The TESVOLT energy management system

Fully integrated and digital

TESVOLT

Free to go green.

Control and monitoring made easy

All generators and consumers locally networked in one system

The TESVOLT energy management system is unique: all generators and consumers are networked in one system. All energy flows are recorded, visualised, monitored and controllable. Your four cornerstones for success:

1. Fully digital

All generators and consumers on the TESVOLT compatibility list can be visualised in the myTESWORLD portal via Modbus.

2. Maximum economic efficiency

Numerous energy services ensure the optimisation of local energy consumption and load control (e.g. charging stations).

3. Absolute transparency

All generators and consumers are visualised in the myTESWORLD portal/app and energy data can be stored and evaluated.

4. Local networking, global thinking

Our vision: all storage systems and generator systems are networked irrespective of location, while excess electricity is jointly marketed on the electricity exchange.

The three components of the TESVOLT energy management system

Hardware, online portal/app and energy services

The hardware: TESVOLT Energy Manager

The KC4S is the heart of our energy management system. It can be integrated locally in the meter cabinet via the **TESVOLT Backup Control Box**.

- Autonomous energy management
- Data acquisition and optimised energy flows
- Generation, load and storage system control
- Configuration through a user interface with different views for different user groups

Online portal & app

The **myTESWORLD portal** is simple to access using a web browser or app. It offers a wide range of functions for monitoring and controlling energy flows. Standard functions are already integrated in the free Basic version, while additional functions are available in the fee-based Pro version.

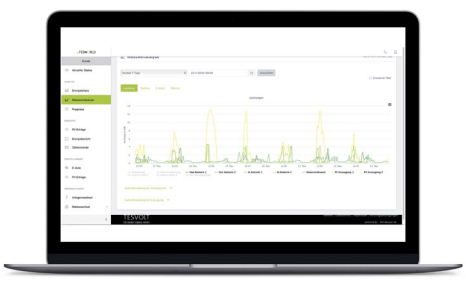
- Real-time dashboard
- Overview of power consumption and generation
- Detailed breakdown of consumption and generation
- Energy balance
- Metering data history
- Energy reports and detailed meter readings (may not be used for billing purposes)

GET IT ON Google Play

Download on the App Store

Test the myTESWORLD demo version now!

Would you like to get to know myTESWORLD better? Then simply sign up for test access via our **EMS portal at https://mytesworld.tesvolt.com** and get an overview of all the functions of our energy management solution at your leisure. We'd naturally be delighted to help you if you have any questions.



The energy services

Comprehensive, powerful & economically efficient

The free Basic version of the TESVOLT energy management system already covers traditional requirements such as self-consumption optimisation and straightforward charging station control. However, it is in the Pro version that the EMS really comes into its own, with features tailored to individual needs. Enter a world of transparency and control.

Basic version functions

The Basic version is included in the battery storage system at no additional cost. It includes all the energy service functions listed below. These can be combined under restrictions (1st restriction: only if PV and battery inverter each fulfill an energy service function. 2nd restriction: the customer can combine a maximum of two energy services).

Self-consumption optimisation	The goal for this application is an output of zero watts at the grid connection point. The battery is completely discharged when power is being drawn from the grid and is charged until full when power is being fed into the grid. As a result, this enables various control options for consumers and generators. These options can be switched on and off depending on the available energy supply.
Physical peak shaving	If a peak load exceeds a defined limit, it is restricted by the storage system. The storage system supplies the necessary electricity, thus keeping the grid load within the defined value.
Zero feed-in	The battery ensures that no electricity is fed into the grid. For example, the PV installations are curtailed when the state of charge increases such that the battery remains capable of responding and absorbing excess energy.
Charging station control	In the Basic version, exactly one charge set point can be integrated and controlled. The charge point can be controlled together with other generators and consumers in order to reduce peak loads, set the grid consumption for charging an electric vehicle or define the maximum drawing capacity of the charge set point, for example.
Generation control	Generators are controlled by digital switching contacts. A tolerance time can also be set. Exceeding or falling short of this time triggers the circuit.
Load control	Consumers are controlled by digital switching contacts. A tolerance time can also be set. Exceeding or falling short of this time triggers the circuit.

Functions of the Pro version

The Pro version can be added to the battery storage system at an additional annual cost of EUR 3/kW (battery inverter output).
It includes all of the energy service features listed below as well as the Basic version. Considering project-specific dependencies, these features can be combined and allow the simultaneous use of different energy service strategies.

Peak shaving RLPM	Peak shaving RLPM only kicks in when the average consumption threatens to exceed the maximum tolerated peak value within a 15-minute interval. Individual peak loads above the configured peak value are permissible. The 15-minute interval can be adapted to country-specific requirements. The battery is recharged when the target output is insufficient. After the set peak load has been exceeded, the target output is automatically set higher. The desired peak load can be entered manually. The desired changes to the target output can also be entered as a time series so that the new target value is used at the beginning of the next billing period.
Power quality	Harmonics are counterbalanced dynamically, improving the power quality in the system. If these mains harmonics are too strong, all connected devices will be negatively affected. If the mains is outside the standards, there is a risk of loss of warranty and insurance cover no longer being available. The active filter function can prevent these effects.
Multi-use (SCO & PS)	A decision tree can be used to combine multiple energy management strategies. An adjustable SoC threshold in the decision tree node can be used to determine when EVO or LSK is executed as the strategy. This allows multiple energy services to be linked to a single battery. The decision tree can be structured as desired and can contain more than one note.
Multi-use (PS & TOU)	A decision tree can be used to combine multiple energy management strategies. A time series can be stored in a node of the decision tree. Time series are used to define the times at which something is switched on or off. If the time series is on, an energy management strategy, for example LSK, can be executed. If the time series is off, a different strategy is executed. The decision tree can be structured as desired and can contain more than one note.
Multi-use (SCO & TOU)	A decision tree can be used to combine multiple energy management strategies. A time series can be stored in a node of the decision tree. Time series are used to define the times at which something is switched on or off. If the time series is on, an energy management strategy, for example EVO, can be executed. If the time series is off, a different strategy is executed. The decision tree can be structured as desired and can contain more than one note.
Forecast-based charging	The battery charging is controlled based on an AI-based PV generation and consumption forecast. The goal is to keep the maximum feed-in power as constant as possible. If the forecast predicts less of a surplus than required, the batteries are charged with the first surplus. For example, battery charging is shifted to the midday break in order to minimize PV regulation losses.

** Project-based.*

Semi-off-grid operation*	During off-grid operation, the operator's own current generators are disconnected from the public utility grid. Battery storage systems with PV installations always operate in voltage -controlled off-grid operation. If necessary, consumers are synchronized with the off-grid network or the utility grid. The conditions for off-grid switching can be configured in the decision tree.
Charging station control (Pro)	In this application, the maximum possible grid load at the grid connection point or for the entire charging infrastructure can be globally configured. Furthermore, the settings for the minimum and maximum output, the maximum usable electricity drawn from the grid and a priority can be stored for each charge set point. Moreover, additional annual costs of EUR 21 per charge (set) point are incurred for the use of more than six charge (set) points.
Off-grid	The battery inverter is configured to run in grid-forming – i.e. voltage-controlled – operation at all times. Consumers and generators are controlled as a function of the battery's state of charge and the available generation capacity.
Micro-grid*	An individual EMS connects and controls a large number of generators and consumers to enable the stable operation of a small distribution grid. In terms of technical configuration, a micro-grid is equivalent to a more extensive off-grid installation or a more extensive back-up power installation.
Time of use	Time series can be defined which can then be evaluated in the decision tree. A variety of energy management strategies can thus be used as a function of the time. Time series can contain individual times, but can also be created with periods. Switching points with varying periodicity can be stored in a time series.
Back-up power	In the event of a blackout, the grid connection protection detects the disturbance and activates one or more isolating contactors. In addition, the battery inverter detects the disturbance and switches from current-controlled operation to voltage-controlled operation. The installation then runs as an off-grid installation. As soon as the grid is available again, the battery inverter runs in current-controlled operation again.
Direct marketer interface*	Communication between the direct marketer and the PV installation takes place via the direct marketer interface in order to meet the requirement for selling solar power on the electricity exchange according to the market bonus scheme and to guarantee controllability via the EMS.

** Project-based.*


288.02
688.70
600.88
720.19
375.89
202.20
809.94
720.19

Multi-functional multi-use

Unique operational management strategy combination possibilities.

Traditional multi-use applications typically allow two functions to be combined via a storage system, such as self-consumption optimisation and peak shaving. The TESVOLT EMS allows the user to combine numerous applications, including in a time-dependent manner. This opens up completely new possibilities for optimising the use of the storage system. It also makes it possible to respond to regulatory and economic changes in the market and to implement the business models of the future.

	Self-consumption optimisation	Physical peak shaving	Zero feed-in	Charging station control	Generation control	Load control
Self-consumption optimisation		1	1	1	1	1
Physical peak shaving	1		1	1	1	1
Zero feed-in	1	1		1	1	1
Charging station control	1	1	1		1	1
Generation control	1	1	1	1		1
Load control	1	1	1	1	1	

BASIC

	Self-consumption optimisation	Off-grid	Physical peak shaving	Back-up power	Zero feed-in	Charging station control (Pro)	Generation control	Load control	Peak shaving RLPM	Power quality	Forecast-based charging	Semi-off-grid operation*	Micro-grid*	Time of use	Direct marketer interface*
Self-consumption optimisation		0	1	1	1	1	1	1	1	1	1	1*	0	1	1*
Off-grid	0		0	0	0	1	0	1	0	1	1	na	na	1	na
Physical peak shaving	1	0		1	1	1	1	1	na	1	1	1*	na	1	1*
Back-up power	1	0	1		1	1	1	1	1	1	1	na	na	1	1*
Zero feed-in	1	0	1	1		1	1	1	1	1	1	1*	na	1	-
Charging station control (Pro)	1	1	1	1	1		1	1	1	1	0	1*	1*	0	1*
Generation control	1	0	1	1	1	1		1	1	1	1	1*	0	1	1*
Load control	1	1	1	1	1	1	1		1	1	1	1*	1*	1	1*
Peak shaving RLPM	1	0	na	1	1	1	1	1		1	1	0	1*	1	-
Power quality	1	1	1	1	1	1	1	1	1		1	1*	1*	1	1*
Forecast-based charging	1	1	1	1	1	0	1	1	1	1		1*	1*	1	1*
Semi-off-grid operation*	1*	na	1*	na	1*	1*	1*	1*	0	1*	1*		1*	1*	-
Micro-grid*	0	na	na	na	na	1*	0	1*	1*	1*	1*	1*		1*	-
Time of use	1	1	1	1	1	0	1	1	1	1	1	1*	1*		1*
Direct marketer interface*	1*	na	1*	1*	-	1*	1*	1*	-	1*	1*	-	-	1*	

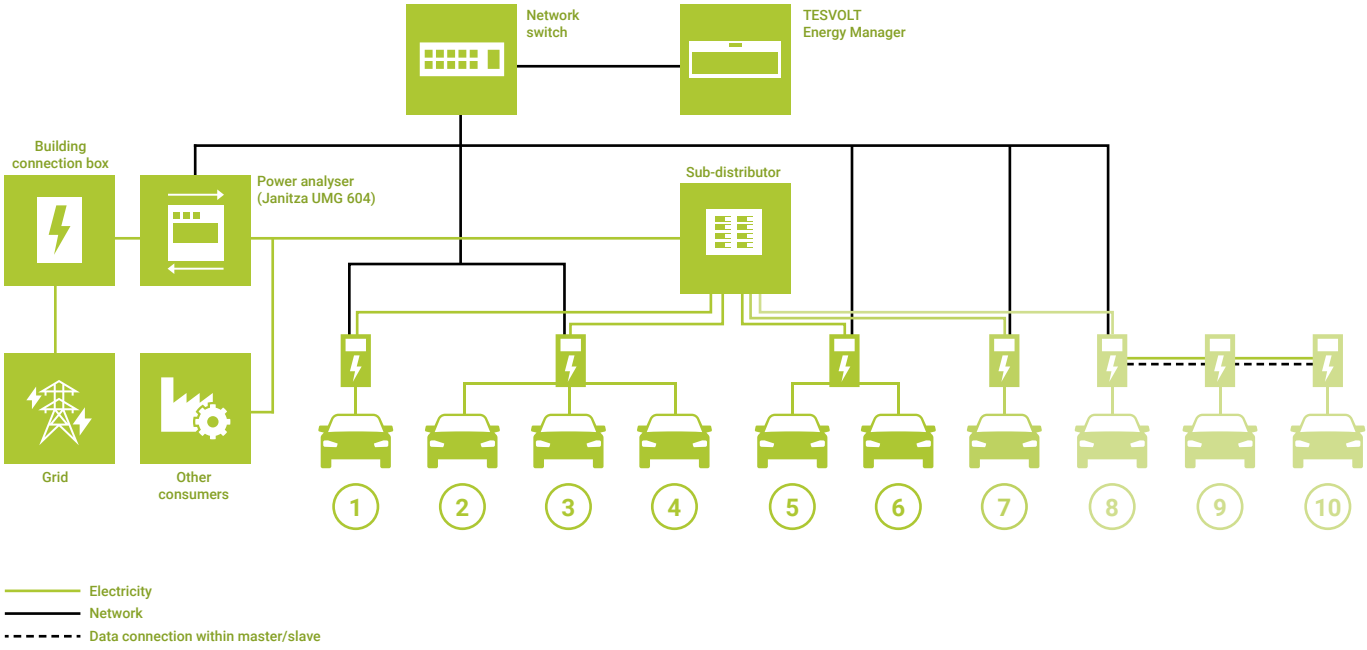
BASIC + PRO

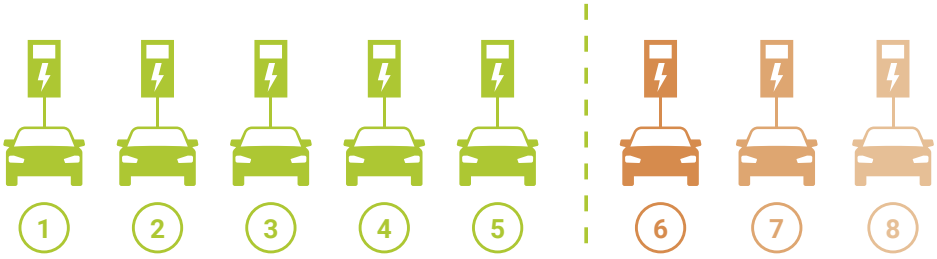
1 Combination is possible
0 Combination is not possible
* Combinations are possible on a project-by-project basis
na Not applicable
- Not yet possible to say

Charging station control

Limited grid connection? No problem with the TESVOLT EMS

Where a user has only a limited grid connection, they can dynamically control the output of the charging infrastructure. The only requirement for this is a TESVOLT Energy Manager and a power analyser. The power analyser gauges the power at the limited grid connection. The TESVOLT Energy Manager determines the power available for the charging infrastructure, taking into account other consumers and generators (e.g. whether a CHP can still be switched on if the power is not sufficient). It conveys the available power to individual charging points in the form of set points. This means up to 25 charge set points can be controlled easily using a mobile phone app or via the myTESWORLD online portal. TESVOLT facilitates compatibility with most charging stations and, combined with a TESVOLT battery storage system, offers an elegant solution for cushioning peak loads.





What is the difference between the Basic and Pro versions?

The **Basic version** of the TESVOLT Energy Manager includes charge controls for a charging point. You can control multiple charging points via one charge set point, but only with general power controls and not separately from one another.

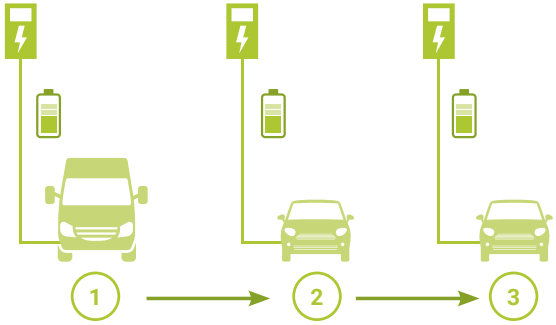
The **Pro version** has all the features of the Pro package, while also permitting dynamic load management of up to 25 charging points with one Energy Manager. It also offers the option of prioritising different members of the charging system, for example hard or soft prioritisation according to charging point number. Each charge set point can also be configured so that it is charged exclusively from a PV installation, meaning only "green electricity" is used.

Prioritisation

Fair distribution

With "fair" distribution, all charging points receive power in amounts that are as equal as possible. The top-priority charging point starts charging first and only receives the minimum charging power (6 A). Then the charging point with the next highest priority starts (minimum) charging. Any remaining surplus is redistributed in the order of prioritisation, with the next charging point down initially getting only the minimum charging power. When all charging points are charging, any further surplus is distributed evenly across all other charging points.

Application example: shopping centres or multi-storey car parks

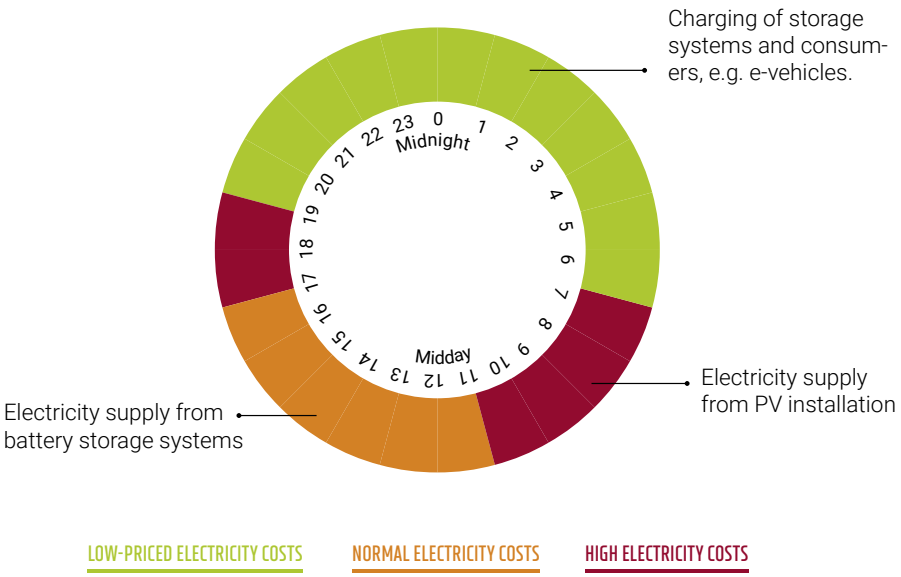


Multi-use and time of use

Benefit from multiple applications in parallel

Multi-use describes the **use of the battery storage system in multiple ways**. This means you can use operational management strategies in a variety of combinations: e.g. self-consumption optimisation (SCO) with time of use (TOU).

One of the key benefits of the TESVOLT Energy Management System is the **multiple options** for **combining applications**. You can combine virtually any applications with each other according to their requirements. This can include making various energy management strategies time-dependent (TOU), with the option of concurrent improved power quality. It is also flexible enough that it can give rise to business models that may not even exist yet.



Multi-use with the example of SCO and TOU

The **TESVOLT Energy Manager** is configured so the amount of electricity that you purchase from the supplier in addition to the electricity you've produced in-house is charged at a particularly affordable price, e.g. at the night tariff. The battery storage system delivers its power from the point at which the company's own electricity production is insufficient to **cover demand**, or at certain times when the supplier's electricity price is particularly high.

Benefits

Maximum flexibility when choosing operational management strategies

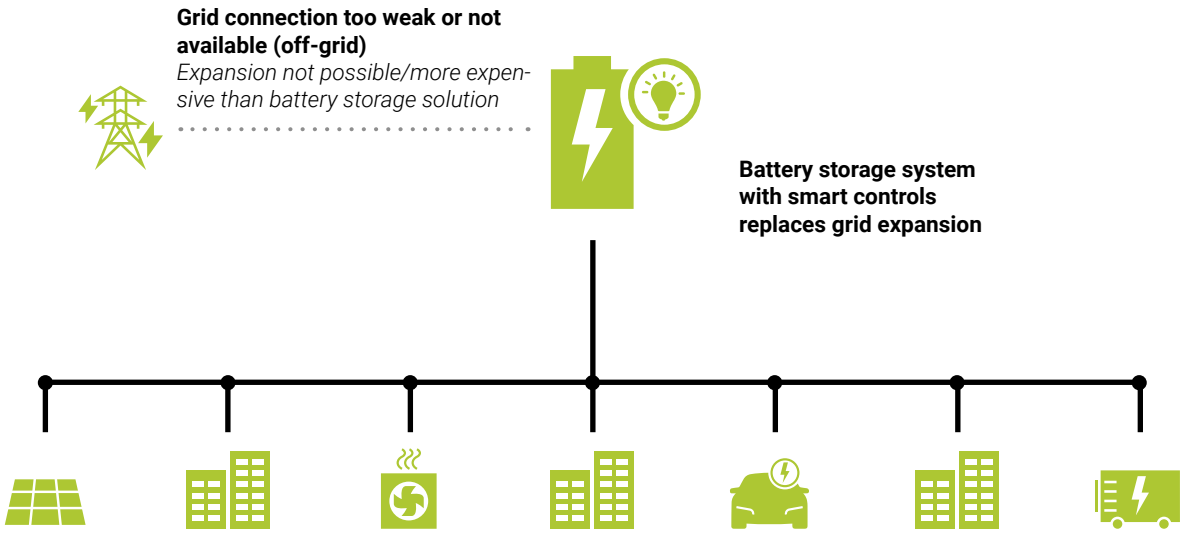
Higher cost savings for electricity

Investment written off sooner

Micro-grid

Utility grid not powerful enough? Try a storage solution rather than grid expansion

Every day, the TESVOLT Energy Manager ensures an optimal charging and consumption strategy. This is based on weather forecast data, and the battery capacity or charging level. In many cases, a maximum load reduction is specified by the grid connection. The TESVOLT system complies with this exactly. The difference between this and the maximum storage capacity can then, for example, be used in combination with a PV installation to optimise self-consumption.



Benefits

Avoid expensive grid connection expansion

Ensures the feasibility of construction projects

Higher cost savings for electricity

Investment written off sooner

Free to go green

Tesvolt AG is an innovation and market leader for commercial and industrial energy storage system solutions in Germany and Europe. TESVOLT products enable companies to end their energy dependency and play a part in the energy transition. The agile company produces intelligent lithium storage systems with power ratings from 30 kilowatt hours through to multiple megawatt hours – with top quality and TÜV-certified safety. Tesvolt manufactures its commercial storage system solutions in series production at its own carbon-neutral gigafactory in Lutherstadt Wittenberg and delivers them worldwide.

This project has received funding from the European Union´s Horizon 2020 research and innovation programme under grant agreement No 829877

MADE IN GERMANY

SAMSUNG SDI PARTNER

TÜVRheinland ZERTIFIZIERT Management System ISO 9001:2015

TESVOLT AG
Am Heideberg 31 | 06886 Lutherstadt Wittenberg
Germany
Phone +49 (0) 3491 8797-100
info@tesvolt.com | **www.tesvolt.com**