and monitoring: embedded nextOS

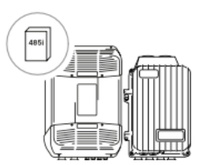
Built-in board with all features: Wi-Fi, local webinterface, your smartphone or tablet is the new nx-interface with at no additional costs. Internet with free monitoring portal and app, CAN to BMS, Modbus TCP.

Accessories and compatibility

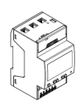


nx interface
next user interface

nx tempSensor
battery temperature sensor



xcom 485i-nx
Communication with vario solar charge controllers

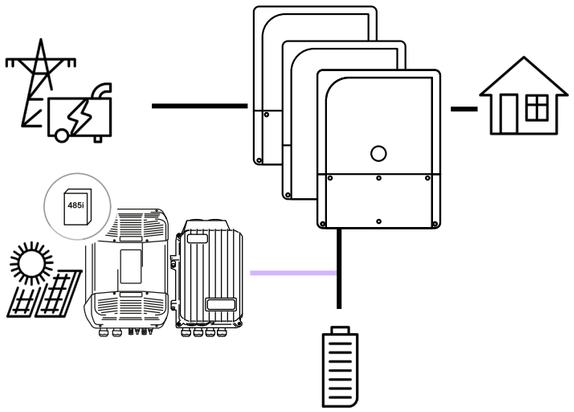


nx powermeter
AC meter for advanced EM

More information

studer-innotec.com/next1
Page product including technical specifications.
Visit the downloads section for additional documents (datasheet, manual)

Full versatility for a great variety of energy autarky applications



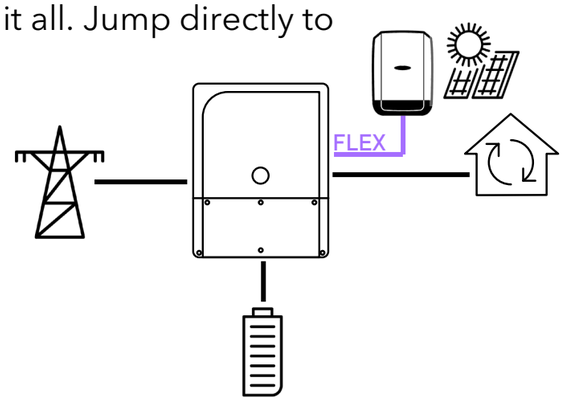
Flexible design for offgrid

Solar AC
with grid inverter

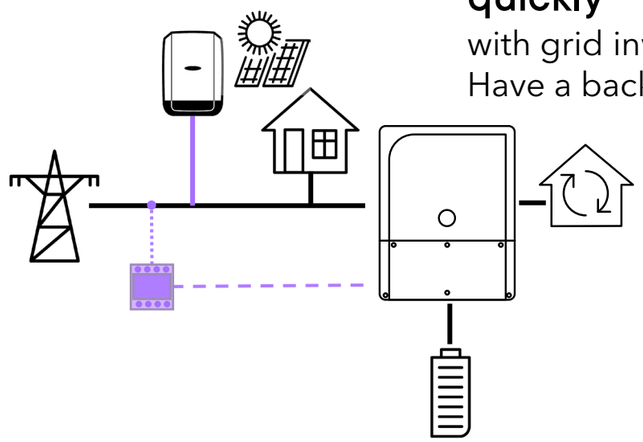
Solar DC
with Vario + Xcom485i

A world of possibilities for ongrid

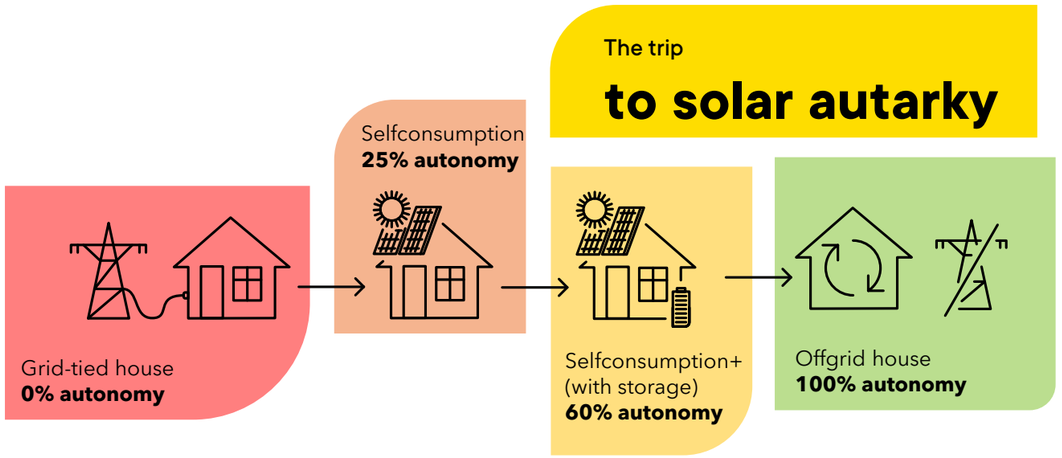
Direct connection
with grid inverter in single phased house: your solar also produces during grid blackout, next1 manages it all. Jump directly to autarky!



Add storage anywhere quickly
with grid inverter + power meter
Have a backup line



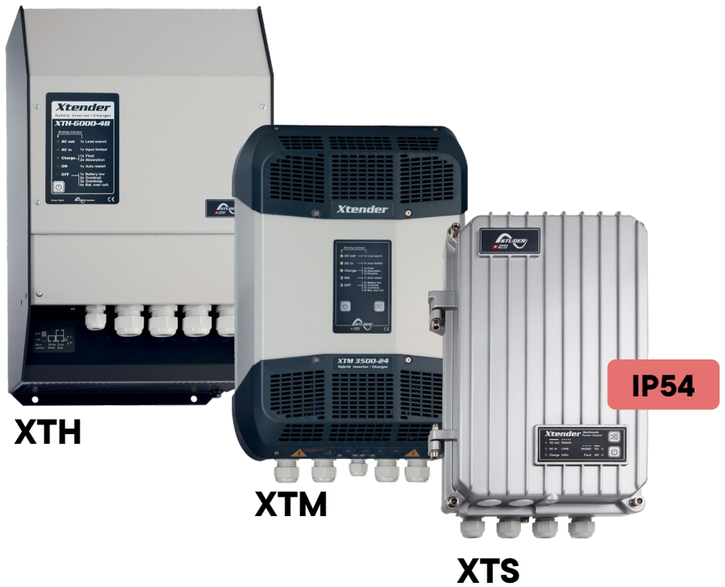
Features
For all conditions: IP65 for the highest reliability, close to nominal power at 35°C.
Sinewave quality with minimal THD
Incredible surge power: cope with any loads, no oversizing.
Wall-mounted version, rack 19” ready
Included 80A transfer switch with double relay for ENS, compatible with modern grid codes.
AC flex smart energy management 50A
Ultra-low self-consumption
Up to 9 units (1, 2 or 3-phase, up to 3 in parallel per phase)
2 digital inputs, 2 analogic inputs, 2 auxiliary outputs
Embedded communication: internet, wifi, webinterface
Open communication with Modbus TCP, 485 for accessories



Xtender

Multifunctional offgrid battery inverter-charger

A single-phase smart inverter-charger with low frequency topology ensuring the highest overload capability and the minimum standby consumption. Available for 12, 24 and 48V batteries.



High overload capacity
3x nominal power

Low consumption
1W in standby mode

Multi-units
Parallel, three-phase, split-phase, up to 9 units (72 kVA)

Distributed minigrid
Scalable configurations for rural electrification

Operating modes
ESS, solar priority, backup, UPS, peak-shaving, active filtering

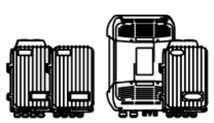
Transfer time
Ultra-fast source connection/disconnection (0-15ms)

Solar AC and DC
AC-coupling of solar inverter for new or retrofit of installations. DC-coupling with Studer MPPT solar-charger for best efficiency

Multiple battery technology
Compatible with almost every 48V battery technology. CAN-BMS integrated for lithium batteries. 24V model for traditional lead-acid

Interface
Fully programmable with access to more than 300 settings with RCC

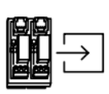
Compatible devices and accessories



vario
solar charge controller

ecf 01
Cooling fan for xts

xconnect
Three-phase mounting frame for xth



arm 02
EExternal auxiliary contacts
mmodule for xts and xtm

rcm 10
RRemote control module for xts and xtm

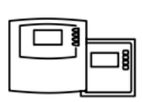
Advanced battery accessories

bts 01
Temperature sensor

bsp
Advanced battery processor (lead-acid)

xcom CAN
Communication with lithium BMS

Display, datalogger, monitoring and communication



rcc 02/03
Configuration, display, datalogger

xcom LAN/GSM
Remote monitoring (Portal & App)

xcom 232i/CAN/485i
Communication bridges (openstuder)

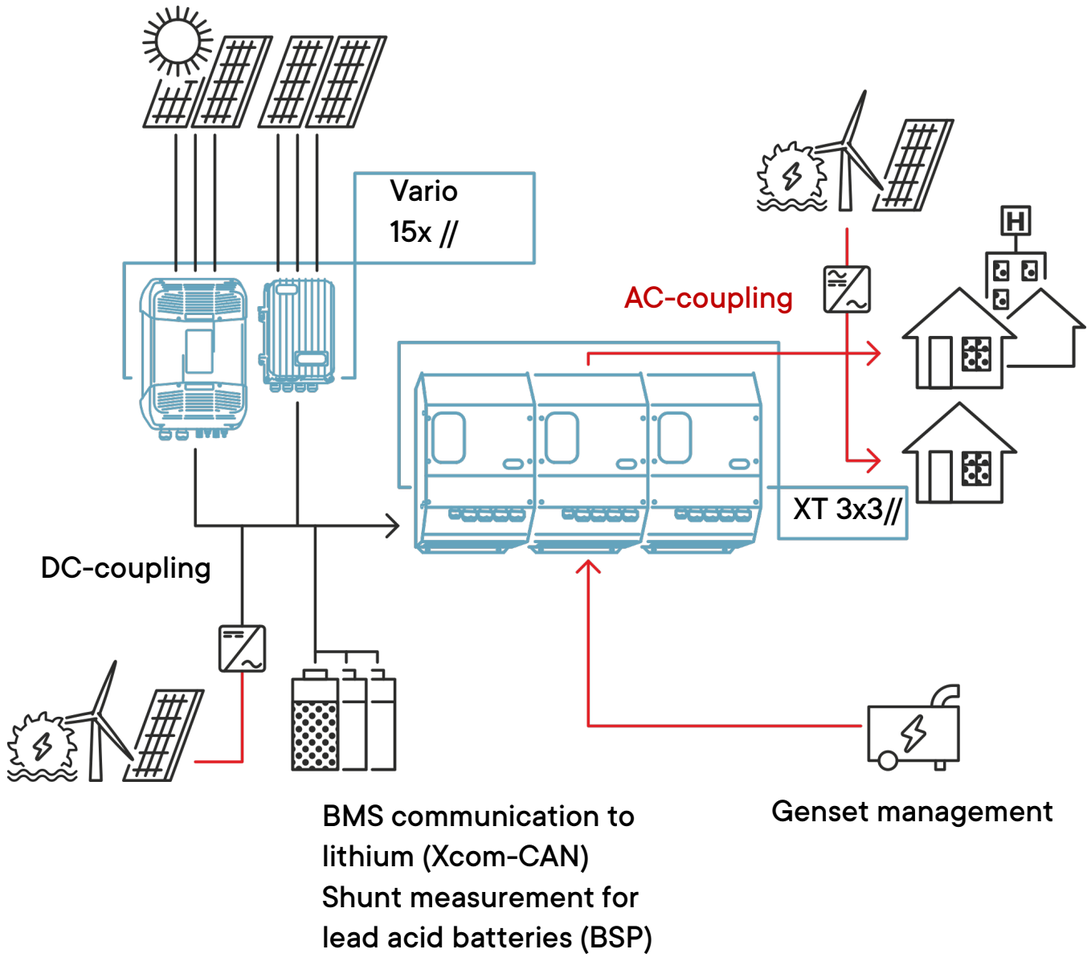
More information

studer-innotec.com/products/#xtender
Page product including technical specifications.
Visit the downloads section for additional documents (datasheet, manual)

Offgrid and solar backup

The Xtender is the best choice from simple hybrid systems to large multi-units systems, proven by thousands of systems in operation worldwide!

It works as a fully integrated system with the solar MPPTs of the Vario series and multiple accessories.



72kW hybrid offgrid system in South Africa

Powering huts of the Swiss Alpine Club

Vario

Low voltage (Variotrack) and high voltage (Variostring) MPPT solar charge controllers

A range of solar chargers able to cope with any solar modules configurations.

IP54

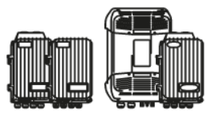
VT 40-145

VT 65-175 **VT 80-175**

VS 70 **VS 120**

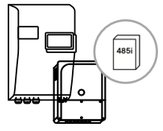
NEW!
With updated voltage to 175V

Compatible devices and accessories

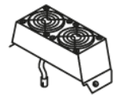


vario
solar charge controller

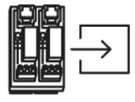
xtender
battery inverter



next
with xcom485i



ecf 01
Cooling fan for xts



arm 02
(ternal auxiliary contacts module

More information

studer-innotec.com/products/#vario
Page product including technical specifications.
Visit the downloads section for additional documents (datasheet, manual)

Build systems
Up to 15 Variotrack/Variostring in parallel on the same communication bus (105kW/180kW) , compatible with Xtenders. Up to 5 with the Next inverter ranges

Design flexibility
Variotrack: low voltage PV up to 145V/175V
Variostring: high voltage PV up to 900V, save installation costs.

Low internal consumption
<1W in nighttime mode

Hydro & wind
Suitable for any DC input voltage

Open configuration
Fully programmable charging curve and PV algorithm

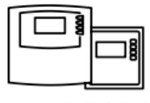
Advanced battery accessories

bts 01
Temperature sensor

bsp
Advanced battery processor (lead-acid)

xcom CAN
Communication with lithium BMS

Display, datalogger, monitoring and communication



rcc 02/03
Configuration, display, datalogger

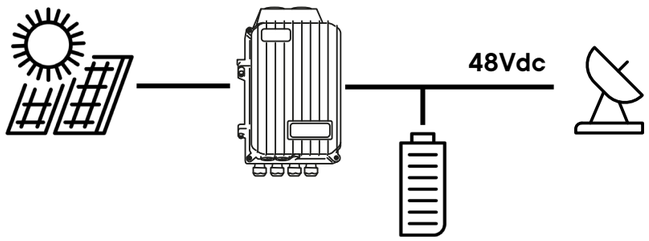
xcom LAN/GSM
Remote monitoring (Portal & App)

xcom 232i/CAN/485i
Communication bridges (openstuder)

Versatile solar MPPT charge controllers

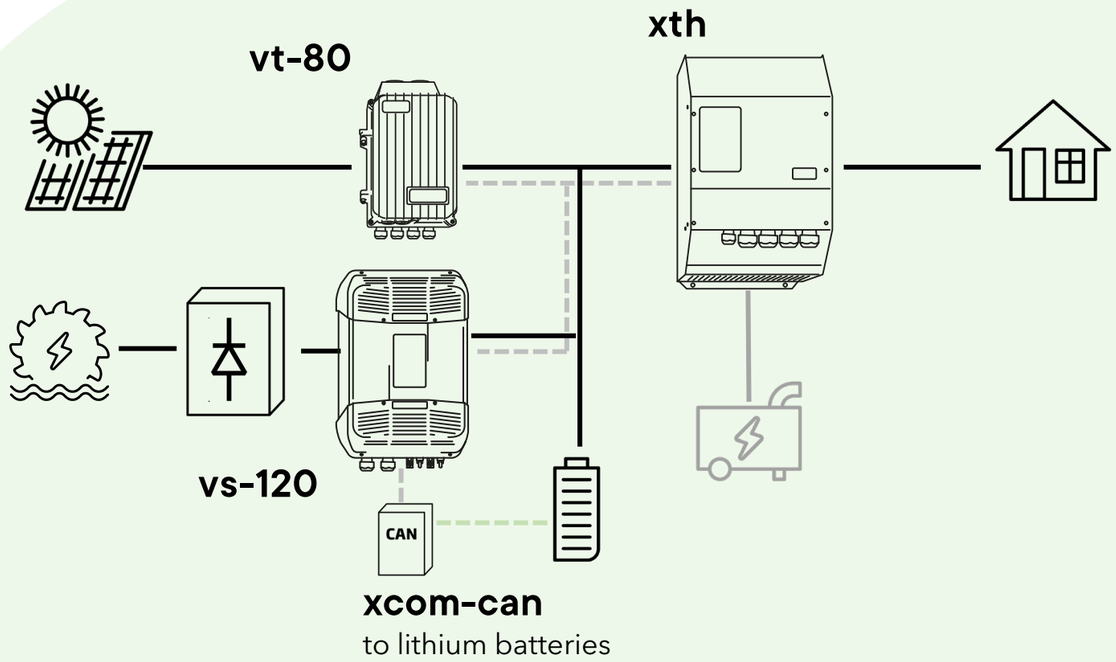
The Variotrack and the Variostring work together with Xtender, Next1 or Next3s to build integrated solar systems.

It can work very well alone in purely 48V system like in telecom applications.



Itelazpi offgrid telecom tower, Spain

Cabane des Audannes: an appreciated trekking destination in the Alps, powered by solar and pico-hydro with a Studer system



The Vario chargers have been used in standard solar systems as well as in special applications (pico-hydro, DC/DC converters, DC-minigrids) thanks to their flexibility in programming.

AJ

Reliable and compact for your small to medium sized system

The AJ series pure sinewave inverters convert battery voltage into high quality 230/120Vac which can be used for all electrical appliances.
Highly demanded for large electrification project due to its long track record of reliability.

Range overview

4 sizes of enclosure, all with each 3 standard battery voltage of 12/24/48 V and with a PWM solar charger in option.

	AJ 275-400	AJ 500-700	AJ 1000-1300	AJ 2100-2400
Nominal battery voltage	12/24/48 Vdc		12/24 Vdc	
Continuous power 25°C	200 – 300 VA	400 – 500 VA	800 – 1000 VA	2000 VA
Power 30 min. 25°C	275 – 400 VA	500 – 700 VA	1000 – 1300 VA	2100 – 2400 VA
Power 5 sec. 25°C	450 – 1000 VA	1000 – 1400 VA	2200 – 2800 VA	5000 – 5200 VA
Output voltage frequency	sine wave 230 Vac (120 Vac*) ±5% 50 Hz (60 Hz*) ± 0.05 % (crystal controlled)			
Weight	2.4 - 2.6 kg	4.5 kg	8.5 kg	18 - 19 kg
Dimensions h/w/l	142/163/84 mm	142/240/84 mm	142/428/84 mm	273/399/117 mm
Ingress Protection	IP 30			IP 20
Remote control	rcm01/02/03		jt8	

High overload capabilities
2.5 times the nominal power Pnom

Low internal consumption
<1W in standby mode, low consumption ON with LF topology

Battery Lifetime Optimization
BLO function protects battery aging

Make the job
Pure sinewave, supply to any type of appliance, full internal protection, robust and proven

Plug and play
Supplied with DC and AC cables, ready to be installed

Offroad
200% offgrid, perfect for rural electrification and mobile applications

Available in a large range with many options

version s
Integrated solar charger

version 01
AC out 120Vac & 60Hz

version 02
AC out 120Vac & 50Hz

version 03
AC out 220Vac & 60Hz

version rcm01
Start up when contact closed

version rcm02
Start up when voltage preser

version rcm03
Start up when contact oper

jt8
remote control

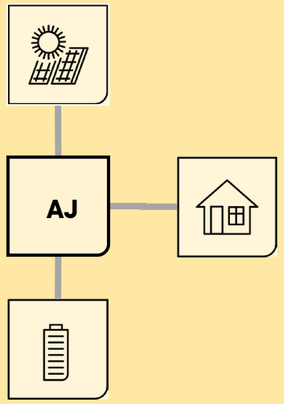
More information

studer-innotec.com/products/#aj
Product page including technical specifications.
Visit the downloads section for additional documents (datasheet, manual)

AC Home

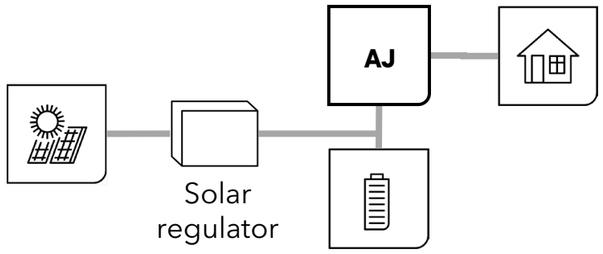
Solar Home Systems (SHS) play a crucial role in rural electrification by addressing basic needs in areas where access to electricity from the main grid is limited or unavailable. Here are some of the basic needs covered by SHS in rural electrification:

- Lighting
- Communication: phone charging, radios or televisions
- Education: With lighting provided by SHS, children can study after dark, improving educational opportunities and academic performance
- Healthcare: power medical equipment and fridges
- Productivity: powering equipment and machinery
- Water Pumping

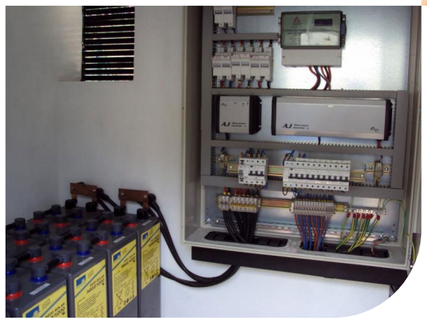


All in one SHS with solar option (-S)

Advantage of AC is the use of commonly available and today efficient AC appliances.



Pure sinewave inverter for houses, mobile applications or specific applications



Water pumping and disinfection

Rural electrification projects

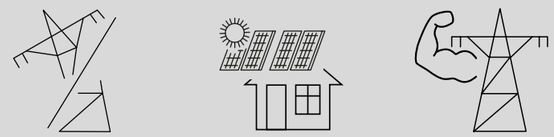
The AJ inverter is recognised and advised by NGO and governments. Not the most modern device but known for its reliability in the field.

Offgrid solutions

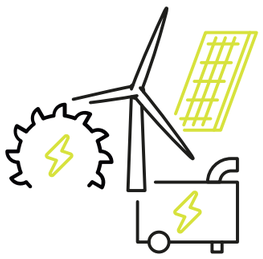
Solar Home Systems, SHS
Hybrid systems
Village electrification, minigrids
Telecom
Mobile applications
- Caravaning
- Leisure vehicles
- Professional vehicle

Ongrid solutions

Enhance your residential or small commercial and industrial system with:
- Self-consumption and Self-sufficiency (autarky)
- Backup – grid blackouts ready
- Extension/retrofit of existing solar
- Grid booster



What can you do with the Studer products?

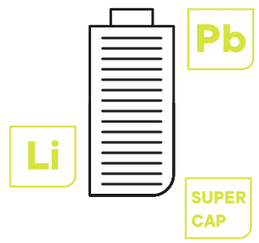


Integrate multiple sources of energy

Full grid interactive

Advanced genset management

Full backup power, devices made for offgrid, no limitation



Ready for all types of batteries.
Compatible with many BMS

We bring solutions to each situation

Unique technical features of Studer inverters, do not hesitate to ask for more

I have a weak grid with a low power connection capacity

Our device performs peak shaving function with the Smart Boost, which means above a given load, the power automatically comes from the battery to compensate. Very useful with underdimensionned grids or limited connections.

My generator doesn't stand asymmetrical loads

The smart phase balancing of the Next3s/Next1 associated with the artificial inertia algorithm guarantee optimal use of genset.

Can you guarantee that your inverter will be able to start my load?

Surge power capacity is a tradition in Studer products. It is very important in offgrid systems to cope with starting loads like motors and transitions. That is where we make a difference! Did you know that asynchronous motors have starting current up to more than 5 times the nominal?

I have a weak grid and I want to have a backup genset

The Next can be configured with two AC sources (grid + genset). The AC-Flex input port can be used for the connexion of a genset as backup. Xtender can also manage two sources with an external ATS.

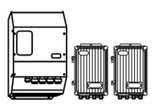
I'm producing on phase1 and consuming on phase2. The balance is zero but my DSO charges for the consumption

The smart phase balancing compensate just what is necessary to minimize your bill. A full grid phase balancing is possible, in that case the power taken on the AC-source is always absolutely symmetrical.

I need larger power than the biggest inverter

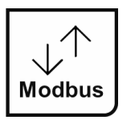
Our Xtender inverter can work in multi-units system 3x parallel and in 3 phases, building systems up to 72kW. The Next3s is a three phased inverter that can work in parallel up to 3 units / 45kW.

I only need 3-phased AC for a small motor; the rest is 1-phased



A system can be asymmetrical in threephased: it is possible to have a strong phase with a large inverter (XTH) and weaker phases with smaller models (XTS). It is also possible to have multiple units on one phase only.

I need an integration in the SCADA system of the building



This is possible with standard communication, MODBUS RTU (Xtender, Next) and MODBUS TCP (Next) with opensource examples and ressources available (GitHub).

I want to perform load shedding with various modes of operations

The Studer inverters have freely programmable contacts and input. This allows for simple automation tasks without external PLC.
The AC-flex of Next series is a monitored connection that can be freely programmed.

My batteries are expensive, how to make them last as long as possible

Intelligent management is in all our products. Algorithms are embedded in all units to control the depth of discharge (DOD), the regular recharge for calibration. See the B.L.O. (Battery Life Optimizer) in AJ and Xtender and adaptative SOC function in Next3s/Next1.

I need to understand what happened in my customer's system

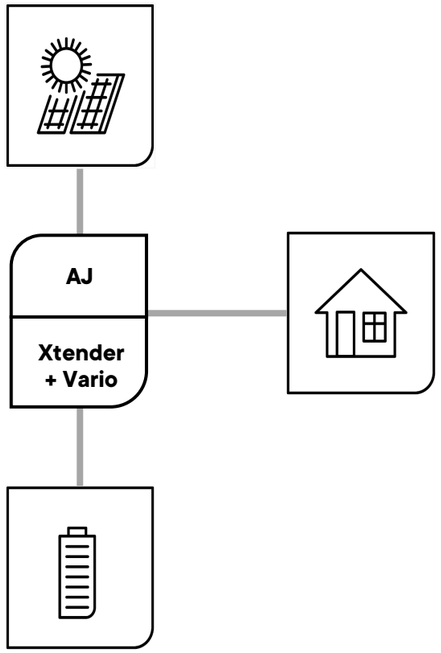
Monitoring tool with advanced technical details is available for the professionals on our webportal. Studer Monitoring App is simpler and more dedicated to the end customer.

More questions? Contact our team
info@studer-innotec.com

Solar home system in
altitude in the Swiss Alps

Offgrid applications

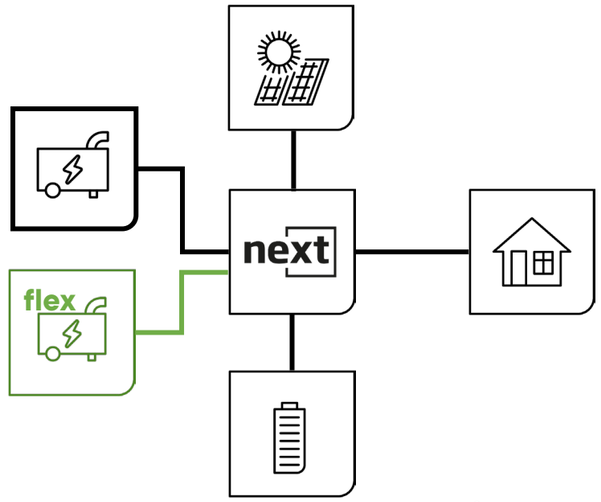
Proven, reproduced thousands of times, reliable



AC Solar Home Systems SHS

SHS power small houses with the basic needs in AC: lights, phone recharge, fridges for food and vaccines in hospitals.

AJ, Xtender and Vario families have been extensively used in rural electrification programs, and they are still today a reference for their reliability and robustness, ensuring the maximum system and battery lifetimes.



Hybrid systems

Use of a genset allows to complement the energy needs in offgrid systems in case of bad weather or high demand. Xtender is able to generate single phase or three phased system up to 72kVA. Similar for the Next1 up to 58kVA. The Next3s is an all in one revolutionary solar hybrid inverter designed to cover all the cases we met in 35 years of experience. 3 Next3s can make systems up to 45kW.

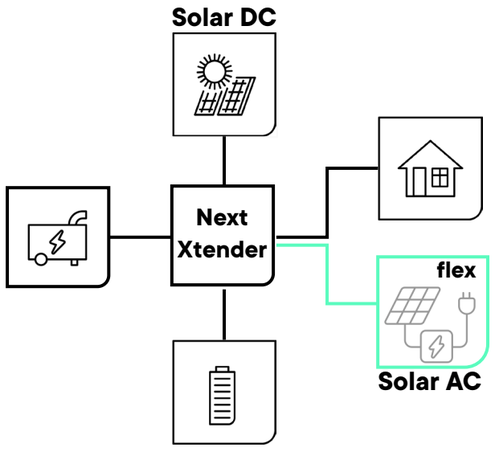
Hybrid systems for a school in Malaysia

The energy access solution of Studer-Innotec was awarded with the Solar Impulse label for efficient solutions. Compared to the traditional use of diesel genset, the hybrid systems allows for a great reduction of fuel use and then reduction of CO2 emission.

System Design: Flexibility is a key point of our products, ask us we have the solution

AC-coupling

The AC-coupling is the principle of using separated battery inverters and PV inverters in the same system. The different elements are connected via the AC lines and therefore the name AC-coupling.
In island mode, the battery inverter (the Next/Xtender) creates the voltage/frequency of the local grid and the solar grid inverters synchronize and connect to that local grid as if they were on the normal grid. In this kind of system, the solar production is directly consumed by the AC loads. With a connection of the PV-inverter to the AC-flex of the Next, this production is fully measured and monitored by the Studer system.

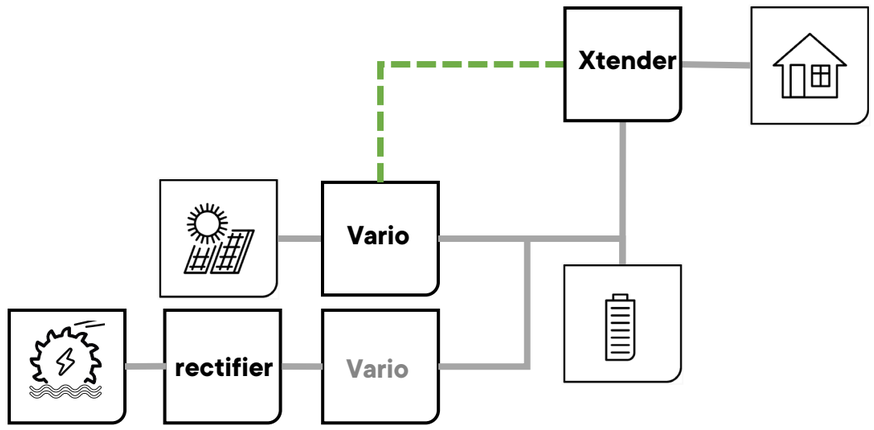


DC+AC-coupling system in South America

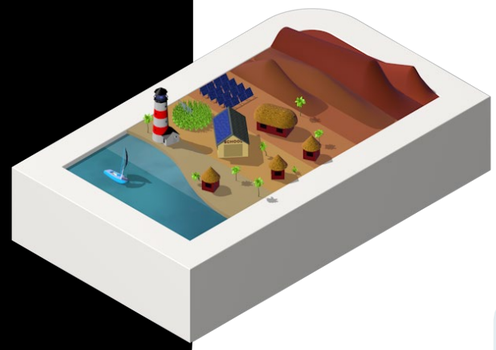
Pico-hydro turbines working with VS and Xtender in Nepal

DC-coupling with multiple sources

Various sources can be easily integrated at the common point of the battery. Variostring has a wide input range for voltage and has been working with various AC generators (synchronous, asynchronous self-excited + rectifier).

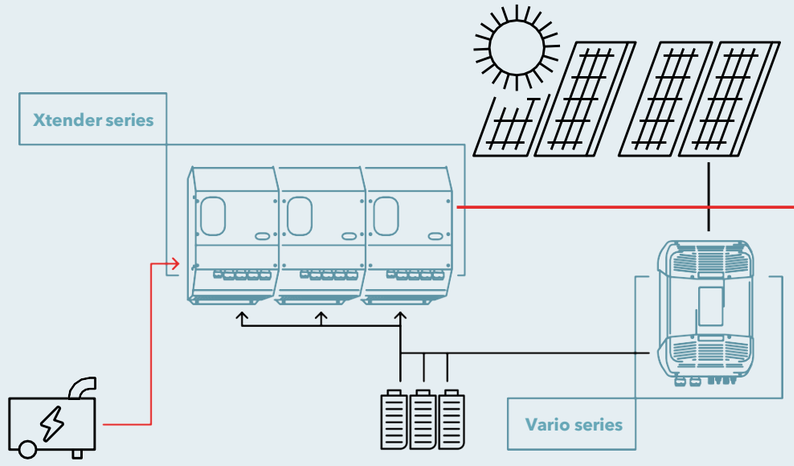


Minigrid for rural electrification



A minigrid is a small island grid working locally.
A centralized energy system creates the grid, and a distribution system reaches the consumers.
Studer Innotec developed a series of functionalities to be the centralized system or be distributed interactive systems coupled by AC.

Central system



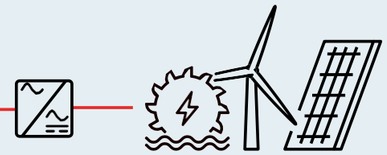
Diesel generator / Mains
AC sources like diesel generators can recharge the batteries during weak renewable production time or peak power consumption in the Minigrid to secure the system. Automatic handling of the Start and Stop by the central **Xtender**.

The system may be connected to a future public grid by this point.

Battery
The advanced battery management system of the **Xtender** and **Vario series** allows to use most types of battery technologies like: AGM, Gel, Flooded Lead-acid, NiCad, NiFe, Redox Flow or Lithium.

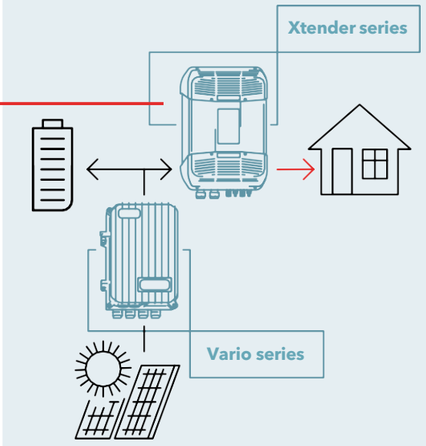
Monitoring
Different types of monitoring are possible:

- **RCC 02/03** remote control unit focal on-site monitoring including datalogging and programming.
- **Xcom LAN/GSM** for monitoring and datalogging with internet access.
- **Xcom 232i /CAN** for a communication with an external monitoring device.



Grid feeding

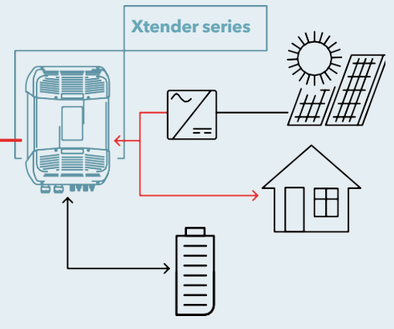
Producer of renewable energy feeding back to the minigrid. Most of grid-tied inverter brands are compatible for this application.



DC Coupling

Back-up system which includes a local solar production. This configuration allows to use in priority the own produced solar energy and to minimize the grid consumption.

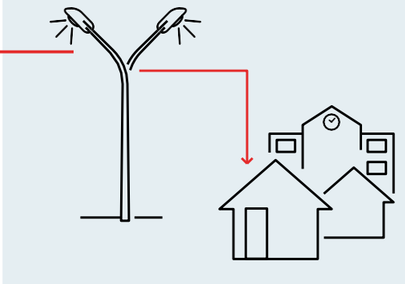
The **Xtender** is automatically managing the energy flow to use a maximum of the local produced solar energy by the **Variotrack** or **Variostring**.



AC Coupling

Local production of solar energy by a grid-tied inverter. This configuration includes a backup function and the solar overproduction is fed back to the minigrid.

The **Xtender** is able to control the grid-tied inverter by frequency shifting and thereby manage the battery charge.

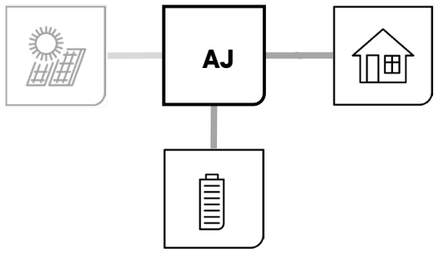


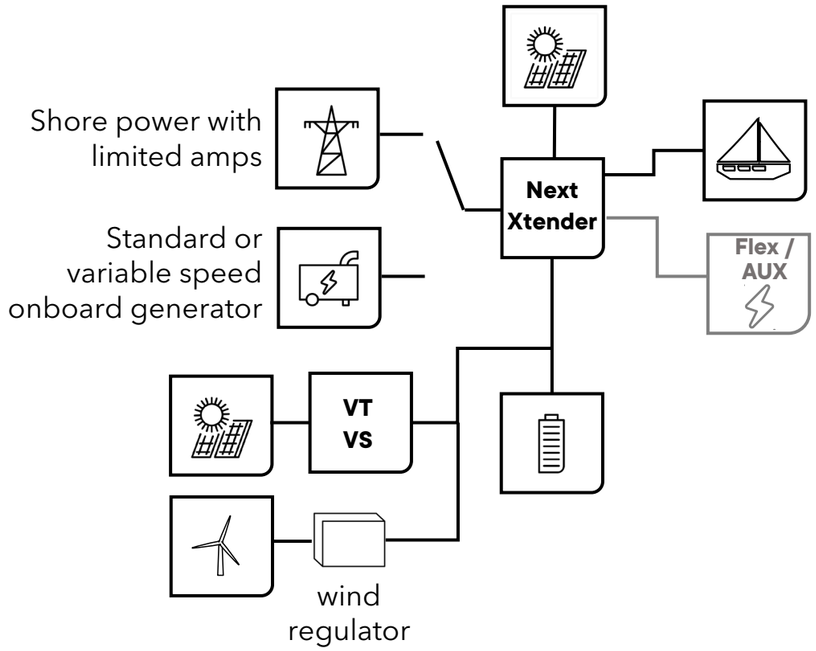
Loads

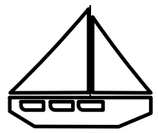
Direct energy consumers of the minigrid, like small households or communal consumers (eg. Streetlights). Typical pay-as-you-go consumer with different tariff scales. Different tariff schemes and management models can be implemented.

Mobile applications

Caravaning with solar power from the roof or direct power from the battery and alternator.





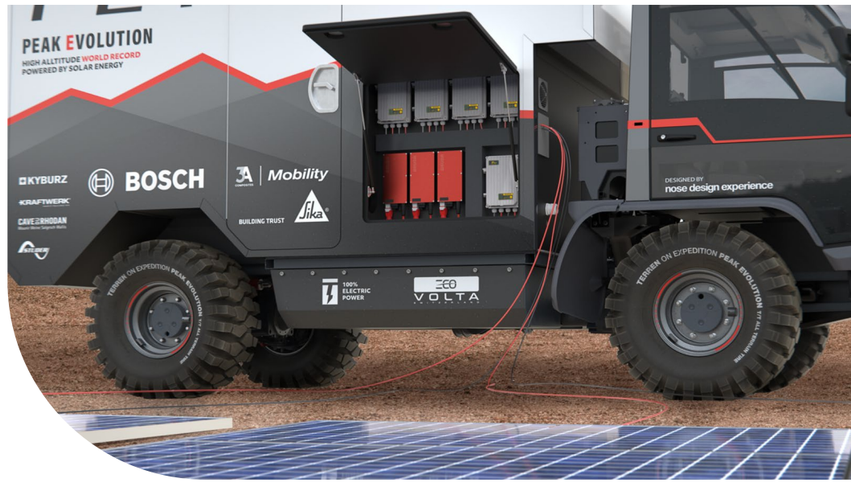


Silent onboard power from batteries for boats. When connected to the pier with limited shore connection the Smart Boost adds power from the battery to supply the loads.

High altitude world record expedition

DPP innovation with its off-road vehicle powered by our vt65 has set a world record in December 2023 for an electrical vehicle by climbing at 6510 meters above sea level in Chile at the Ojos de Salado.

The vehicle incorporates 5 solar charge controllers vt65. We were in contact with the development team during the design of the electric system.

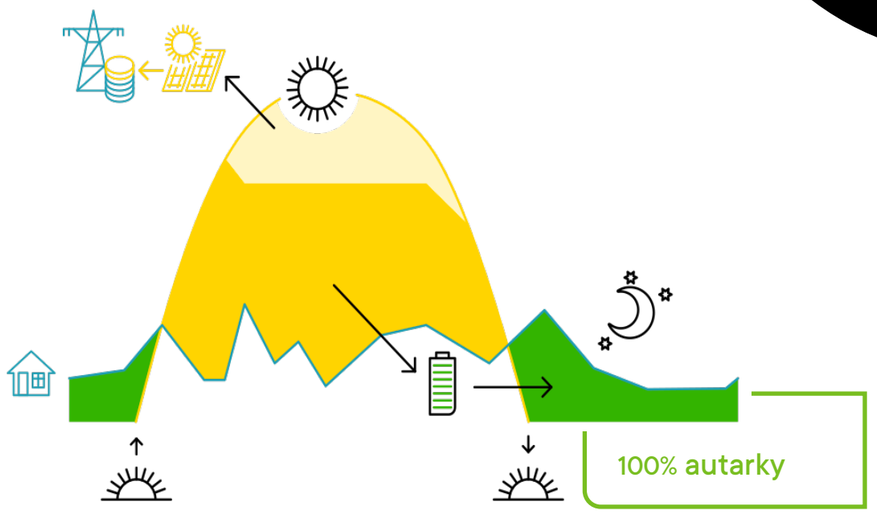


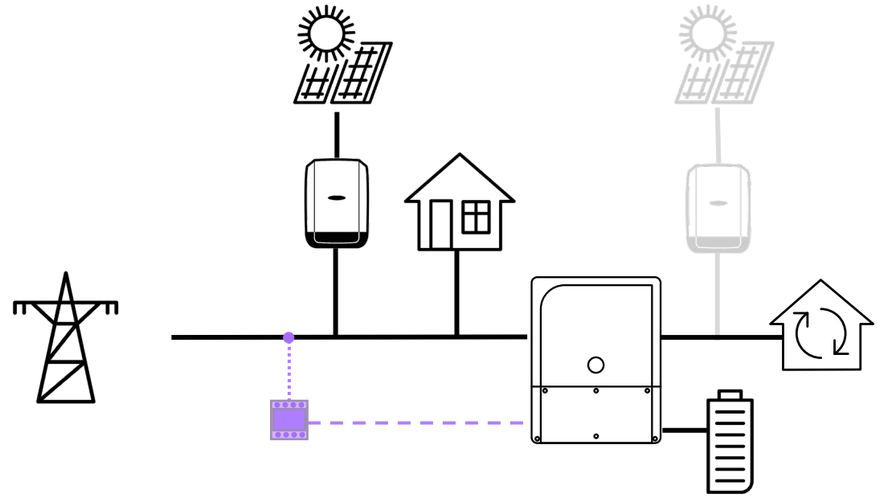
Ongrid applications

The offgrid model to maximize autonomy for grid-tied systems

16kW, 100% offgrid -100% ongrid, why?

The Next3s is a three phased 16kW. It can cope with all the loads of a house at the same time, including an 12kW EV charger. In case of blackout the house can continue to be fully powered in offgrid mode without compromise. AC flex output allows for energy management with loads.

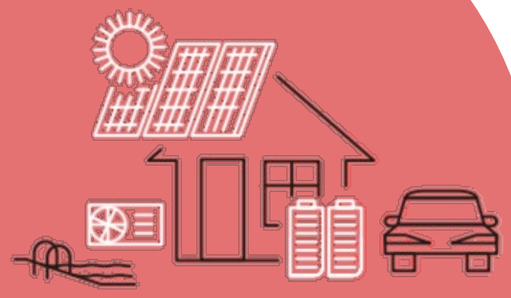


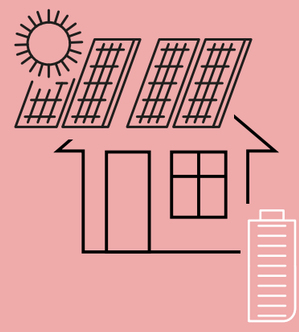


Self-sufficiency

A new approach for solar installations

More than self-consumption, we propose self-sufficiency: storage of solar energy during the day, supply of loads with your energy during the night, operation in case of grid failure. A step towards energy autarky. Install a Next3s at the input of your house and it manages it all.





Retrofit

Adding storage on existing grid feeding systems

The Next1 can be added very simply to a system with a power meter measurement on the building introduction. A single-phase the grid inverter can be connected directly on the AC flex port and work in case of grid failure.
The Next3s allows for extension with more solar and storage. It can work with any modern inverter in an AC-coupling scheme. It is placed at the input of the house, manage all the power fluxes.

Special ongrid applications

Smart Energy Management

Develop your own product: you can design your control of the system with the unique opportunity to take full control of the storage. This is enabled with open communication with MODBUS TCP and RTU.

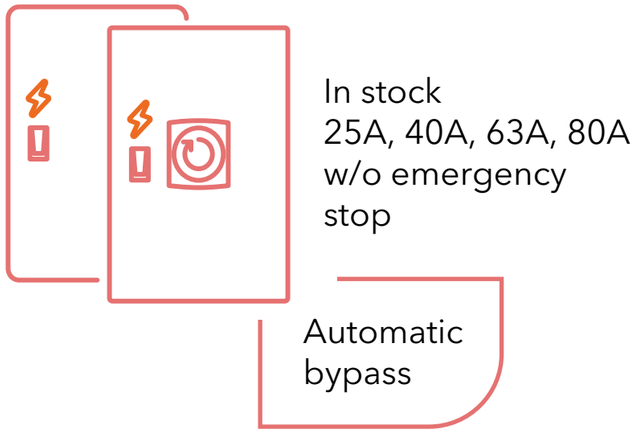
Compatible with existing energy management systems (EMS) like Solar Manager: this opens possibilities to applications such as dynamic pricing control, VPP integration and many more.

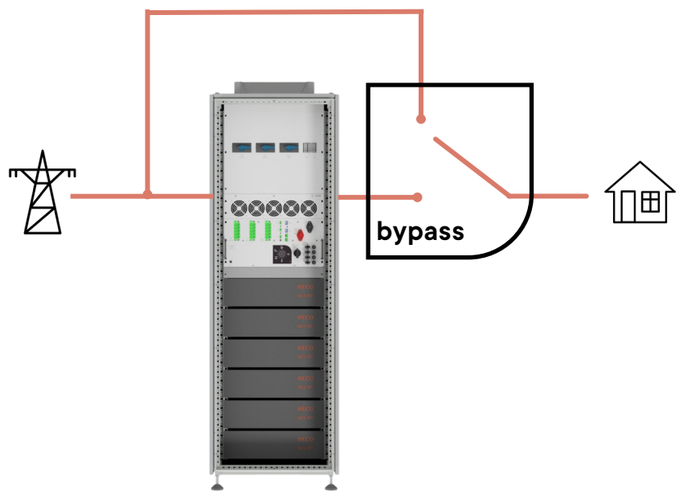
Advanced monitoring

Beyond the nice-looking designs for end customers, our monitoring portal is made for professionals… But yes, we also have the nice looking and simple Studer monitoring app for the end user.

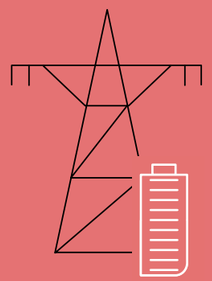
Bypass box

An automatic bypass for servicing the inverter is available in option. Add redundancy to your system!





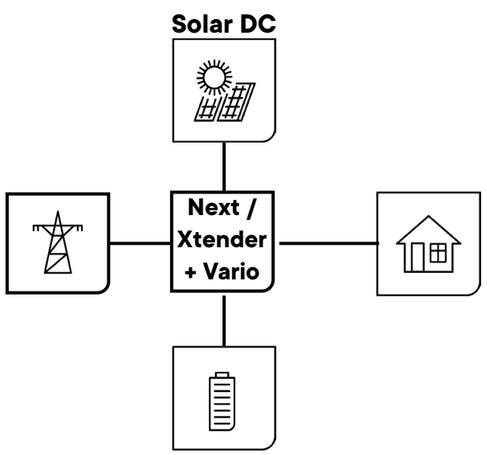
Grid services
Flexibility is one key point of our product: ask us we have the solution

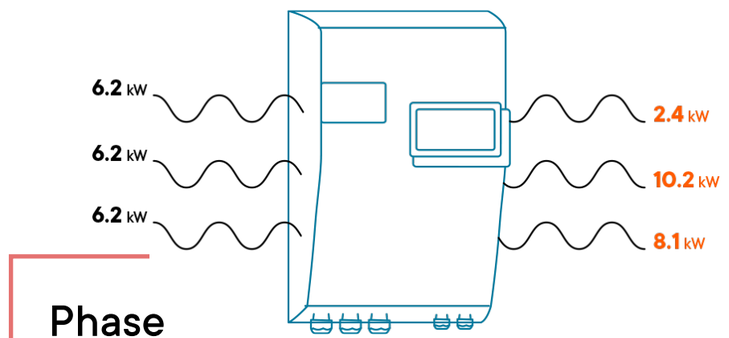


Grid backup

Stay powered with unreliable grids. Solar and batteries give you security.

Kerala is well known for its lush vegetation. It has a wet and maritime tropical climate, influenced by the seasonal heavy rains. During this monsoon period, power failures due to trees falling is common in rural areas. In 2018, monsoon caused floods in Kerala and power failure in most of the rural parts for more than 3 days.



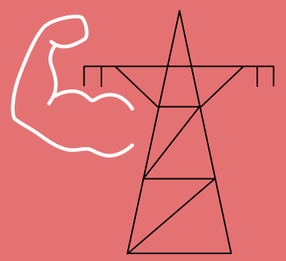


Phase balancing

Solar backup in Kerala, India

The grid can be present but with limited capacity and quality. Our inverter charger can perform:

- **Peak-shaving:** peak power can be compensated automatically by the battery. That allows per example to override the grid connection limitation
- **Quality survey :** the installation can automatically disconnect if the quality is poor
- **Single to three phased supply:** two phases created by the inverters to supply three phased loads (motors)
- **Phase balancing:** limit actively the unbalance and even transfer power from one phase to the other
- **Zero feed-in:** zero grid feeding means that no energy is fed into the power grid. Solar is used for the load and excess goes to the storage, never to the grid
- **Load shifting:** with changing electricity prices during the day, storage allows for a bill optimization. That is good for the economics and for the grid



Grid booster

Stabilize grid with only storage solution (end of line or high renewables penetration)

Next3s rack: integration example

Infra: a complete energy infrastructure in a cabinet

All-in-one plug-and-play energy solution

Next3s rack, smart energy management

Up to 30 kWh of energy storage

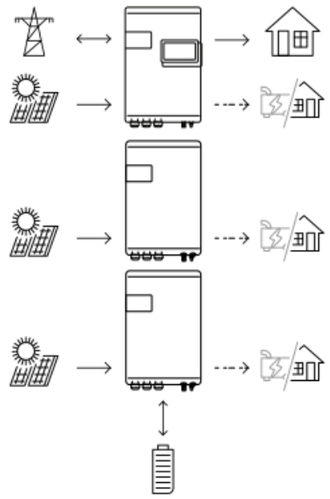
Up to 24 kW built-in solar power with 2 MPPT

Optional bypass, infra outdoor, infra battery

More information

studer-innotec.com/infra

Page product including technical specifications.

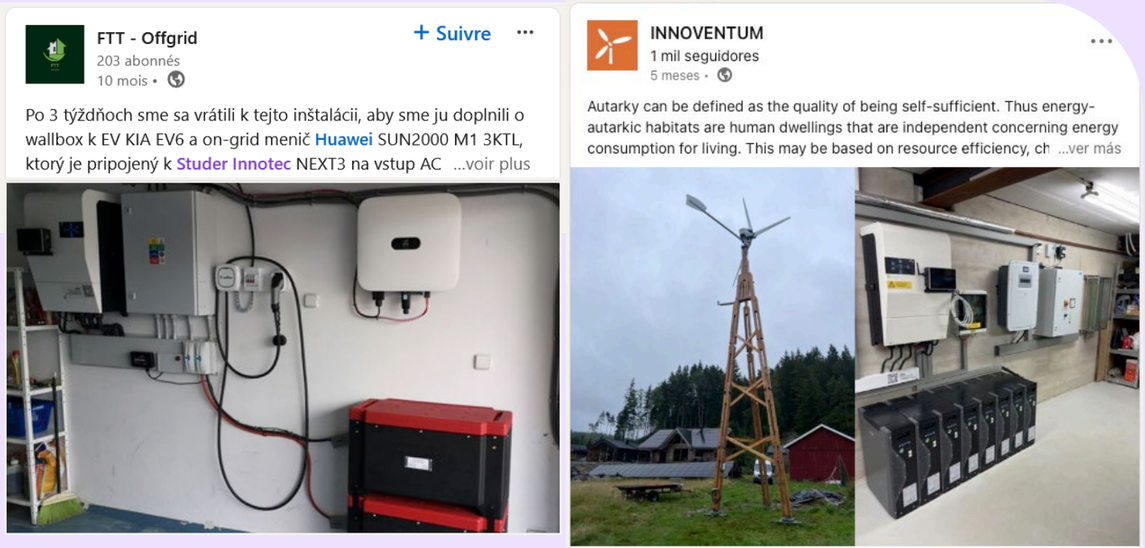


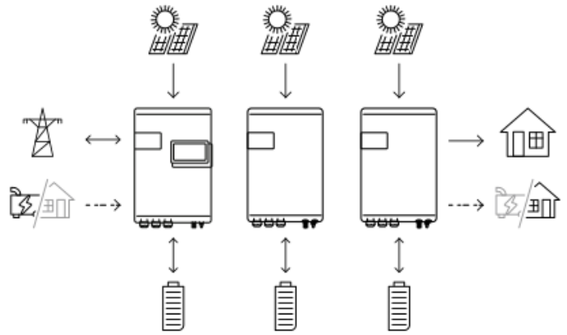
Common battery

Next3s multi-units systems

Up to 3x nx3 in parallel (48 kW)
1 internal transfer 80A (55 kVA), 1nx interface
Separate solar inputs, AC flex, Common AC source, AC loads
Batteries can be separated, possibility to use different technologies and different sizes

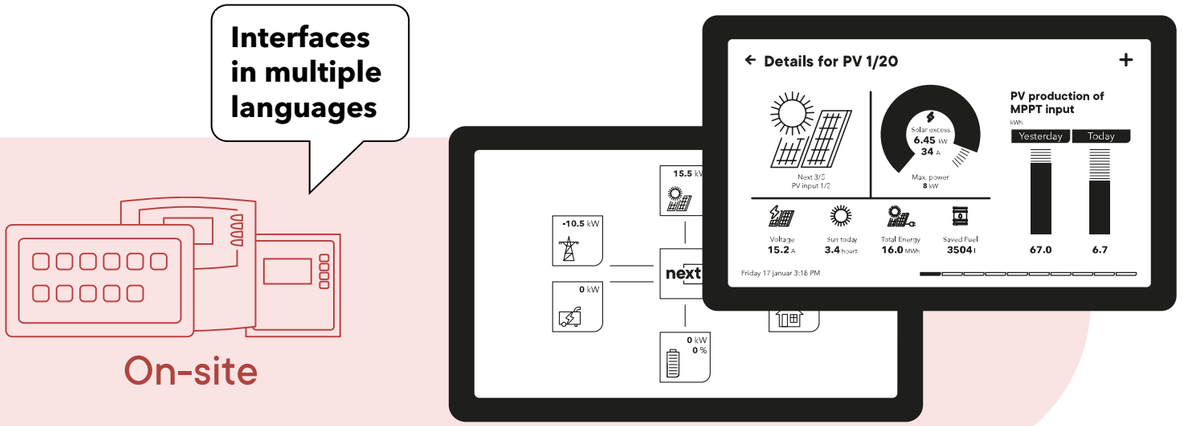
Customers talk about Next3s!





Multi-battery

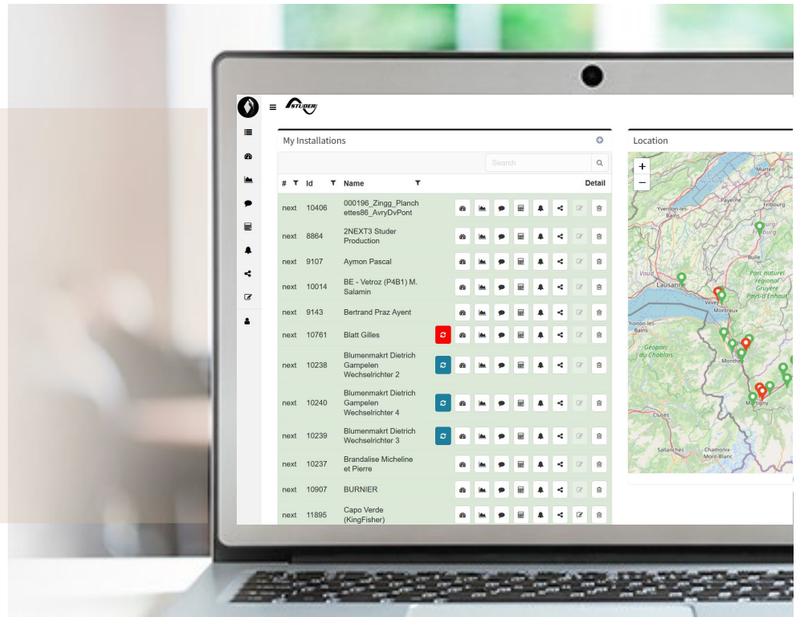
Keep an eye on the system



Monitoring and remote control tools

Today, monitoring a renewable energy system is essential. Our tools provide continuous information (real-time and past behaviour) for a deep understanding of the operation of the system.

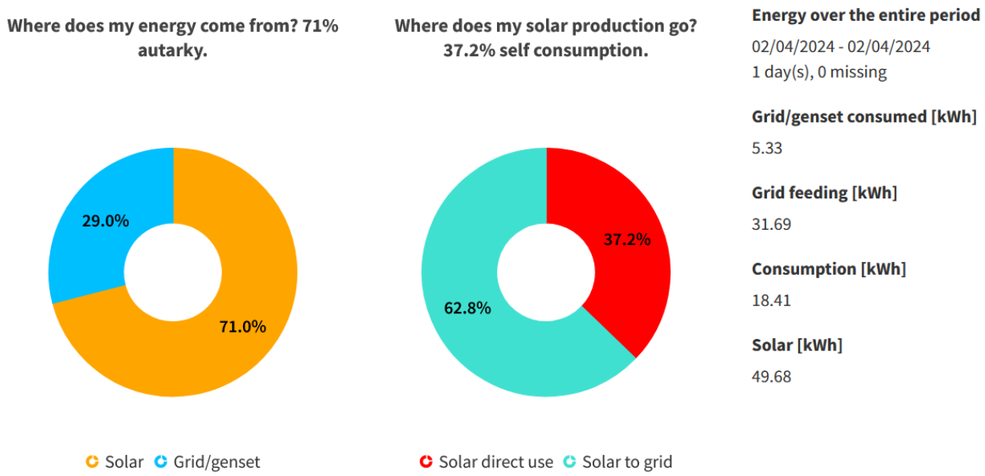
Professional web portal

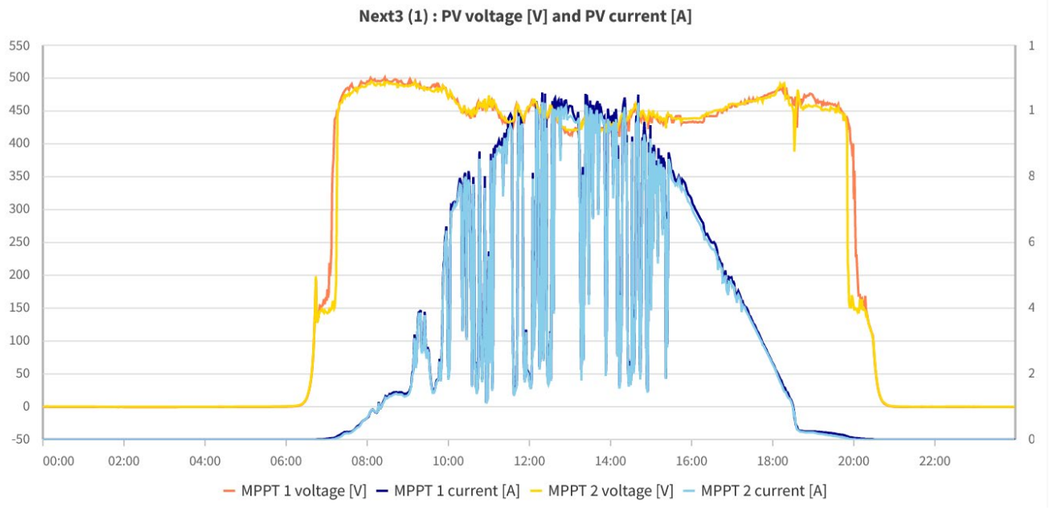


Installation supervision

Tools adapted to all

From comprehensive indicators for the end user to technical details and remote settings management for the professionals, we carefully design our different tools to cope with the different needs of our customers and their end-customers.



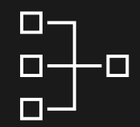


Openstuder

On top of the monitoring tools that are available with our devices, we keep a very open communication philosophy. Using our communication bridges every professional can integrate Studer devices (with full control and information) into an advanced monitoring system.

Open data

- Web API to access data
- Readable csv files with all datas on SD (Xtender/Vario/RCC) or USB stick (next)
- Raw data available on web portal
- Libraries and examples on GitHub

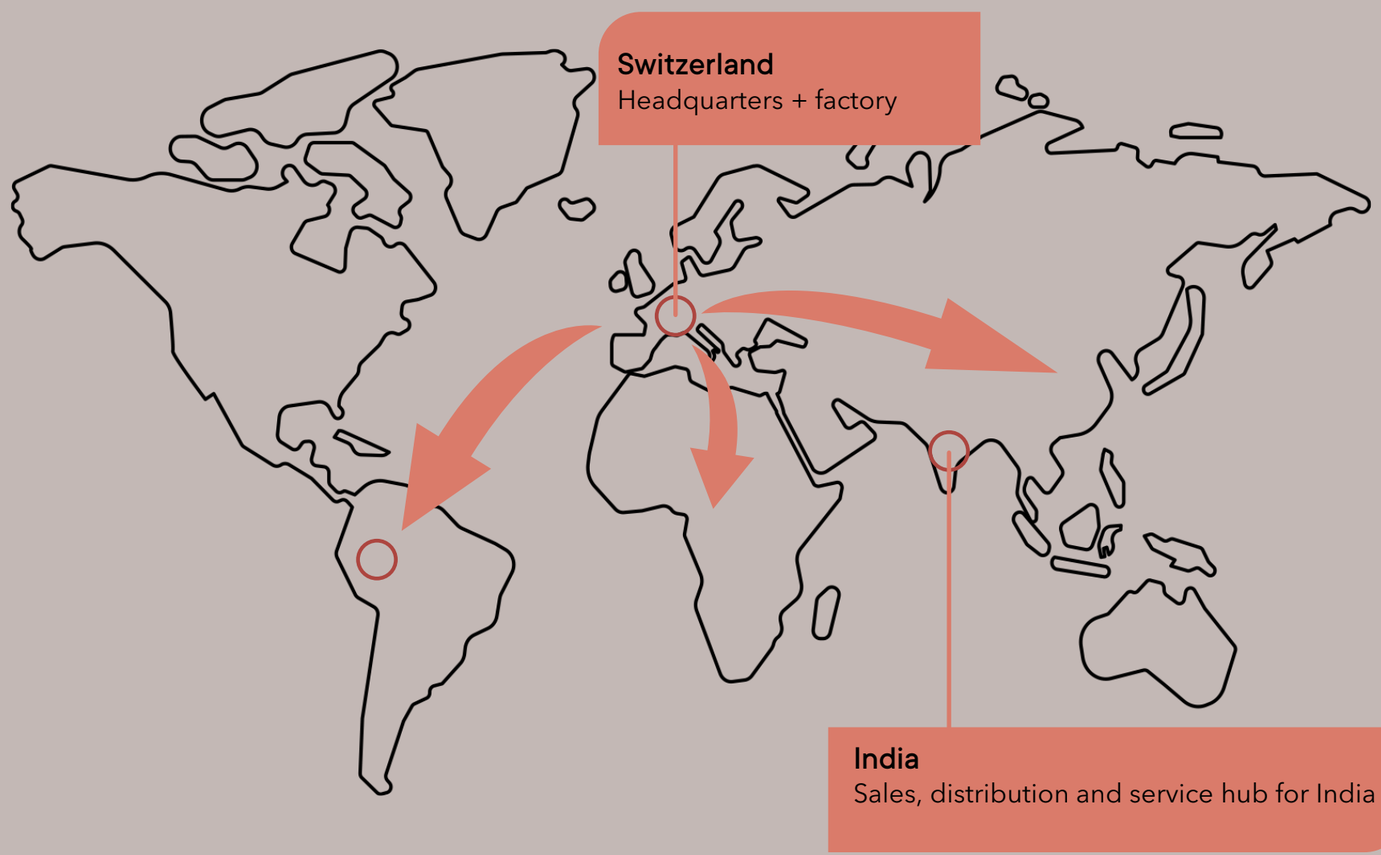


Open protocols for SCADA

- Xtender range: Studer serial RS232 protocol, Studer CAN public protocol, Studer Modbus RTU public protocol
- next range: Studer Modbus RTU & TCP/IP public protocols

Worldwide network

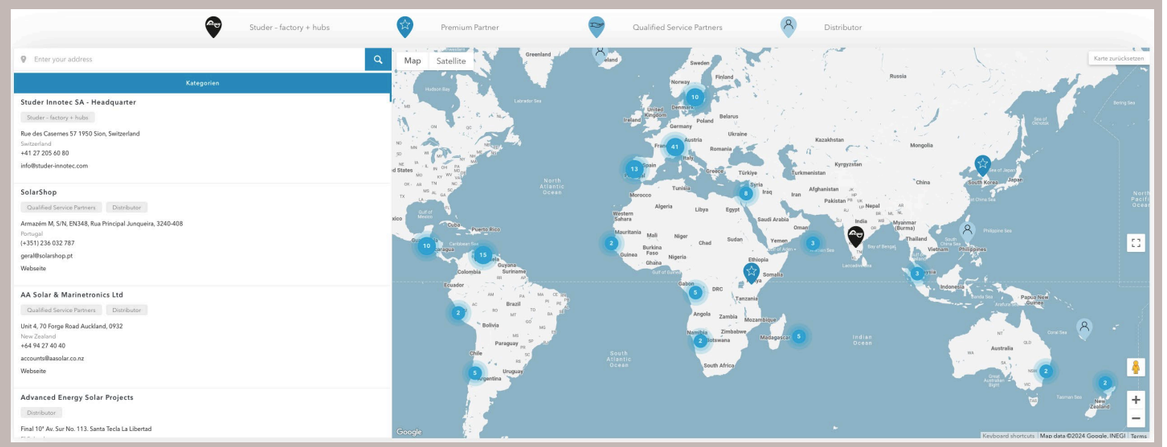
Present in more than 150 countries with a 120+ network of Studer partners



Check our partners map

studer-innotec.com/partners/

Contact us to be part of it…



Compatibility

Studer is committed to continuously extend its products compatibility in order to facilitate the professional integrations of our products into solutions. Check with our team

Batteries

AutarcTech enjoy independence
BAE Reliable Energy
BYD
CEGASA
Discover Innovative Battery Solutions
modual
PYLONTECH
SUNLIGHT POWER IS KNOWLEDGE
WECO
ZYC ENERGY

and more...

Energy Management System EMS

ODYSSEY
SOLAR MANAGER Eigenverbrauch optimieren
DIGITAL LOGIC
AMMP

and more...

Solar inverters in AC-coupling

Fronius
SMA
ENPHASE
KOSTAL

and more...

Support at your service

Dedicated technical service

Our dedicated technical support team assists our professional partners in every aspect related to the pre- and after-sales, trainings and factory visits.

A human contact for each technical questions with specialists. Regular technical formations performed to enhance your knowledge and master energy systems with our products.

After sales: Studer care

Swiss made power guarantees a high reliability. Studer products will benefit not only from the longest warranty period of the market (10-year) but also from additional services to keep your mind at peace.

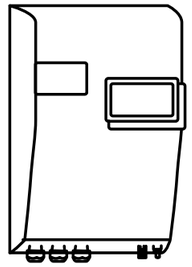
Resources

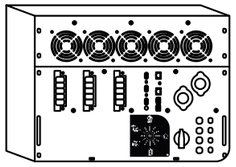
Tech support website with FAQs:
https://support.studer-innotec.com

Meet us: trainings, webinars and expos:
https://studer-innotec.com/expos/

Download all devices manual and datasheets:
https://studer-innotec.com/downloads/

Next3s

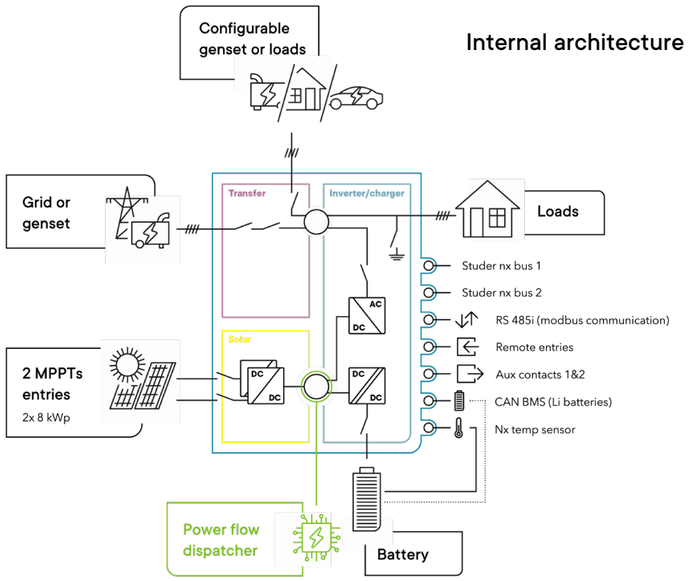


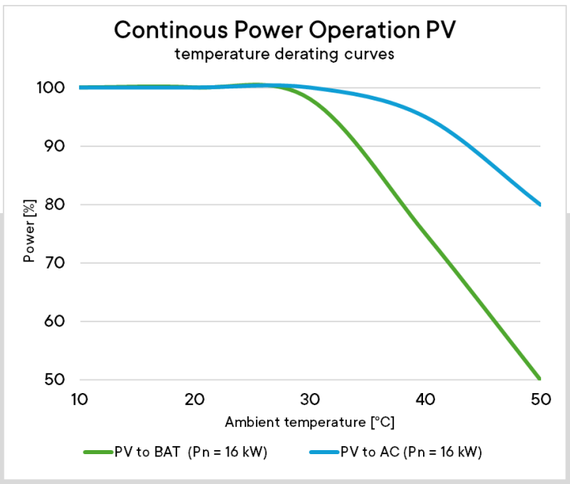


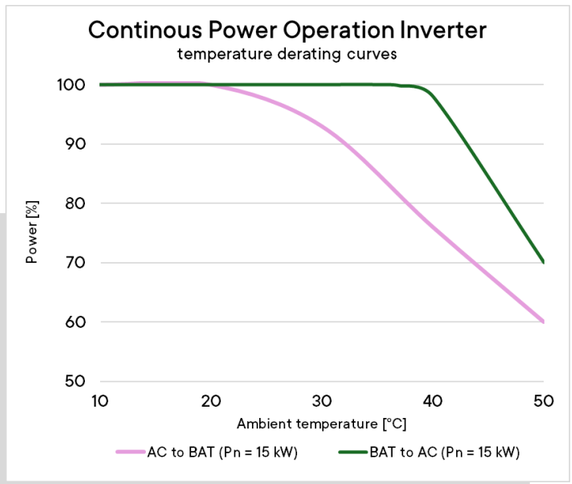
Technical specifications

The Next3s all-in-one smart inverter charger is a 3-phase 16kW inverter with 2 MPPT inputs of 8kW each. There are two versions: wall-mounted and rack. It can be parallelled up to 3 units for 45kW systems

Internal architecture







nx3 16000-48 / nx3 16000-48-rack

Inverter + battery charger

Continuous power 25°C	15000 VA
Power 30 min. 25°C	16000 VA
Power 5 sec. 25°C with solar / inverter / 1-phase	30000 / 24000 / 10000 VA
Nominal output voltage, line to neutral	pure sine wave 220/230/240 Vac (1%)
Nominal output voltage, line to line	pure sine wave 380/400/415
Nominal output frequency	50/60 Hz (0.02%)
Nominal battery voltage (input range)	48Vdc (36-68 Vdc)
Maximum charging current / power	300 Adc/ 15000 W.

Solar PV

Number of MPPT inputs	2
Max PV short circuit current per PV input	27 Adc
Maximum PV open voltage (Voc)	900 Vdc
Start-up voltage / Shut off voltage	200 / 100 Vdc
Maximum solar power produced (electronic limitation)	2x8000W
Maximum solar power recommended (@STC)	2x12000W
MPP voltage range recommended	300 - 700 Vdc

AC source (grid or genset)

Maximum rated current	3*80 Aac
Operating voltage range, line to neutral	176 - 288 Vac
Nominal voltage, line to neutral / line to line	220 - 230 - 240/ 380 - 400 - 415 Vac
Nominal frequency	50/60 Hz
Overvoltage category (OVC), grid code compliance	EU Commission Regulation 2016/631 (NC RfG), EN 50549-1:2019, VDE-ARN 4105:2018, IEC 62116, IEC 61727

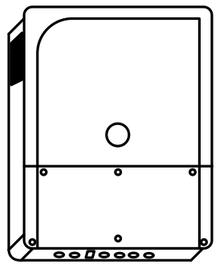
AC flex (source or load)

Maximum rated current	3x80 Aac
Operating voltage range, line to neutral	176 - 288 Vac
Nominal voltage, line to neutral / line to line	220-230-240/380 - 400 - 415 Vac
Nominal frequency	50/60 Hz
Maximum output current	3x102Aac

General data

Product dimensions h/w/l and weight	wall-mounted : 320 / 450 / 760 mm 58 kg rack 19": 350 (8u) / 485 / 675 mm 58 kg
Transport dimensions h/w/l and weight	600 / 800 / 720 mm 72 kg
Selfconsumption OFF / Standby / ON	6 / 7 / 41 W (+5 W with nx interface)
I/O Communications	2 x nx communication bus RJ45/8, 1 x CAN BMS, 1 x R5485i (Modbus), 1 x nx tempSensor
Multifunction I/O contacts	2x Input, 2x Output, rating 16 A each
Interfaces	nx interface, datalogger USB 1-min resolution, 1x RS4851, 1x CANi, 1x LAN, 4x USB, nx wifidongle, studer portal +studer monitoring APP
Safety+EMC conformity (CE marketing)	Low Voltage Directive (LVD) 2014/35/EU, EU Electromagnetic Compliance (EMC) 2014/30/EU

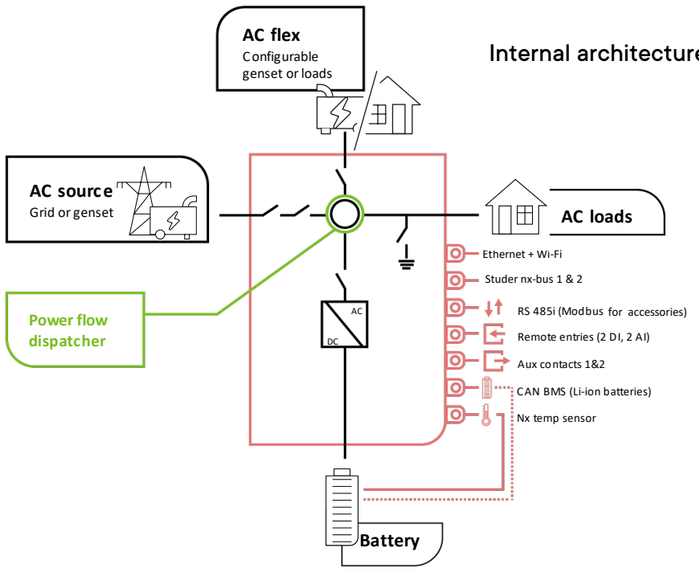
Next1



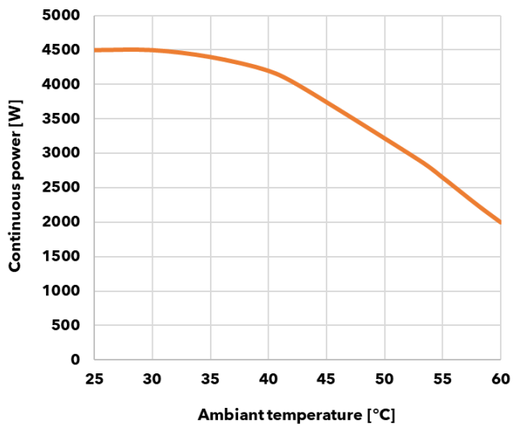
Technical specifications

The Next1 is proposed in 2 models for 48Vdc. Each is available in 230Vac and 120Vac (-US), in wall mounted versions that can be integrated in rack 19“.

Internal architecture



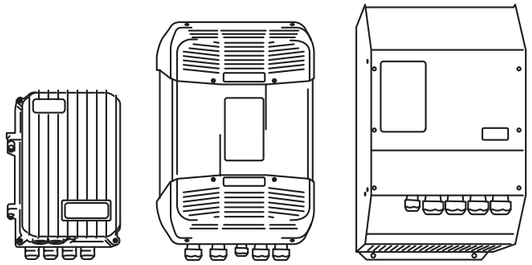
Temperature derating



nx1 6500-48 continuous power
Outstanding behavior up to 60°C

	nx1 6500-48	nx1 4500-48
Inverter + battery charger		
Continuous power 25°C	4500 VA	3400 VA
Power 30 min. 25°C	6500 VA	4500 VA
Power 5 sec. 25°C	12000 VA	10500VA
Nominal output voltage, line to neutral	pure sine wave 220/230/240 Vac (±1%)	
Nominal output frequency	50/60 Hz (±0.02%)	
Battery charger		
Nominal battery voltage (input range)	48Vdc	48 Vdc
Battery input range	38-68 Vdc	38-68 Vdc
Maximum charging current / power	125 Adc/ 6250 W	85Adc/4250W
AC source (grid or genset)		
Maximum rated current	80 Aac	
Operating voltage range, line to neutral	176 - 288 Vac	
Nominal voltage, line to neutral	220 - 230 – 240 Vac	
Nominal frequency	50/60 Hz	
Overvoltage category (OVC)	III	
Grid code compliance	EU Commission Regulation 2016/631 (NC RfG), EN 50549-1:2019, VDE-ARN 4105:2018, IEC 62116, IEC 61727	
AC flex (source or load)		
Maximum rated current	50 Aac	
Operating voltage range, line to neutral	176 - 288 Vac	
Nominal voltage, line to neutral	220-230-240 Vac	
Nominal frequency	50/60 Hz	
General data		
Product dimensions h/w/l	wall-mounted : 182 / 439 / 580 mm rack 19": 175 (3u) / 420 / 550 mm Transport: 275 /495 /630 mm	
Product weight / transport weight	39 kg / 42 kg	36 kg / 39 kg
Multi-units systems	3 units in parallel, three phased, split phase	
Self-consumption OFF / Standby / ON	3 / 7 / 20 W	
Communications	2x nx communication bus RJ45/8, 1x CAN BMS, 1x RS485i	
I/O contacts	2x digital inputs, 2x analogical inputs, 2x Aux Output rated 16A each, , 1x nx tempSensor	
Interfaces	2x USB (datalogger USB 1-min resolution), 1x LAN (Ethernet, Modbus TCP, studer portal + monitoring APP), nx wifidongle, nx-interface with screen in option	
Safety+EMC conformity (CE marketing)	Low Voltage Directive (LVD) 2014/35/EU, EU Electromagnetic Compliance (EMC) 2014/30/EU	
Ingress protection IEC60529	IP65	

Xtender



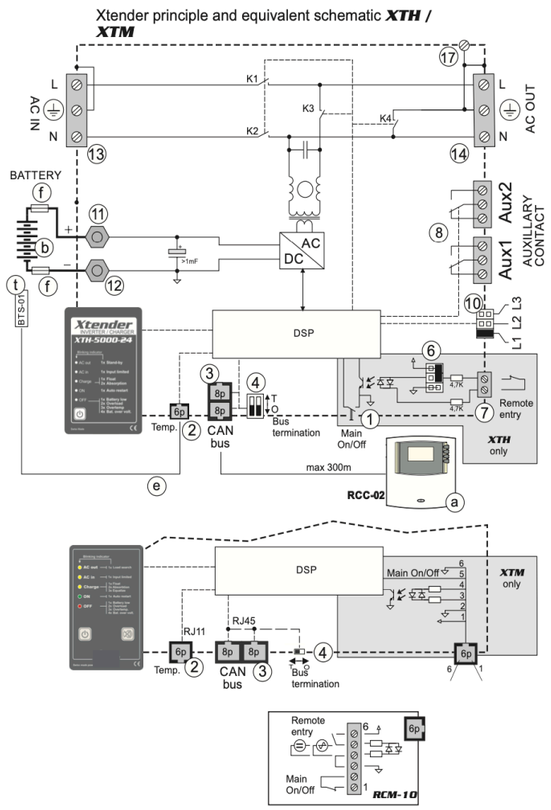
Technical specifications

The Xtender range is divided into 3 sizes: High power XTH, Medium XTM and Small XTS. Each type has the 3 battery voltages of 12, 24, and 48 Vdc. Most of the models are available in 230Vac and 120Vac. It works as an ecosystems with multiple Xtender, Vario chargers and accessories for battery and communication.

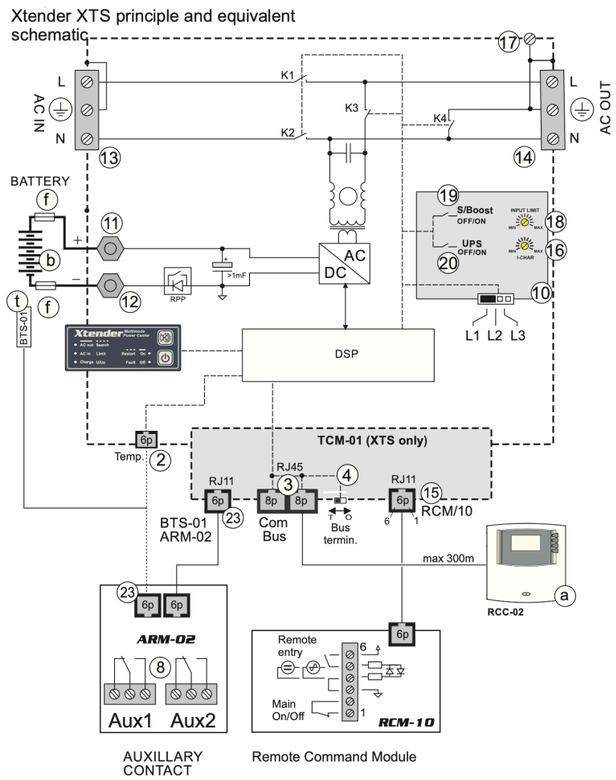
Systems with multi-units and

Multiple Xtender,9 units 3-phases x 3 //: up to 72kVA systems
Multiple Variotrack,15 units: up to75kW of solar
Multiple Variostring,15 units: up to 105 kW of solar

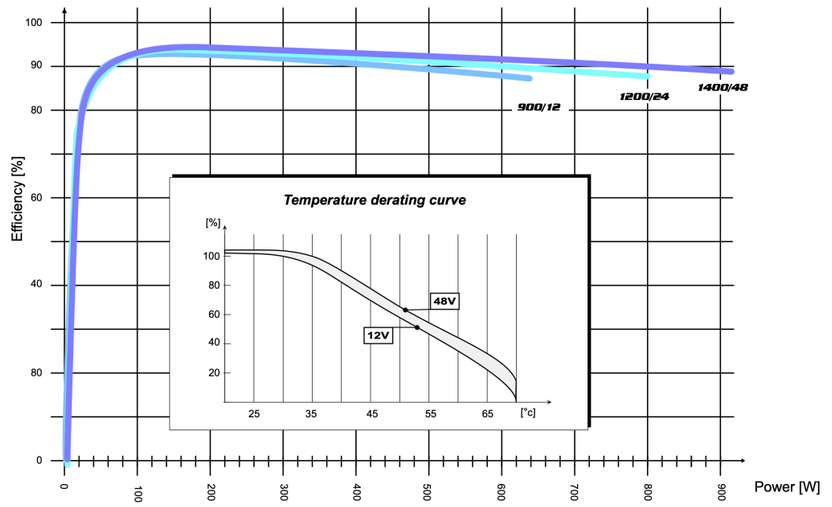
Xtender principle and equivalent schematic ***XTH / XTM***



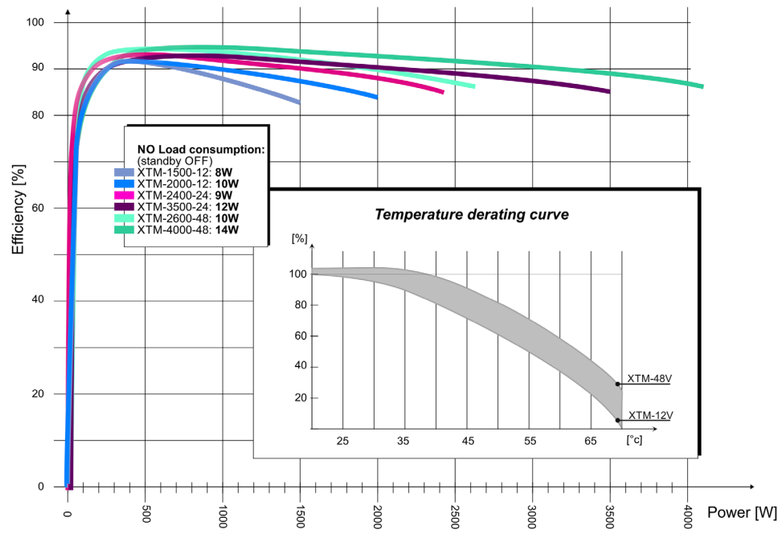
Xtender XTS principle and equivalent schematic



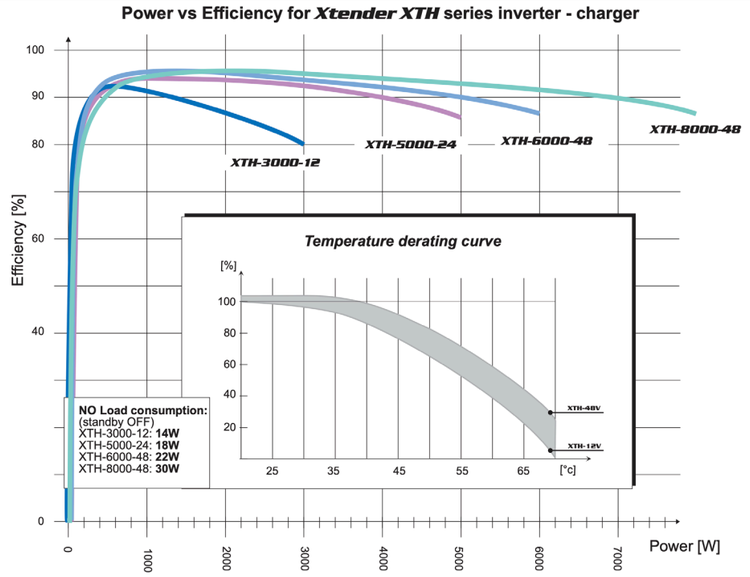
Efficiency curve for ***Xtender XTS*** series inverter - charger



Power vs Efficiency for ***Xtender XTM*** series inverter - charger



Power vs Efficiency for ***Xtender XTH*** series inverter - charger

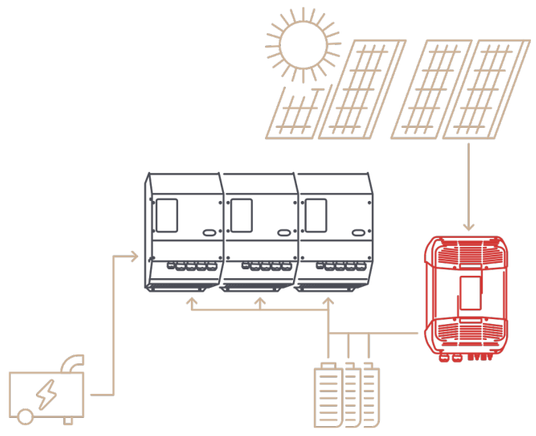


	XTS 900-12	XTS 1200-24	XTS 1400-48	XTM 1500-12	XTM 2000-12	XTM 2400-24	XTM 2600-48	XTM 3500-24	XTM 4000-48	XTH 3000-12	XTH 5000-24	XTH 6000-48	XTH 8000-48
Inverter													
Nominal battery voltage	12 Vdc	24 Vdc	48 Vdc	12 Vdc	12 Vdc	24 Vdc	48 Vdc	24 Vdc	48 Vdc	12 Vdc	24 Vdc	48 Vdc	48 Vdc
Battery input range	9.5 - 17 Vdc	19 - 34 Vdc	38 - 60 Vdc	9.5 - 17 Vdc	9.5 - 17 Vdc	19 - 34 Vdc	38 - 60 Vdc	19 - 34 Vdc	38 - 60 Vdc	9.5 - 17 Vdc	19 - 34 Vdc	38 - 60 Vdc	38 - 60 Vdc
Continuous power 25°C	650[1]/500 VA	800[1]/650 VA	900[1]/750 VA	1500 VA	2000 VA	2000 VA	2000 VA	3000 VA	3500 VA	2500 VA	4500 VA	5000 VA	7000 VA
Power 30 min. 25°C	900[1]/700 VA	1200 [1]/1000 VA	1400[1]/1200 VA	1500 VA	2000 VA	2400 VA	2600 VA	3500 VA	4000 VA	3000 VA	5000 VA	6000 VA	8000 VA
Power 5 sec. 25°C	2.3 kVA	2.5 kVA	2.8kVA	3.4 kVA	4.8 kVA	6 kVA	6.5 kVA	9 kVA	10.5 kVA	7.5 kVA	12 kVA	15 kVA	21 kVA
Maximum efficiency	93%	93%	93%	93%	93%	94%	96%	94%	96%	93%	94%	96%	96%
Output voltage [2]	pure sine wave 230 Vac (± 2%)/120 Vac [3]												
Output frequency [2]	50 Hz ± 0.05% (crystal controlled) 45-65 Hz programmable [3]												
Load detection (stand-by) [2]	2 to 25 W												
Consumption OFF/Stand-by/ON	1.1/1.4/7 W	1.2/1.5/8 W	1.3/1.6/8 W	1.2/1.4/8 W	1.2 /1.4/10 W	1.4/1.6/9 W	1.8/2/10 W	1.4/1.6/12 W	1.8/2.1/14 W	1.2/1.4/14 W	1.4/1.8/18 W	1.8/2.2/22 W	1.8/2.4/30 W
Battery charger													
Maximum charging current [2]	35 A	25 A	12 A	70 A	100 A	55 A	30 A	90 A	50 A	160 A	140 A	100 A	120 A
Transfer													
Input voltage and frequency [2]	150 to 265 Vac /50 to 140 Vac[3] 45 to 65 Hz			150 to 265 Vac /50 to 140 Vac[3] and 45 to 65 Hz						150 to 265 Vac /50 to 140 Vac[3] and 45 to 65 Hz			
Input current max. (transfer relay)/Output current max	16 Aac /20 Aac			50 Aac /56 Aac						50 Aac /56 Aac			50 / 80 Aac
Transfer time	< 15 ms			< 15 ms						< 15 ms			
General data													
Weight	8.2 kg	9 kg	9.3 kg	15 kg	18.5 kg	16.2 kg	16.2 kg	21.2 kg	22.9 kg	34 kg	40 kg	42 kg	46 kg
Dimensions h/w/l	110/210/310 mm			133/322/466 mm						230/300/500 mm			
Conformity	low voltage directive (LVD) 2014/35/EU: EN/IEC 62477-1, 62109-1, 62109-2, 62040-1, electromagnetic compliance (EMC) directive 2014/30/EU: EN/IEC 61000-3-2, 61000-3-3, 61000-6-2, 61000-6-4, 62040-2												
Ingress Protection (IEC60529)	IP54			IP20						IP20			
Multifunction I/O	In opt. 2 AUX relays with ARM-02 In opt. digital input with RCM-10			Included: 2 potential free AUX relays In option: digital input with RCM-10 module						Included: 2 potential free AUX relays 1 digital input			

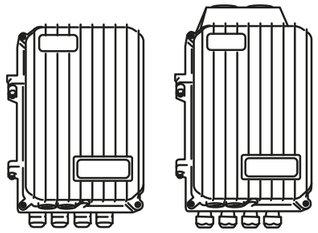
[1] These features are valid only when using the cooling module ecf 01 | [2] Adjustable with the rcc 02/03 | [3] 120 V/60 Hz on request available for all Xtender except xth 8000-48

Functionalities

Fully programmable with RCC, 400 parameters to adapt to any situations
Maximum load up to short-circuit, reduces its voltage after 3 seconds to try to stabilize
Asymmetric load up to pcont.
Cos ϕ 0.1-1 | Harmonic distortion < 2 %
warning before shut-off - with automatic restart
Overload and short-circuit protection automatic disconnection with 3 times restart attempt
Overheat protection
Charge characteristic[2] 6 steps: bulk, absorption, floating, equalization, reduced floating, periodic absorption
Temperature compensation[2] with bts 01 or bsp 500/1200
Correction du facteur de puissance (PFC) EN 61000-3-2



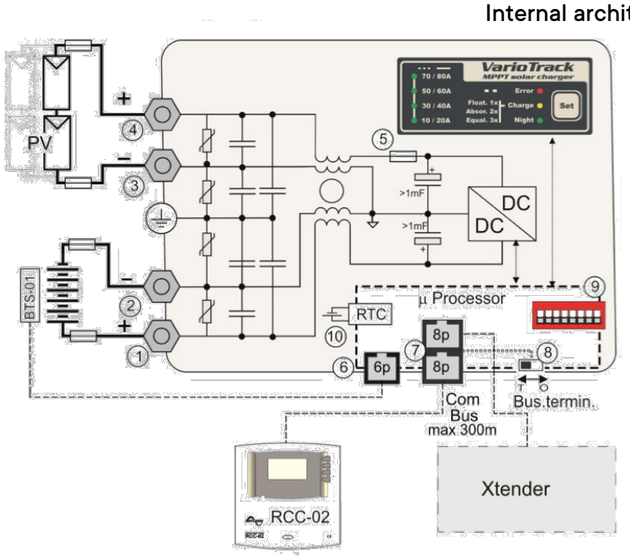
Variotrack



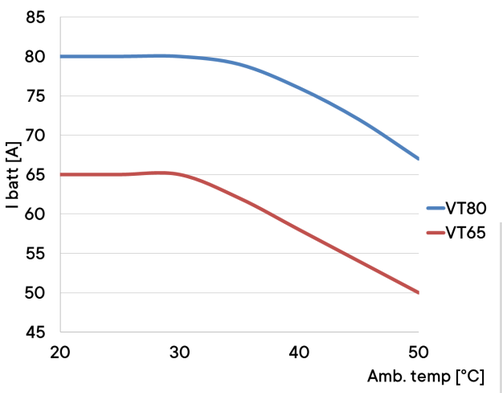
Technical specifications

The Variotrack is the low voltage MPPT solar charge controller for applications with Xtender (direct compatibilty in the communication bus) and the Next3s/Next1 (in combination with the xcom 485i communication gateway).

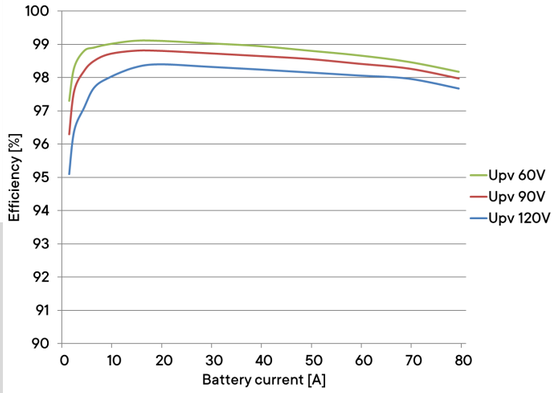
Internal architecture



Variotrack ambiant temperature derating



VarioTrack efficiency with 48V battery



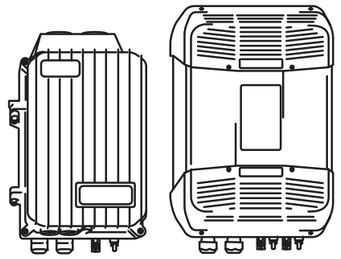
Efficiency and temperature derating curves

	VT-40-145			VT-65-175			VT-80-175		
Battery voltage	One model for all battery voltage Automatic/manual selection of nominal operation to 12/24/48 Vdc								
Battery voltage input range	7 - 68 V								
Battery charger									
Nominal battery voltage	12 V	24 V	48 V	12 V	24 V	48 V	12 V	24 V	48 V
Max. output current		40 A			65 A			80 A	
Operating battery voltage range	7-18V	16-32V	36-68V	7-18V	16-32V	36-68V	7-18V	16-32V	36-68V
Solar PV									
Max. solar power recom (@STC)	625 W	1250 W	2500 W	1000 W	2000 W	4000 W	1250 W	2500 W	5000 W
Maximum current PV		35 A			60 A			75 A	
Max. solar open circuit voltage	80 Vdc	145 Vdc	145 Vdc	80 Vdc	150 Vdc	175 Vdc	80 Vdc	150 Vdc	175 Vdc
Max. solar functional circuit voltage	75 Vdc	145 Vdc	145 Vdc	75 Vdc	150 Vdc	175 Vdc	75 Vdc	150 Vdc	175 Vdc
Min operating solar PV voltage	above the battery voltage								
European weighted efficiecny	>97%								
Tracking efficiency	>99%								
Options									
Cooling fan ecf 01	-			in option, increase current to 80A nominal			included		
General data									
Weight	3.6 kg			5.2 kg			5.5 kg		
Dimensions h/w/l	120 / 220 / 310 mm			120 / 220 / 310 mm			120 / 220 / 350 mm		
Max. standby consumption	< 35mA (0.5 W)	<30mA (0.8 W)	< 25mA (1.2 W)	< 35mA (0.5 W)	<30mA (0.8 W)	< 25mA (1.2 W)	< 35mA (0.5 W)	< 30mA (0.8 W)	< 25mA (1.2 W)
Conformity	low voltage directive (LVD) 2014/35/EU, 62109-1, electromagnetic compliance (EMC) directive 2014/30/EU, 61000-3-3, 61000-6-2, 61000-6-4								
Ingress Protection IEC60529	IP54								
Mounting location	indoor, outdoor								
Operating temperature range	-20 to 55°C								
Relative humidity	100 % (non-condensing)								
Max. wire size/cable	glands 35mm2/M20x1.5								

Max PV installed power (Watt-peak)

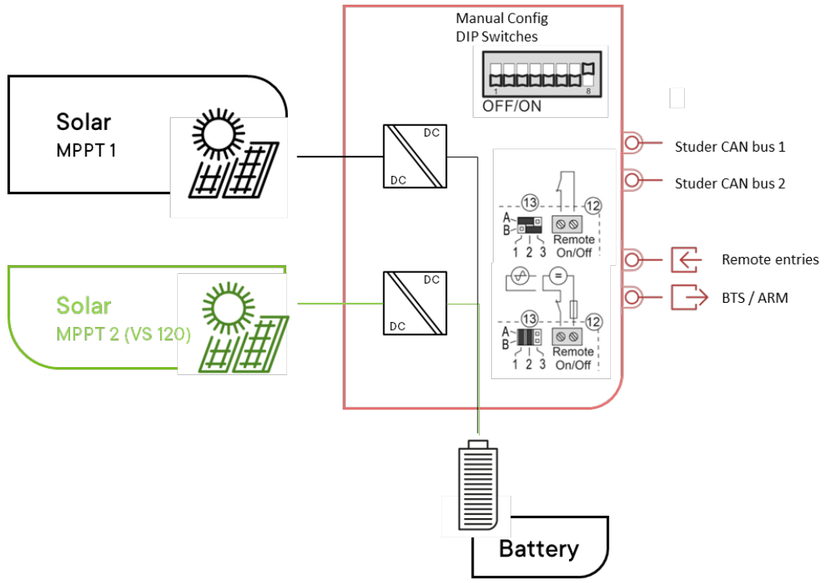
	12 V	24 V	48 V
VT-40	500 Wp	1000 Wp	2000 Wp
VT-65	1000 Wp	2000 Wp	4000 Wp
VT-80	1250 Wp	2500 Wp	5000 Wp
Voc max	<80V	<150V	<150V

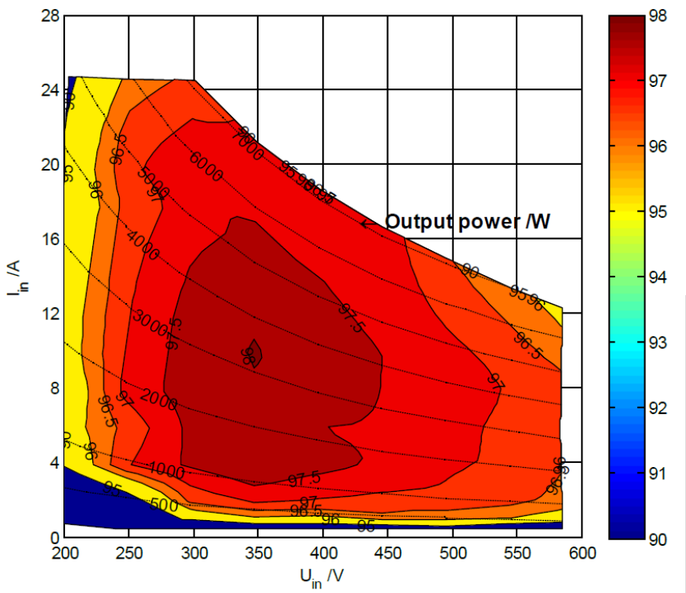
Variostring



Technical specifications

The Variostring is the high voltage MPPT solar charge controller for applications in 48V with Xtender (direct compatilibilty in the communication bus) and with the next (in combination with the xcom 485i communication gateway).



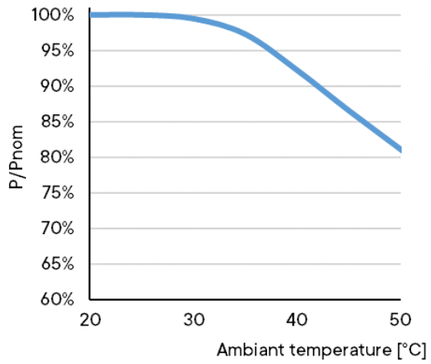


Measured Efficiency by university of applied science western Switzerland

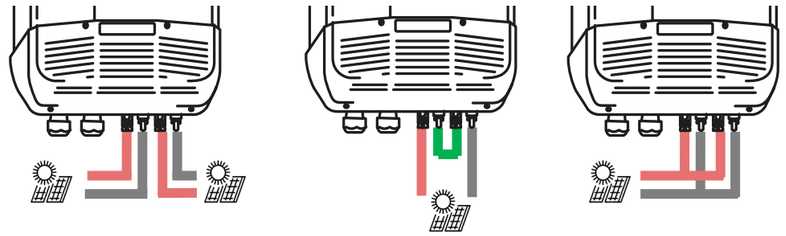
VS-120, 2 inputs in parrallel, Batt 60V

	VS-70	VS-120		
	1 MPPT input	MPPT 1/2	1+2 in parallel	1+2 in series
Solar PV				
Max. solar power recommended (@STC)	4200 W	3500 W	7000 W	7000 W
Maximum current PV	13 A	13 A	26 A	13 A
Max. solar open circuit voltage	600 V	600 V	600 V	900 V
Min. solar functional circuit voltage	100 V	100 V	100 V	200 V
Recommended MPP voltage	250 – 500 V	250 – 500 V	250 – 500 V	500 – 750 V
MPPT tracking efficiency	> 99.8 %			
Max. efficiency	98 %			
PV connectors	supplied Sunclix PV connectors			
Battery charger				
Max. output current	70 A	60 A	120 A	120 A
Nominal battery voltage (Input range)	48 V			
Operating voltage range	38 – 68 V			
Battery grounding possibility	battery + or battery	battery + or battery		
Max. standby consumption	< 20 mA (1 W)	< 25 mA (1.25 W)		
General data				
Weight	5.51 kg	7.5 kg		
Dimensions h/w/l	120 / 220 / 350 mm	133 / 322 / 466 mm		
Ingress Protection according to IEC60529	IP54	IP20		
Conformity	low voltage directive (LVD) 2014/35/EU: EN/IEC 62109-1 electromagnetic compliance (EMC) directive 2014/30/ EU: EN/IEC 61000-6-2, 61000-6-4			

Temperature derating VS120



VS-120: two flexible MPPT inputs



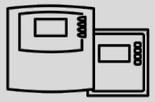
Independant strings 100-600V

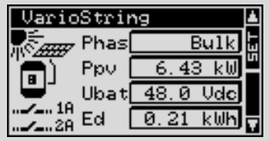
Inputs in series 200-900V

Inputs in parrallel 100-600V

Xtender + Vario accessories

Programming /user interface





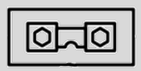
Communication

xcom LAN/GSM

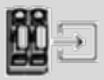
xcom 232i/CAN/485i
Communication bridges (openstuder)

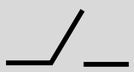
SCADA integration

Measurement

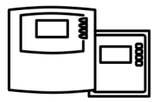


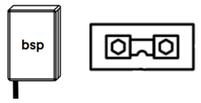
I/O

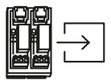




Installation



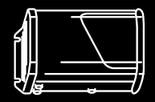


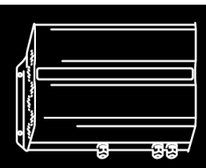


compatibility

			XTS	XTM	XTH	VS	VT
RCC	02/ 03	The remote control module (with 2m cable) enables the setting of the parameters and the display of the values measured. With the SD card it is possible to log the system data and to save and restore the parameters of the system. This module is available either for wall mounting (RCC-02), or for panel mounting (RCC-03).	•	•	•	•	•
XCOM	GSM 4G	Connect your system to the Studer-Portal with 4G with the Xcom-GSM	•	•	•	•	•
	LAN	Connect your system to your local router, internet and the Studer-Portal	•	•	•	•	•
	CAN	CAN communication with Lithium BMS It can be also configured to be a communication bridge in CAN with an open protocole	•	•	•	•	•
	485i	Communication bridge for MODBUS RTU option: 485i-nx preconfigured for communication with next series	•	•	•	•	•
	232i	Communication bridge for RS232	•	•	•	•	•
BSP	500 / 1200	Battery Status Brocessor: shunt measurement to compute the SOC of lead acid batteries, shunts available in 500A or 1200A	•	•	•	•	•
BTS	01	Battery temperature sensor	•	•	•	•	•
ARM	02	Auxiliary remote module	•			•	•
RCM	10	Remote Control Module	•	•			
ECF	01	External Cooling Fan: the use of this accessory will increase the power of the XTS and the current of the VT65 to 80 A.	•				•
X-connect		Mounting frame for multi-XTH system, supplied as a kit. The frame is equipped with DC breakers and fuses, and with rail DIN for the mounting of protection devices upstream			•		
CAB-RJ45-8-xx		Communication cable for the connection between Xtenders and all external accessories. The cables are available in the following lengths: 2, 5, 10, 20 or 50m (xx for the length). For instance: one system with 3 Xtenders requires 2 cables of 2m. One cable is supplied with every accessory. However, a longer cable can be ordered when necessary.	•	•	•	•	•

AJ

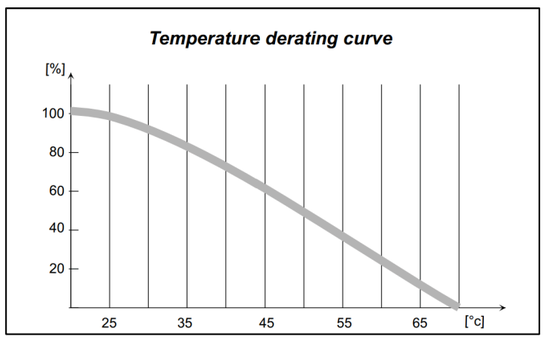



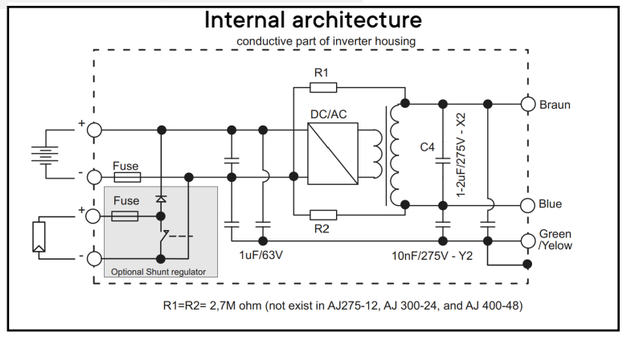


	AJ 275-12	AJ 350-24	AJ 400-48	AJ 500-12	AJ 600-24	AJ 700-48	AJ 1000-12	AJ 1300-24	AJ 2100-12	AJ 2400-24
Inverter Onduleur										
Nominal battery voltage (Input range)	12 Vdc (10.5 - 16 Vdc)	24 Vdc (21 - 32 Vdc)	48 Vdc (42 - 60 Vdc)	12 Vdc (10.5 - 16 Vdc)	24 Vdc (21 - 32 Vdc)	48 Vdc (42 - 60 Vdc)	12 Vdc (10.5 - 16 Vdc)	24 Vdc (21 - 32 Vdc)	12 Vdc (10.5 - 16 Vdc)	24 Vdc (21 - 32 Vdc)
Continuous power @ 25°C	200 VA	300 VA	300 VA	400 VA	500 VA	500 VA	800 VA	1000 VA	2000 VA	2000 VA
Power 30 min. @ 25°C	275 VA	350 VA	400 VA	500 VA	600 VA	700 VA	1000 VA	1300 VA	2100 VA	2400 VA
Power 5 min. @ 25°C	350 VA	500 VA	600 VA	575 VA	675 VA	900 VA	1200 VA	2000 VA	2450 VA	2800 VA
Power 5 sec. @ 25°C	450 VA	650 VA	1000 VA	1000 VA	1200 VA	1400 VA	2200 VA	2800 VA	5000 VA	5200 VA
Asymmetric load	150 VA	150 VA	200 VA	250 VA	300 VA	300 VA	500 VA	600 VA	1000 VA	1200 VA
Max. efficiency (%)	93 %	94 %	94 %	93 %	94 %	94 %	93 %	94 %	92 %	94 %
Cos ϕ max.	0.1–1 to 200 VA	0.1–1 to 300 VA	0.1–1 to 300 VA	0.1–1 to 400 VA	0.1–1 to 500 VA	0.1–1 to 500 VA	0.1–1 to 800 VA	0.1–1 to 1000 VA	0.1 – 1 up to 2000 VA	
Detection of the load	2 W only with the solar option -S			Adjustable: 1 to 20 W			2 W only with the solar option -S		Adjustable: 1 to 20 W	
Short-circuit current AC 2 sec.	2.3 Aac (4.6 Aac*)	3.2 Aac (6.4 Aac*)	4.6 Aac (9.2 Aac*)	5.2 Aac (10.4 Aac*)	5.7 Aac (11.4 Aac*)	7 Aac (14 Aac*)	10 Aac (20 Aac*)	13 Aac (26 Aac)	26 Aac (52 Aac*)	30 Aac (60 Aac*)
Output voltage	Sine wave 230 Vac (120 Vac*) ±5 %									
Distortion THD (resistive load)	< 3 % (@ Pnom & Uin nom.)									
Frequency	50 Hz (60 Hz*) ± 0.05 % (crystal controlled									
Consumption Stand-by / ON no load	0.3 W**/ 2.4 W	0.5 W**/ 3.5 W	1.1 W**/ 5.2 W	0.4 W/ 4.6 W	0.6 W/ 7.2 W	1.5 W/ 12 W	0.7 W/ 10 W	1.2 W/ 13 W	0.7 W/ 16 W	1.2 W/ 16 W
Reverse polarity protection intern fuse	60 A	40 A	25 A	120 A	90 A	60 A	125 A	100 A	Not protected	150 A
General data										
Weight	2.4 kg	2.6 kg	2.6 kg	4.5 kg			8.5 kg		19 kg	18 kg
Dimensions h/w/l	142 / 163 / 84 mm			142 / 240 / 84 mm			142 / 428 / 84 mm		273 / 399 / 117 mm	
Length cables (battery/AC out)	1.2 m / 1 m			1.5 m / 1 m			1.5 m / 1 m		1.7 m / 1 m	
Acoustic level	< 45 dB (with ventilation)									
Conformity	low voltage directive (LVD) 2014/35/EU: EN/IEC 62109-1, 62109-2, 62477-1, electromagnetic compliance (EMC) directive 2014/30/EU: EN/IEC 61000-3-3, 61000-6-2, 61000-6-4, 62040-2									
Ingress protection of enclosures	IP30			IP30			IP30		IP20	
Operating temperature range	-20 to 50°C									
Approximate correction of Pnom	-1.5 % / °C from + 25°C									
Relative humidity	95 % (non-condensing)									
Solar Options										
Voltage max	25 Vdc	45 Vdc	90 Vdc	25 Vdc	45 Vdc	90 Vdc	25 Vdc	45 Vdc	25 Vdc	45 Vdc
Current max	10 Adc			15 Adc			25 Adc		30 Adc	
Principle	Floating 3 stages (I/U/UO)									
Absorption voltage	14.4 Vdc	28.8 Vdc	57.6 Vdc	14.4 Vdc	28.8 Vdc	57.6 Vdc	14.4 Vdc	28.8 Vdc	14.4 Vdc	28.8 Vdc
Floating voltage	13.6 Vdc	27.2 Vdc	54.4 Vdc	13.6 Vdc	27.2 Vdc	54.4 Vdc	13.6 Vdc	27.2 Vdc	13.6 Vdc	27.2 Vdc
Control Options	rcm01/02/03			rcm01/02/03			jt8		jt8	

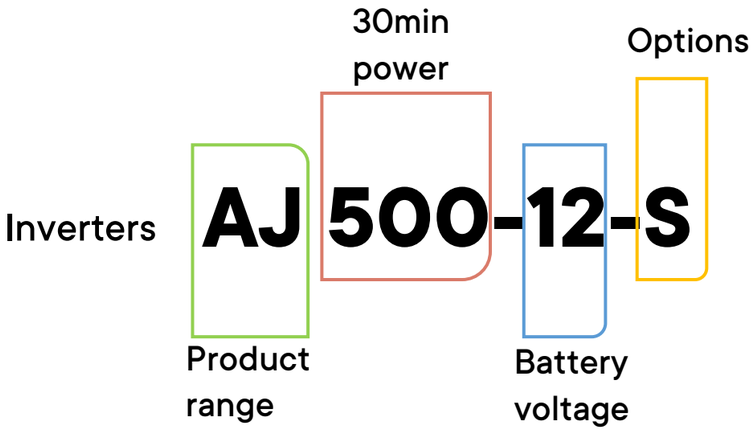
Functionalities

Overheat protection (±5°C) Shut down @ 75°C - Auto-restart @ 70°C
Overload and short circuit protection Automatic disconnection with 2 times restart attempt
Deep discharge battery protection Shut off @ 0.87 x Unom - Automatic restart @ Unom
Max. battery voltage Shut off @ >1.33 x Unom - Automatic restart @ < Umax
Acoustic alarm Before low battery or overheating disconnection
Ventilation forced from 45°C ± 5°C | Length





Products naming



Standard inverters models without –option are always 230Vac and 50Hz output voltage

AJ series - Sine wave inverters

Type	Input Vdc	Power 30' VA	Cont. power VA	Output Vac	Built-in solar Regulator (option -S) A /Vmax	lxwxh mm	Weight kg
AJ 275-12	12	275	200	230	10A / 25V	163x142x84	2.55
AJ 350-24	24	350	300	230	10A / 45V	163x142x84	2.75
AJ 400-48	48	400	300	230	10A / 90V	163x142x84	2.85
AJ 500-12	12	500	400	230	15A / 25V	240x142x84	4.6
AJ 600-24	24	600	500	230	15A / 45V	240x142x84	4.65
AJ 700-48	48	700	500	230	15A / 90V	240x142x84	4.6
AJ 1000-12	12	1000	800	230	25A / 25V	428x142x84	8.6
AJ 1300-24	24	1300	1000	230	25A / 45V	428x142x84	8.65
AJ 2100-12	12	2100	2000	230	30A / 25V	399x273x117	19.5
AJ 2400-24	24	2400	2000	230	30A / 45V	399x273x117	18.15
JT 8	Remote control box from 1000-12 to 2400-24 S, incl. 5 m cable					58x51.5x22	0.3
RCM-01/02/03	Remote control plug from 275-12 to 700-48 S supplied mounted - factory setting as per requirement						

Model options

-S solar regulator included
-01 version 120Vac/60Hz
-02 version 120Vac/50Hz
-03 version 220Vac/60Hz
-rcm01 version with remote command with unit that start when contact closed on rcm input
-rcm02 version with remote command used as a press button
-rcm03 version with remote command with unit that start when contact open on rcm input

Next series - Smart inverter-chargers / transfer system, integrated solar for Next3

Type	Input Vdc	Power 30' VA	Cont. power VA	Output Vac	Charger A	lxwxh mm	Weight kg
nx3-16000-48 sti	48	16000	15000	230	0-300	310x210x110	58
nx1-6500-48	48	6500	4500	230	0-125	420x550x175	36
nx1-4500-48	24	500	3500	230	NYA	420x550x175	33
nxi	nx-interface touchscreen						
nx wifiDongle	compatible usb wifi dongle						
nx tempSensor	temperature sensor for remote sensing of lead acid batteries						
nx bypass box	a threephase automatic transfer switch with or without an emergency stop on it						
nx pm	power meter with Modbus RTU communication for nx3, 60A*						
xcom 485i-nx	communication bridge to communicate with vario solar charge controlers						

Model options

nx3 -sti (default)
-st =without nx-interface for second unit in //
-rack: 19" rack version
Infra: nx3 rack mounted in cabinet with batteries, cabling, protections

nx1 -us: 120V/60Hz option

Xtender series - Sine wave inverter-chargers / transfer system - with Smart-Boost

Type	Input Vdc	Power 30' VA	Cont. power VA	Output Vac	Charger A	lxwxh mm	Weight kg
XTS 900-12	12	900*/700	650*/500	230	0-35	310x210x110	11.1
XTS 1200-24	24	1200*/1000	800*/650	230	0-25	310x210x110	10.85
XTS 1400-48	48	1400*/1200	900*/750	230	0-12	310x210x110	10.75
XTM 1500-12	12	1500	1500	230	0-70	322x466x133	16.4
XTM 2000-12	12	2000	2000	230	0-100	322x466x133	22.45
XTM 2400-24	24	2400	2000	230	0-55	322x466x133	18
XTM 2600-48	48	2600	2000	230	0-30	322x466x133	17.55
XTH 3000-12	12	3000	2500	230	0-160	500x300x230	29.35
XTM 3500-24	24	3500	3000	230	0-90	322x466x133	23.95
XTM 4000-48	48	4000	3500	230	0-50	322x466x133	25.3
XTH 5000-24	24	5000	4500	230	0-140	500x300x230	35.1
XTH 6000-48	48	6000	5000	230	0-100	500x300x230	38.55
XTH 8000-48	48	8000	7000	230	0-120	500x300x230	44.75

Model options

-01 version 120Vac/60Hz except XTH 8000-48

*With ECF-01

VarioTrack/VarioString - MPPT Solar Charge Controllers

Type	Battery voltage Vdc	PV voltage Vdc	Max. current A	Max PV power W	lxwxh mm	Weight kg
VT-40-145	12, 24, 48	up to 145	40	2500	310x220x120	3.8
VT-65-175	12, 24, 48	up to 175	65	4000	310x220x120	6.1
VT-80-175	12, 24, 48	up to 175	80	5000	350x220x120	6.5
VS-70	48	up to 600	70	4200	350x220x120	6
VS-120	48	up to 900	120	7000	466x322x133	9.55

Accessories for Xtenders and VarioTrack/VarioString systems

X-Connect	Mounting system for 3 XTH units	981x917x29	28.5
RCC-02	Remote control and programming centre + 2 m cable for wall mounting	170x168x43.5	
RCC-03	Remote control and programming centre + 2 m cable for panel mounting	130x120x42.2	
Xcom-CAN	CAN to CAN interface with 2x 2 m cable	110.5x75x26	
Xcom-485i	Modbus RTU Gateway with 2x 2 m cabl e	110.5x75x26	
Xcom-232i	Isolated RS232 communication module with 2 m cable	110.5x75x26	
Xcom-LAN	Internet based communication set, with Ethernet bridge and 2 m cable		
Xcom-GSM	Internet based communication set, with GSM modem and 2 m cable		
RCM-10	Remote command module for XTS/XTM with 5 m cable	78x45x37	
ECF-01	IP 54 cooling fan module for XTS	60x210x110	
ARM-02	Auxiliary relay module for XTS & VT (2 programmable relays) with 5 m cable	45x73x45	
BTS-01	Battery temperature sensor with 5 m cable	58x51.5x22	
BSP 500	Battery status processor with 500A shunt & 5 m cable	110.5x75x26	
BSP 1200	Battery status processor with 1200A shunt & 5 m cable	110.5x75x26	

Cables

CAB-RJ45-8-2	Cable type RJ45 8 pins - 2 m - for parallelization and 3-phase implementation
CAB-RJ45-8-5	Cable type RJ45 8 pins - 5 m - for RCC-01 / RCC-02 / RCC-03 …etc
CAB-RJ45-8-20	Cable type RJ45 8 pins - 20 m - for RCC-01 / RCC-02 / RCC-03 …etc
CAB-RJ45-8-50	Cable type RJ45 8 pins - 50 m - for RCC-01 / RCC-02 / RCC-03 …etc
CAB-RJ45-8-…	Cable type RJ45 8 pins - per m - for RCC-01 / RCC-02 / RCC-03 …etc
RACC-RJ45-8-F/F	Connector Female/Female for 8 pins RJ45 cable (for RCC-01 / RCC-02 / RCC-03)
Y-RJ45-8	Y connector for 8 pins cable
CAB-RJ11-6-5	Cable type RJ11 6 pins - 5 m (for CT-35 / RPS-01 / BTS-01)
CAB-RJ11-6-…	Cable type RJ11 6 pins - per m (for CT-35 / RPS-01 / BTS-01)
RACC-RJ11-6-F/F	Connector Female/Female for 6 pins RJ11 cable (for CT-35 / RPS-01 / BTS-01)
Y-RJ11-6	Y connector for 6 pins cable (for CT-35 / RPS-01 / BTS-01)

Project references

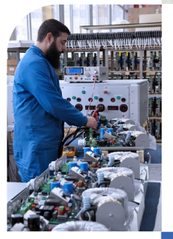
Selection of international projects with Studer components

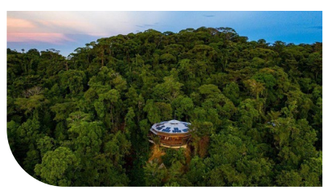
Check our case studies

studer-innotec.com/case-studies/

Contact us to share yours

Year	Project type	Rural electrification, solar home systems	Country
2007	Rural electrification	1000 systems for rural schools and health dispensers	Sri Lanka
2013	Rural electrification	1500 solar individual systems for rural electrification	Ecuador
2016	Rural electrification	90 individual solar off-grid systems in the Toconce region	Chile
2018	Rural electrification	Smart rural community Mistruck	Honduras
2017	Rural electrification	Euro-solar offgrid 600 kits project	Latam
2019	Rural electrification	Empowering Mushuk Lamas	Peru
2023	Rural electrification	Health clinics	India
2016	Minigrid	5 Solar minigrids for remote island communities	Ghana
2017	Minigrid	Mpale Solar minigrid for village electrifcation, Best offgrid project 2017 ARE	Tanzania
2019	Minigrid	Hybrid micro-grid at 4100m above sea level	Chile
2019	Minigrid	Hurri Hills solar minigrid for productive uses	Kenya
2017	Minigrid	Hydroelectric rural minigrid in Mohari village	Nepal
2022	Minigrid	Minigrid for agriculture activities	Myanmar
2024	Minigrid	Distributed minigrid	Colombia
2016	Offgrid	Offgrid centralized systems for street-lighting	Egypt
2018	Offgrid	Offgrid water pumping station	Colombia
2016	Offgrid	Off-grid lodge in a National Park	South Africa
2021	Offgrid	Ecofriendly and autonomous atmospheric water plant	Barbados
2015	Offgrid	Offgrid watewater treatment system	Australia
2021	Offgrid	Sustainable offgrid resort in a Caribbean rainforest	Panama
2020	Offgrid	Offgrid system in a luxury apartment complex in Bangalore	India
2016	Offgrid	Wind and solar offgrid system to power 2 large chicken sheds	Ireland
2019	Offgrid	Capana Gnifetti, hybrid system at 3647m	Italy
2023	Offgrid	+150 microgrids rural communities with genset sync	India
2018	Telecom	Italezpi offgrid telecommunication system	Spain
2019	Telecom	Repowering telecom remote stations Viva with DC solar fuel saving	Bolivia
2020	Telecom	Telefonica hybrid systems to reduce diesel consumption	Peru
2018	Backup	UPS backup system at Kenya's first green certified building Dunhill Towers	Kenia
2021	Backup	Nammane Industries grid backup and self-consumption system	India
2006	Mobile	Pepamobil, truck tour of America	Paraguay
2019	Mobile	Solar butterfly world tour	Switzerland
2023	Mobile	Peak Evolution, World high-altitude record with EV	Chile
2022	Ongrid	Self-sufficient home with EV	Switzerland
2023	Ongrid	Solar+wind self-sufficient country residence	Sweden
2024	Ongrid	Autonomous residence with EV	Slovakia





Reliable power and energy for everyone, everywhere

Built to last

All our products are designed and manufactured in our factory in Sion in Switzerland and come with an exceptional warranty of 10 years.

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ISO certified factory
9001:2020/14001:2020.

March 2025 – v1.6

Cover: offgrid site powered by next3s: Tortin hut, captured by Albrecht Voss with an exceptional boreal aurora for the latitude of the Alps during May 2024
Here: Zermatt village at the foot of the Matterhorn mountain, close to Studer factory