

Off-Grid solutions

Studer reaches beyond the grid



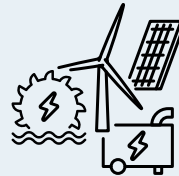
Studer reaches beyond the grid

Security and comfort (lighting, heating, household appliances, leisure electronics, telecom...) can now be provided by stand-alone energy systems; when being far away from any electrical grid, either by choice or by necessity.

Electrification of Tikal National Park in Guatemala



Stand-alone systems consist of three main components:

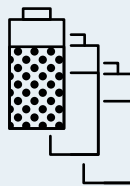


An energy source

Renewable energy in form of a solar generator, a wind/hydro turbine; or a diesel generator; or a combination of energy sources

Battery storage

In order to store energy during the production periods for a later use when there is no further production



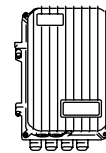
Power electronics

Devices able to charge the battery from the energy source(s) and to supply users with AC voltage (inverter, inverter/charger, charge controller).





Off-grid installation at Bora Bora island in Nicaragua

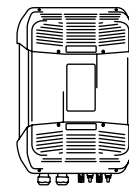


VarioTrack Series

- VT-65
- VT-80



High-altitude installation at the Capanna Gnifetti mountain hut in the Italian alps

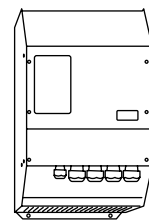


VarioString Series

- VS-70
- VS-120

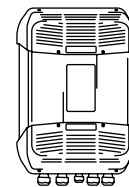


Stand-alone energy systems at lodges in Kruger National Park, South Africa

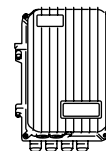


Xtender Series

- XTH 3000-12
- XTH 5000-24
- XTH 6000-48
- XTH 8000-48



- XTM 1500-12
- XTM 2000-12
- XTM 2400-24
- XTM 2600-48
- XTM 3500-24
- XTM 4000-48



- XTS 900-12
- XTS 1200-24
- XTS 1400-48

Hybrid systems

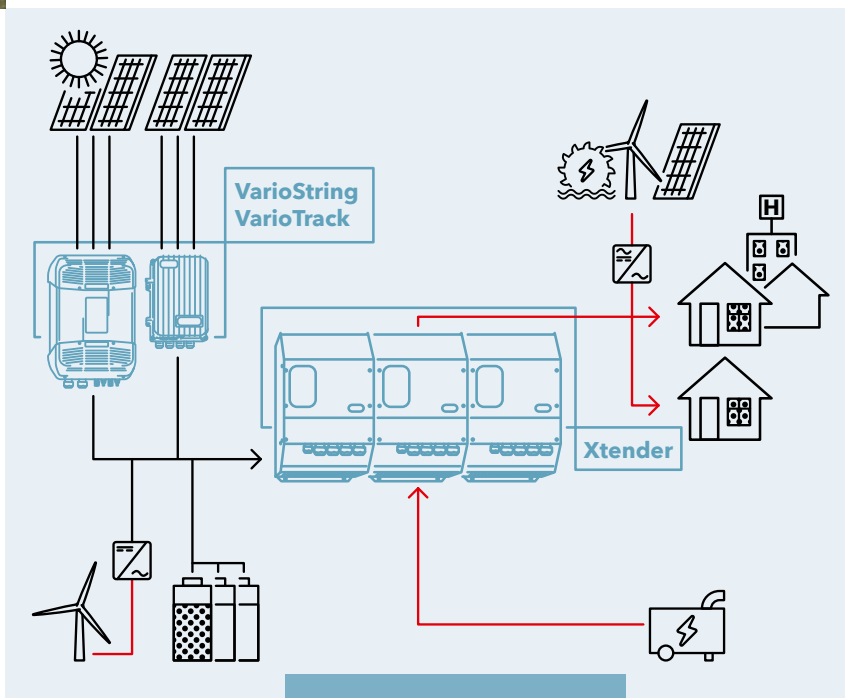


At the heart of a hybrid system

A “hybrid system” is a combination of different energy sources: one or more renewable energy sources RES (solar, wind, hydro), a diesel/gas generator and a battery bank. By combining several renewable energy sources the system provides a stable electricity supply throughout the year and the seasons. During summer the solar modules produce more energy and in winter the wind energy is more productive. Using micro hydro power allows to have a constant base power source using a constant water flow for compensating the lack of solar production during the night.

The generator is used to fill the energy deficits of other RES producers that depend on environmental conditions.

Including a generator allows to dimension the RES and the battery components more accurately, increasing the system’s reliability and efficiency.



Hybrid systems; single phase from 0.5 to 24kVA or three-phase from 1.5 to 72 kVA



Xtender & Vario series

Products from the **Xtender** and **VarioTrack/VarioString** series constitute the perfect base to build a hybrid system for off-grid electrification or solar backup in an unreliable grid environment.

Xtender series

Hybrid/bidirectional inverter

Create flexible hybrid energy systems with **XTS, XTM** or **XTH**, from small 1kW up to 24kW single phase or in three-phase from 3 to 72kW with a powerful transfer switch. It automatically manages the energy from generator or grid and local renewable energy from solar or other source, with the following outstanding features and benefits:

- Wide design flexibility to cover the very variable size and topology of hybrid systems
- A large range of power matching various demands of rural electrification market
- Matches all kind of loads; asymmetrical, inductive and reactive
- Compatible with grid inverters for AC coupling with programmable frequency shift management
- An extensive set of parameters to fulfil the specific requirements of tailored hybrid systems
- Two independent programmable auxiliary relays and one programmable remote entry
- Scalable topology form one single phase unit up to 9 units in three-phase configuration

Vario series

MPPT solar charge controller

Maximize the energy generated from solar generator by using **VarioTrack** or **VarioString** MPPT solar charge controller. Both models are the right choice for a coherent solar hybrid system with up to 15 units in parallel, perfectly synchronized with the **Xtender**.

VarioTrack 65 or 80A /12-24-48V

- Up to 150V PV Voc
- Full protection against incorrect wiring
- Designed for use in harsh environment (IP54)
- MPPT /conversion efficiency > 99.5 / 99%

VarioString 70A or 120A /48V

- Up to 1 x 600V or 2 x 600V / 1 x 900V PV Voc
- Reinforced isolation between PV and Battery
- Higher voltage string reduces BOS costs
- Safe, simple PV connection with Sunclix™
- MPPT /conversion efficiency > 99.5 / 98%



Each battery type has design and performance features suited for particular applications. The designer must consider the advantages and disadvantages of different batteries with respect to the requirements of a particular application. Some of the considerations include lifetime, deep cycle performance, tolerance to high temperatures and overcharge, maintenance.

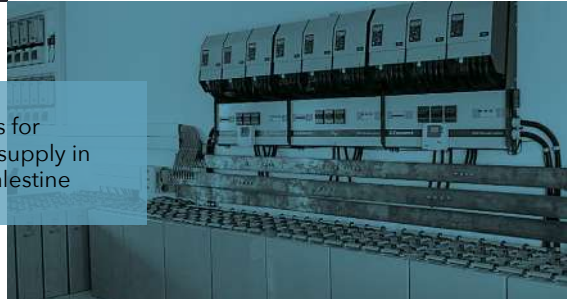
Xtender & Vario series work with any type of battery

Installation with nickel-iron batteries for self-consumption in an off-grid family house in Austria



The **Xtender** family smart battery management allows to configure the battery management cycle according to the specific needs of your battery. More than 70 parameters will allow to configure the battery cycle according to battery manufacturer specific requirements. Studer is compatible with all battery technologies. Battery manufacturers advise to work with Studer products.

Installation with lead-acid batteries for backup and uninterrupted power supply in the Islamic University of Gaza in Palestine



Installation with lithium batteries for an electric vehicle charging station in Spain

Lithium batteries

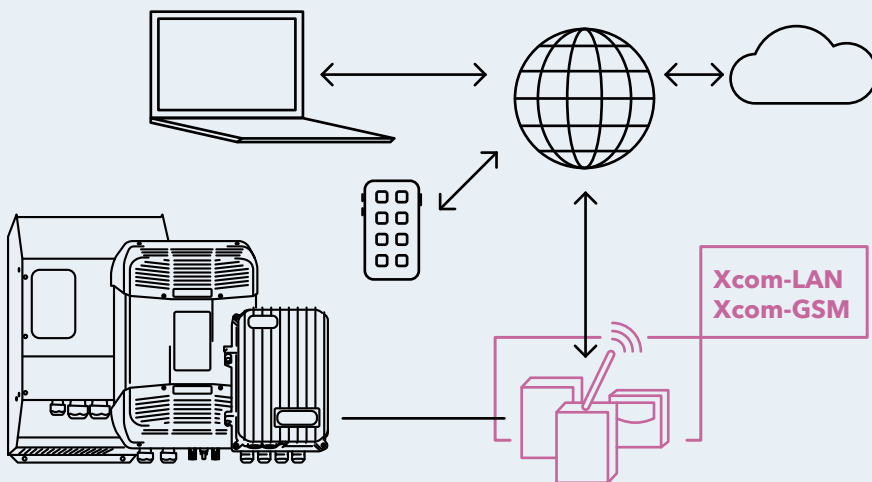
Lithium batteries are being used more and more in off-grid, self-consumption, mobile and energy storage applications. There are two main types of lithium batteries: with and without communication. Most lithium batteries require communication between their Battery Management System (BMS) and the rest of the system for an optimal management of the battery (safety and lifetime). Every battery uses its own specific protocol for communication.

For an effective communication with lithium batteries Studer has conceived the **Xcom-CAN**, which creates a bridge between the BMS and the Studer bus. The **Xcom-CAN** has several protocols implemented for lithium battery management, making Studer products compatible and highly effective with many lithium batteries.

Communication & control



Harmonized components ease control and system design



Internet control and communication

Always in control of the system

Total control of the system is possible via internet on our secured server. The connection with the internet is carried out either by the **Xcom-LAN**, provided the site has internet access via a local network; or by **Xcom-GSM**, if there the site has access to the mobile phone network.

Our server will provide secure and full access - parameters, real time data, data log, configuration of alarms by SMS or E-Mail, etc. - to all sites with an **Xcom-LAN** or **Xcom-GSM** installed, and by means of any device with an internet browser: smartphone, PC or tablet.

Local monitoring and control with the **RCC-02/-03** and remote monitoring and control with the **Xcom-LAN** or **Xcom-GSM**.



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