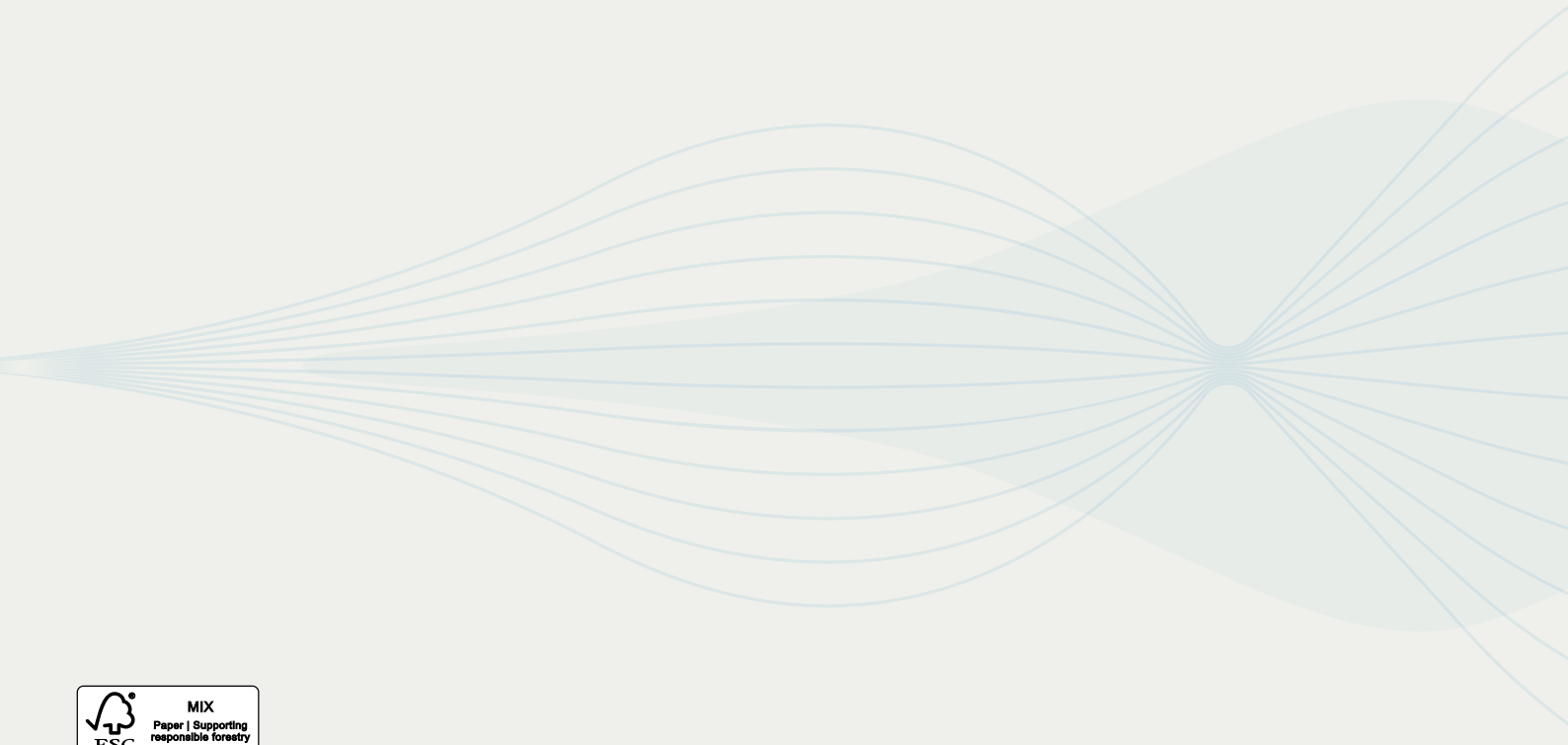


# Off-Grid, Backup & Storage Systems

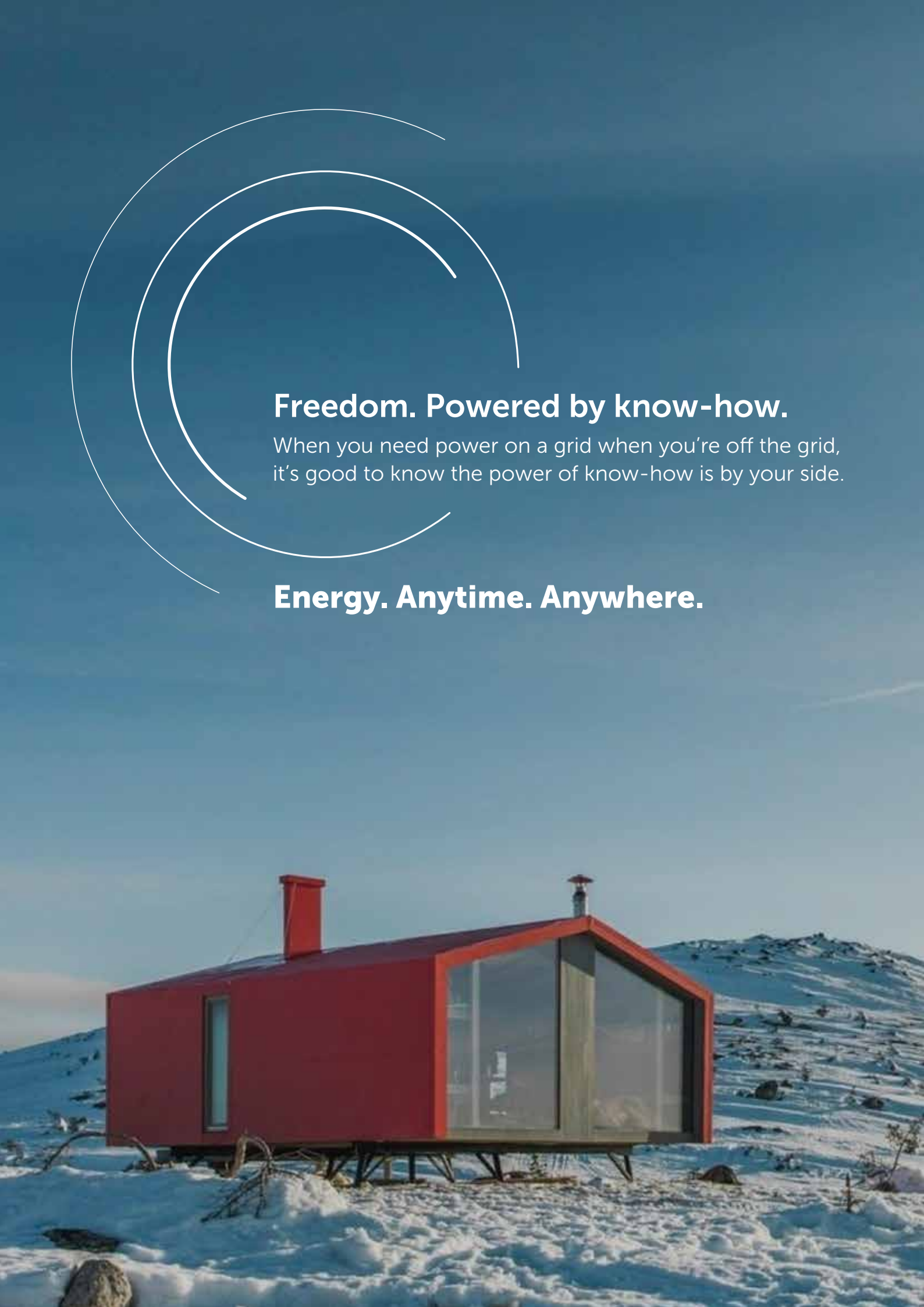
*Technical system examples*

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Freedom. Powered by know-how.
When you need power on a grid when you're off the grid, it's good to know the power of know-how is by your side.
Energy. Anytime. Anywhere.

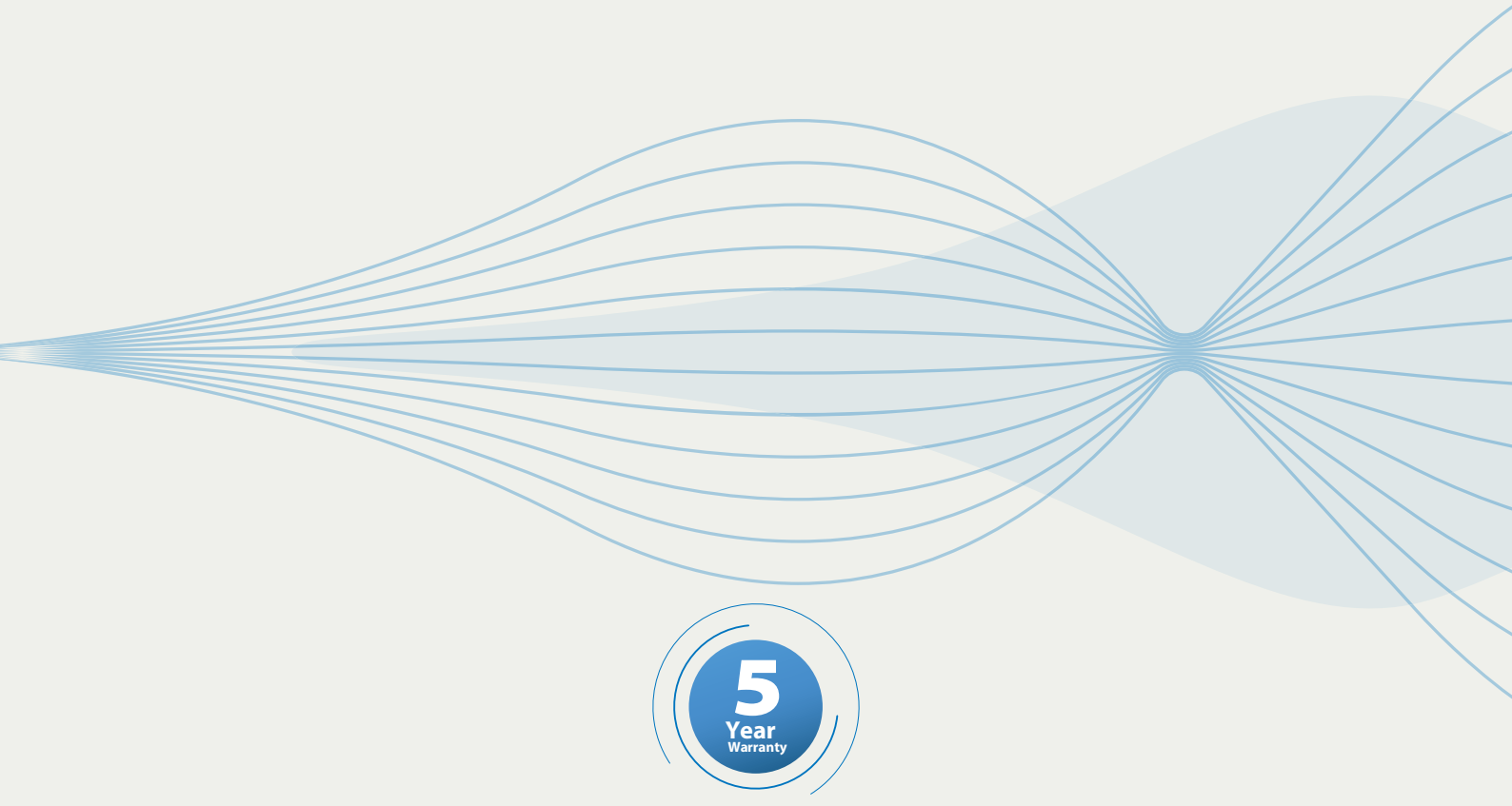

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OFF-GRID, BACKUP & STORAGE SYSTEMS

# How do you build scalable, cost-effective and robust off-grid systems that provide peace of mind?

The solution is powered by know-how. With over 50 years of experience, we've learnt what it takes to build backup and off-grid systems that stand the test of time and the environment. Our customers value the reassurance that our power solutions deliver knowing they have our worldwide network of authorized dealers by their side. They know we don't cut corners, they know our family run business is built on a foundation of trust they can always depend on.

**Energy. Anytime. Anywhere.**







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OFF-GRID, BACKUP & STORAGE SYSTEMS

# Helpful system design resources

Victron Energy offers one of the largest product ranges in the market to cover almost every power challenge.
Admittedly, choosing the right system concept and products can be overwhelming. This brochure intends to assist with basics in systems design, covering a number of different system concepts and solutions for backup and off-grid.
Alternatively, check our helpful resources or feel free to discuss your ideas with a local Victron specialist.

Check our **Off-grid, Backup and Storage** market web-page to explore our deepdive with example calculations.



## Product & design information

Our product pages on the website provide all necessary product information, such as product data sheets, product manuals, more system examples, enclosure drawings and certificates.

## MPPT Calculator Excel sheet

With the MPPT Calculator Excel sheet you can match solar modules to MPPT charge controllers. Download the Excel sheet from our software page:

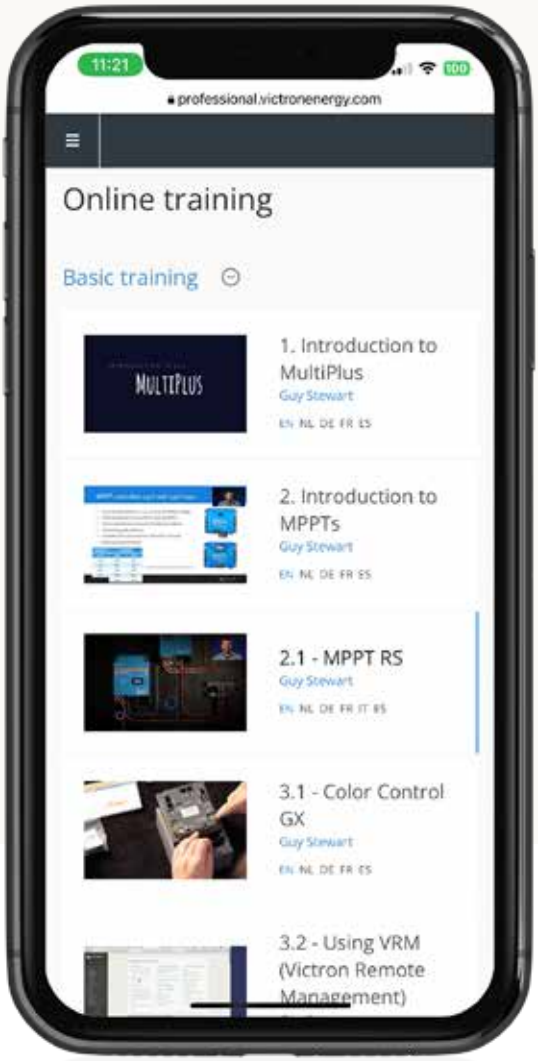
## System examples booklet

Download our systems examples booklet for Off-grid, backup and storage applications with many different system design examples.



## Energy Unlimited & Wiring Unlimited white papers

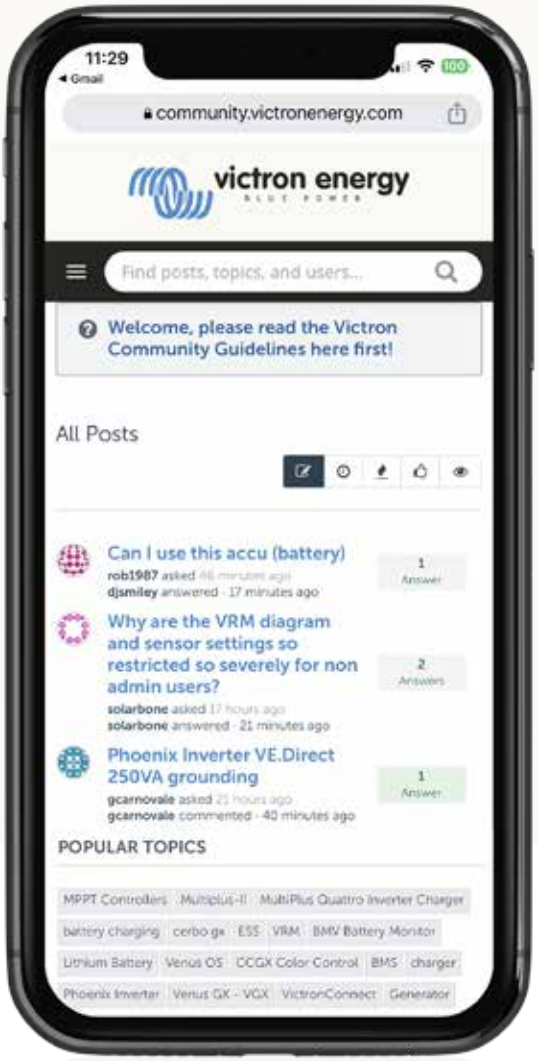
Understand the principles behind off-grid power systems and get your wiring right with Wiring Unlimited. Find these white papers and a large variety of technical papers and example system schematics in the download section.




## Victron Professional

Get updated with the latest developments and acces our large range of training courses. Succesful completion is rewarded with a certificate.

professional.victronenergy.com




## Victron Community

Search in the knowledge base for questions and answers or ask our large and active community of experienced Victron users.

community.victronenergy.com

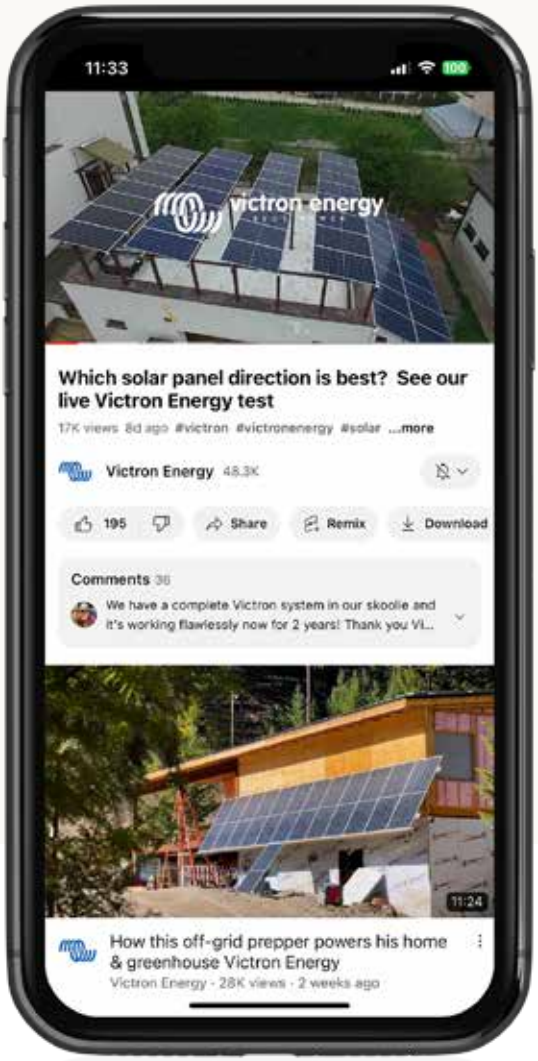



## Victron Energy Blog

Follow interesting cases in great detail, learn about new products and new system design resources.

[victronenergy.com/blog](victronenergy.com/blog)

https://professional.victronenergy.com/news/




## Youtube

Follow our youtube channel to see interesting case videos and field tests. Learn from instruction video's, Q&A sessions and new product introductions.

[youtube.com/victronenergybv](youtube.com/victronenergybv)

# Experience the power of Victron Energy monitoring




Works with

VictronConnect app

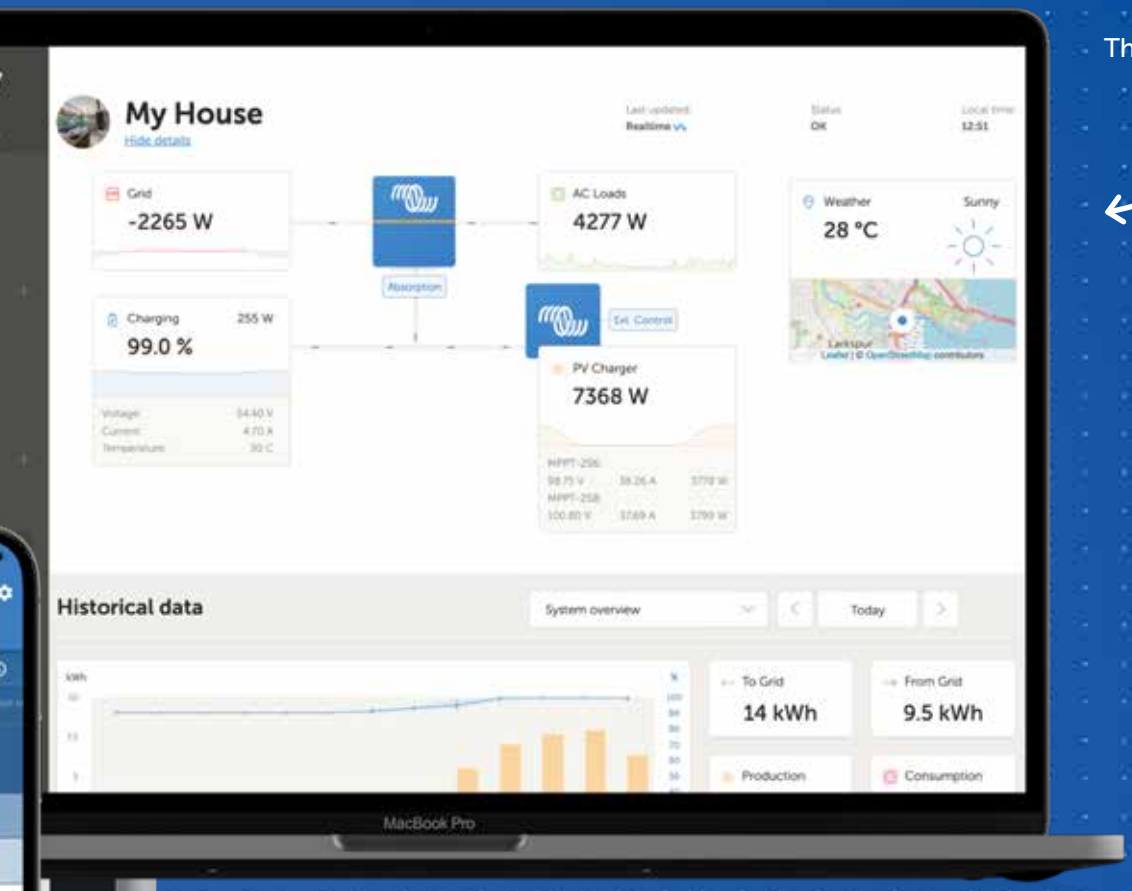
VRM - Remote Management portal

MFD & NMEA 2000 integration

More than 1 million users wordwide

**Energy. Anytime. Anywhere.**

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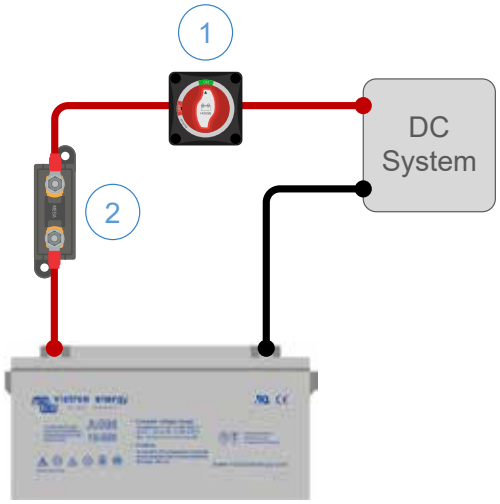



The VRM platform is free to use

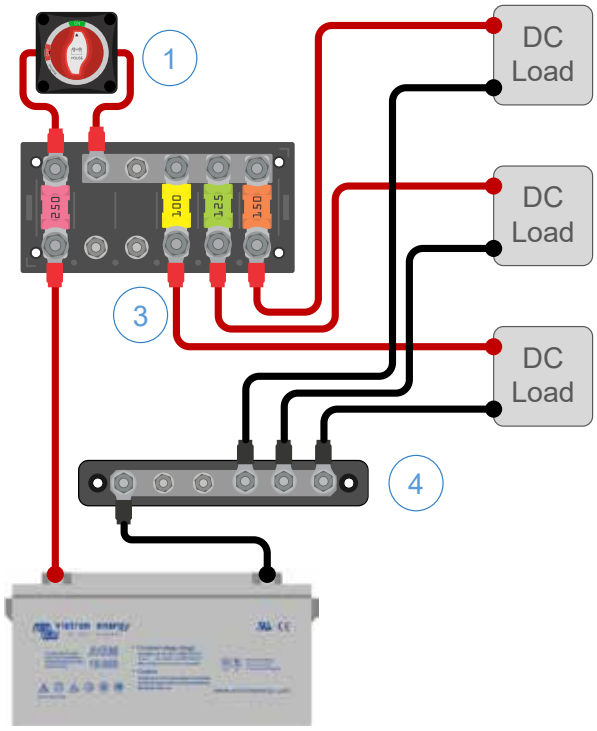
Bring the best of Victron systems together in a powerful experience that will redefine life offegrid. Thanks to the know-how that powers our connected products, you can monitor and control your systems, prevent issues and resolve challenges straight from our VictronConnect App and VRM portal. With the most up-to-date monitoring solution on the planet you can manage it all from anywhere in the world.

See our monitoring solutions in action at **victronenergy.com/monitoring**

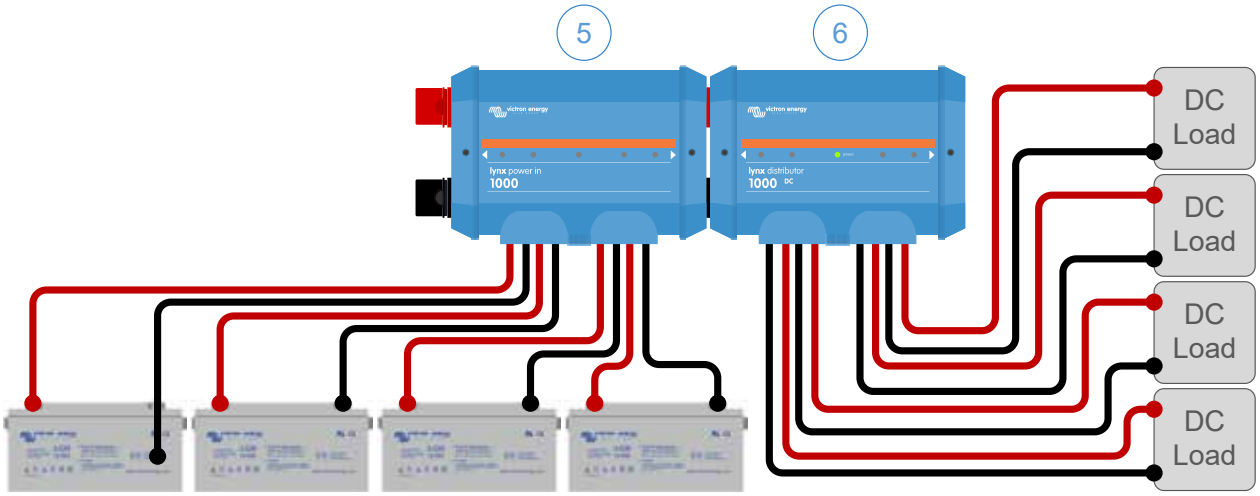
## Battery system with DC fuse, DC battery switch and DC loads.



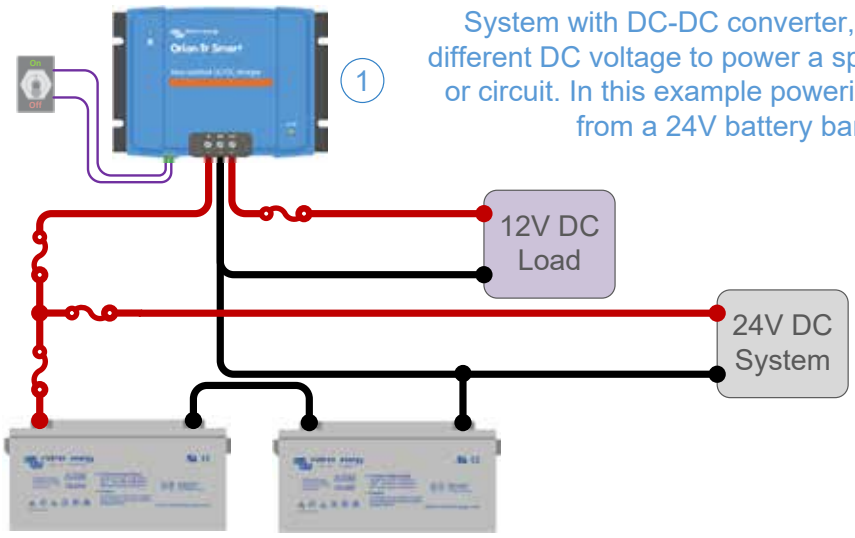

## Battery system with Busbar, fuse box and DC loads.




## Lynx DC distribution system.

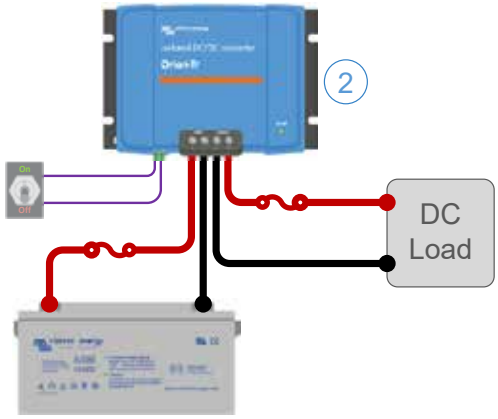


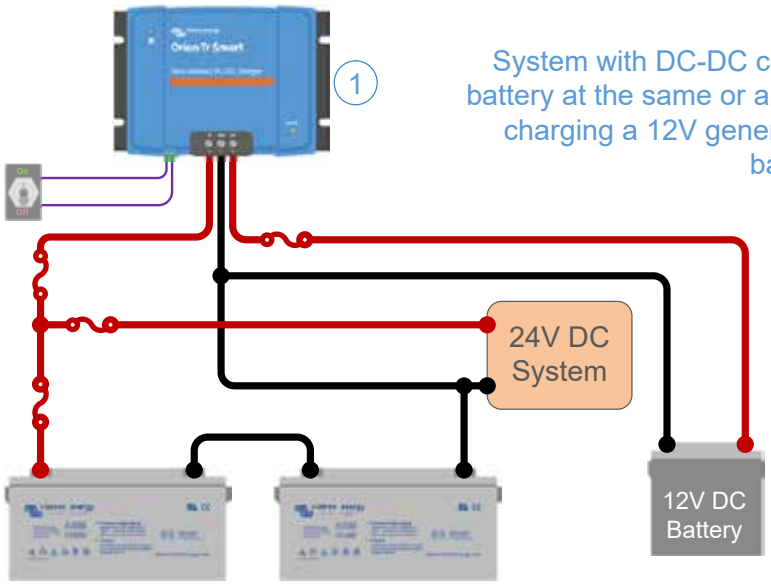

| ID | ITEMS AND NOTES |
|---|---|
| 1 | Battery Switch, rated 275A, suitable for 12, 24 or 48V systems. |
| 2 | Fuse holder with fuse. |
| 3 | Fuse box 6-way with a 250A busbar. |
| 4 | Busbar, available in 150, 250 or 600A rating. A variety of models are available with 4 up to 12 connection points. |
| 5 | Lynx Power In, contains a 1000A positive and negative busbar with connection points for 4 batteries or battery banks. |
| 6 | Lynx Distributor, contains a 1000A positive and negative busbar with connections for 4 fuses and their DC circuits. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |




System with DC-DC converter, providing a different DC voltage to power a specific DC load or circuit. In this example powering 12V loads from a 24V battery bank.

System with DC-DC converter, providing galvanic isolation between the battery and the DC load or circuit.

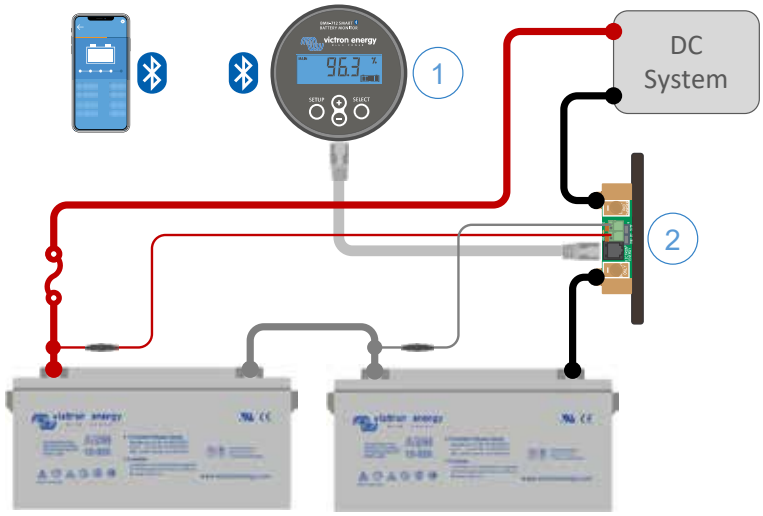


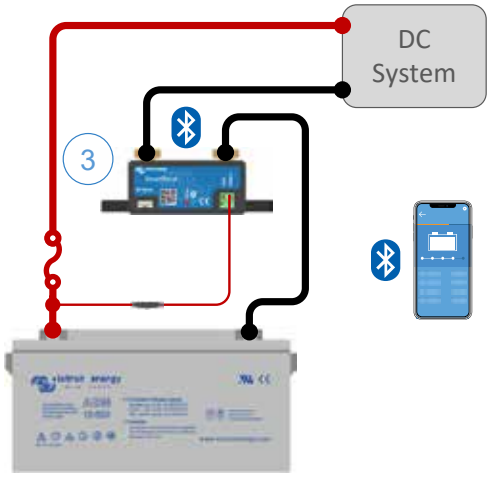

System with DC-DC converter, charging an additional battery at the same or a different voltage. In this example charging a 12V generator starter battery from a 24V battery bank.

| ID | ITEMS AND NOTES |
|---|---|
| 1 | Orion DC-DC Converter, isolated or non isolated, converts one voltage to another, can also be used to charge a battery. |
| 2 | Isolated Orion DC-DC Converter, a variety of models available with 12, 24 or 48V input and 12 or 24V output. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Remote on/off signal wire. |
| | Optional on/off switch. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

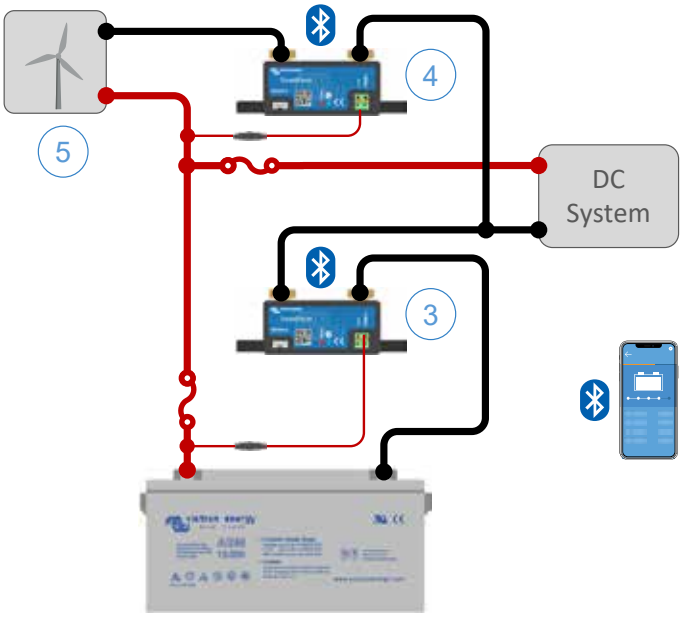
System with a BMV-712 Smart battery monitor. The battery bank is monitored and the auxiliary connection is used to monitor the battery bank midpoint.




System with a SmartShunt battery monitor.

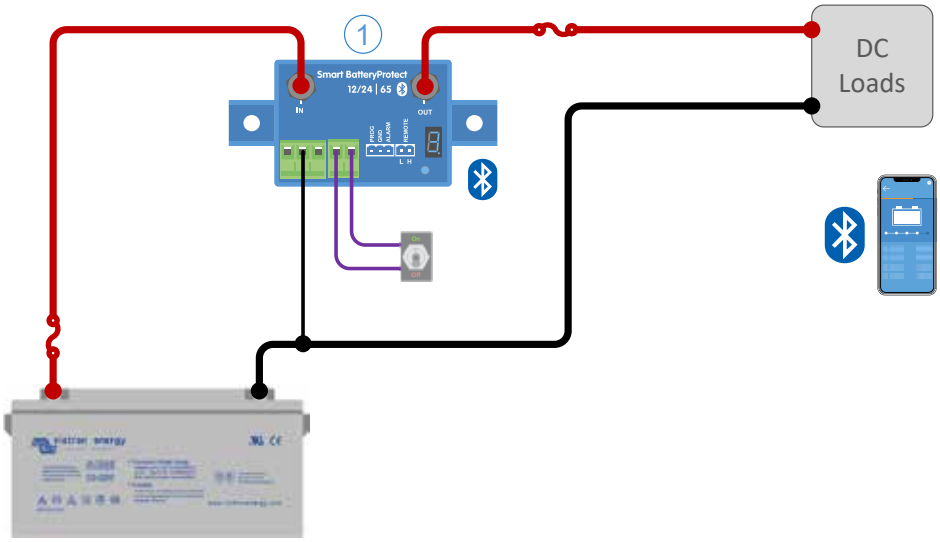



System with a SmartShunt battery monitor and a SmartShunt used as a DC meter.

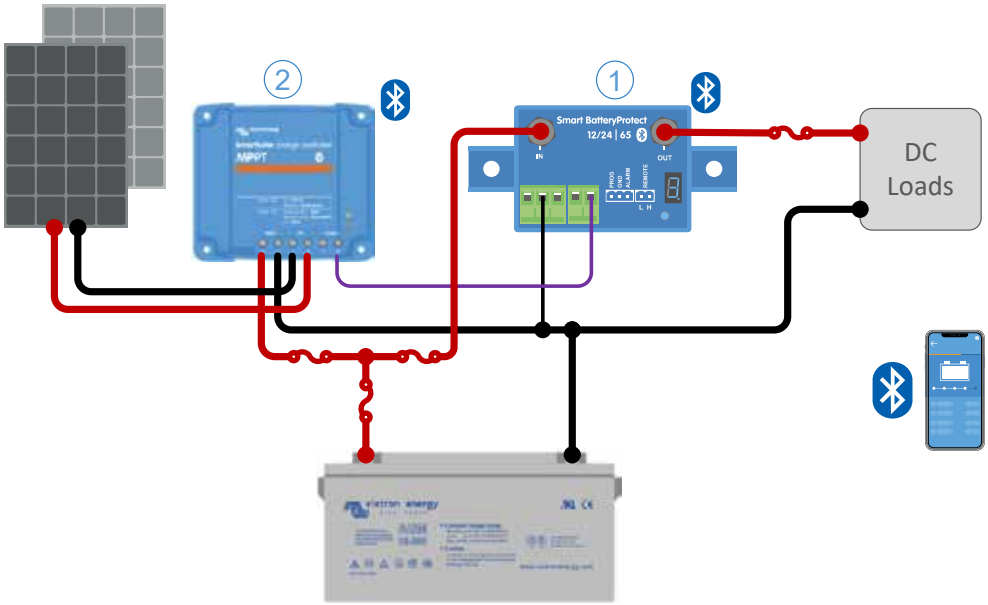



| ID | ITEMS AND NOTES |
|---|---|
| 1 | BMV-712 Smart battery monitor, available in various models, with and without auxiliary connection and/or Bluetooth. |
| 2 | Shunt for the BMV battery monitor, the shunt is included with the battery monitor. |
| 3 | SmartShunt battery monitor, available in a 500A, 100A or 2000A model. |
| 4 | SmartShunt battery monitor configured as a DC meter, to measure the current from a DC charge source or DC load. |
| 5 | DC charge source, in this case a DC wind generator is used. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | RJ12 UTP cable (10m), included with the BMV battery monitor. Also available in lengths ranging from 30cm to 30m. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | Small DC fuse, included with the product. |
| | DC fuse. |

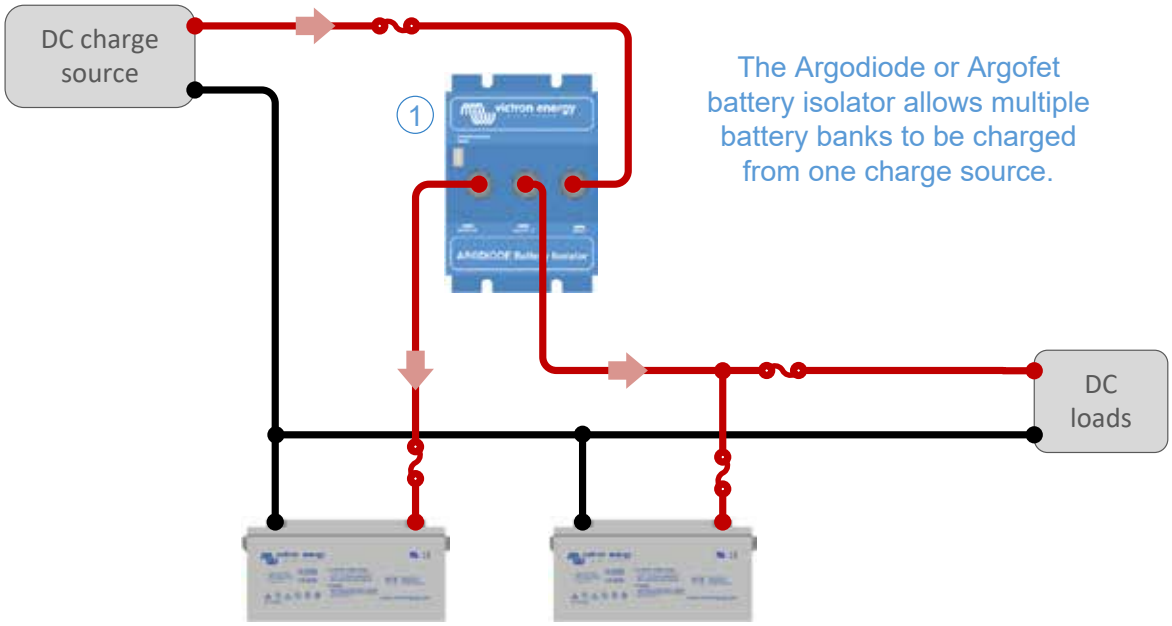
System with a BatteryProtect to protect the battery from being too deeply discharged by a DC load or DC circuit.



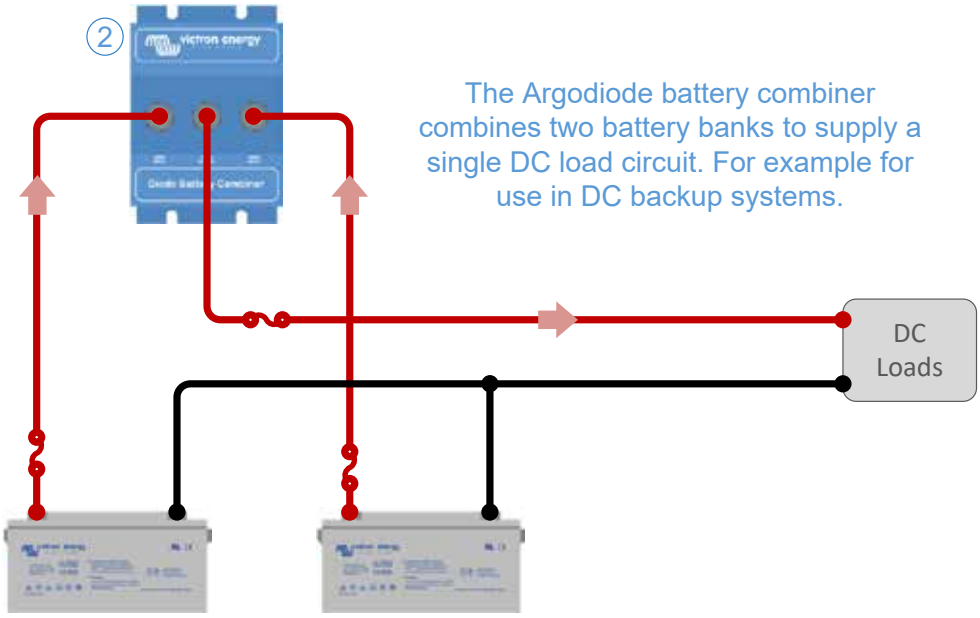

System with a small solar charger. The BatteryProtect is used to increase the load output current rating of the solar charger.




| ID | ITEMS AND NOTES |
|---|---|
| 1 | BatteryProtect, available in 65, 100 or 220A models, for 12, 24 or 48V, with or without Bluetooth. |
| 2 | Solar charger with load output, available in 10, 15 or 20A models, for 12, 24 or 48V, with or without Bluetooth. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Solar panel or solar array. |
| | Remote on/off signal wire. |
| | Optional on/off switch. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |



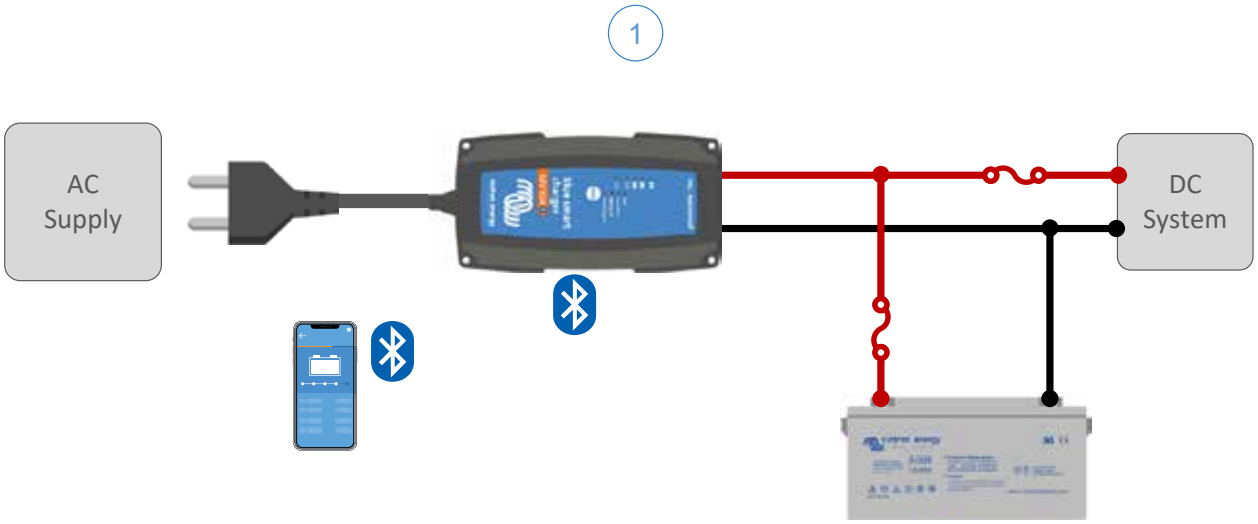

The Argodiode or Argofet battery isolator allows multiple battery banks to be charged from one charge source.



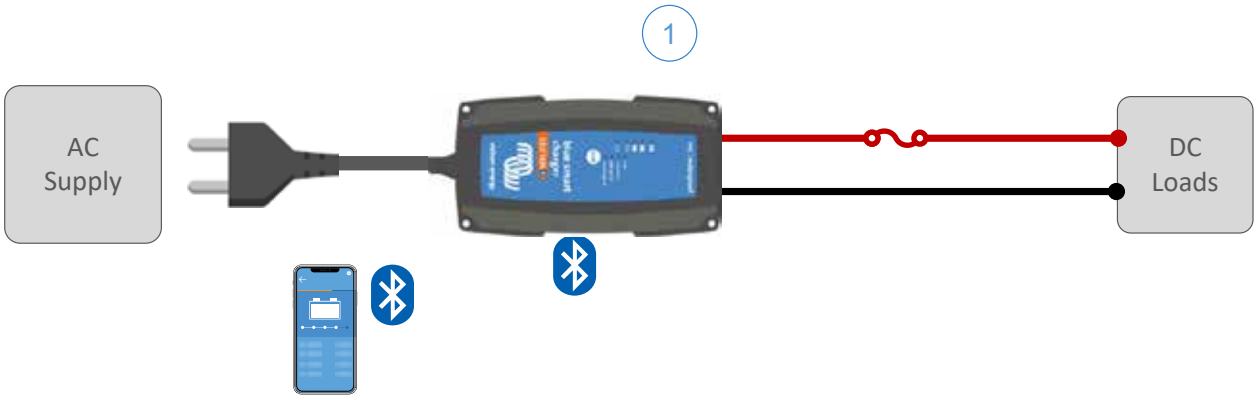

The Argodiode battery combiner combines two battery banks to supply a single DC load circuit. For example for use in DC backup systems.

| ID | ITEMS AND NOTES |
|---|---|
| 1 | Argodiode or Argofet battery isolator, for 2 or 3 batteries, models ranging from 80 up to 200A, for 12 or 24V systems. |
| 2 | Argodiode battery combiner, 40A or 80A model, suitable for 12V or 24V systems. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

Battery charger used to charge a battery and providing power to DC loads.

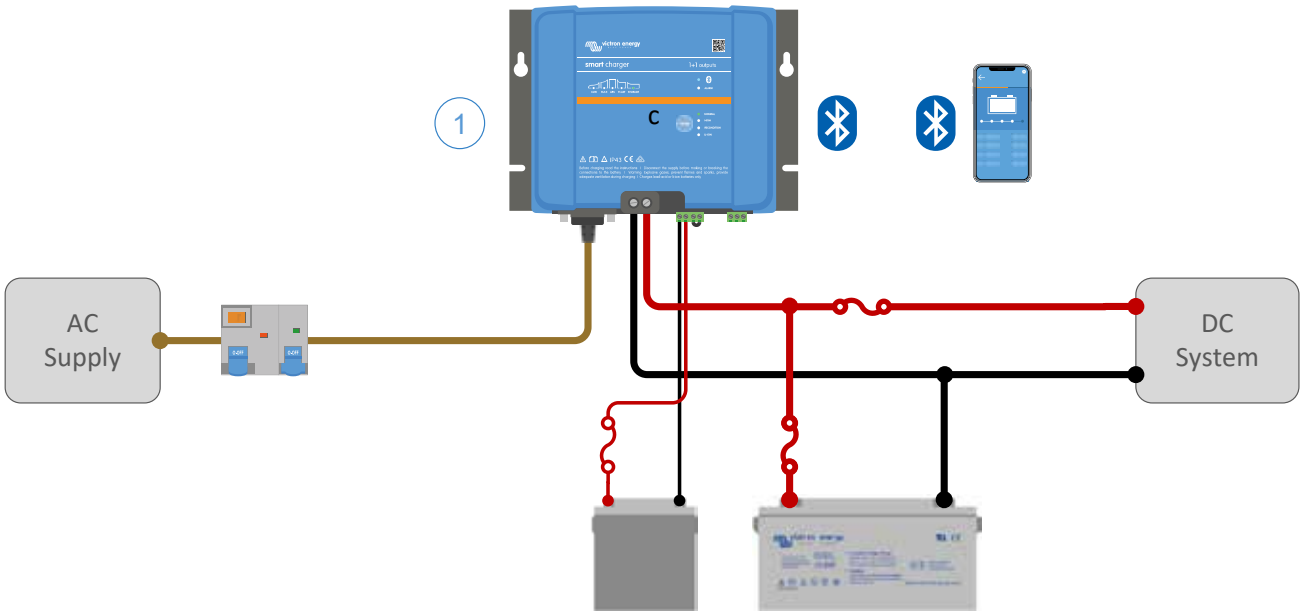



Battery charger used as a power supply.

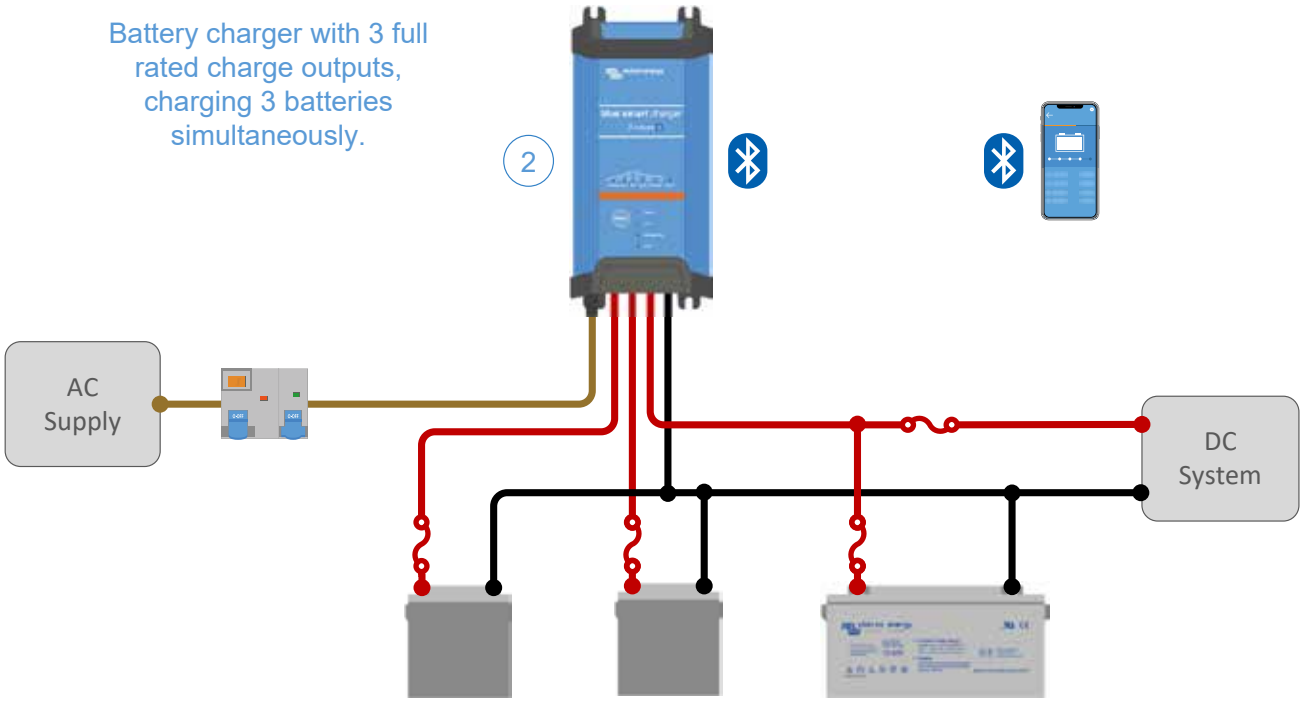



| ID | ITEMS AND NOTES |
|---|---|
| 1 | Blue Smart battery charger, available in 12 or 24V, up to 25A. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | AC plug and cable, available in EUR, UK, USA and AU/NZ versions. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

Battery charger used to charge a main battery and provides a maintenance charge to a smaller battery, like a generator starter battery.

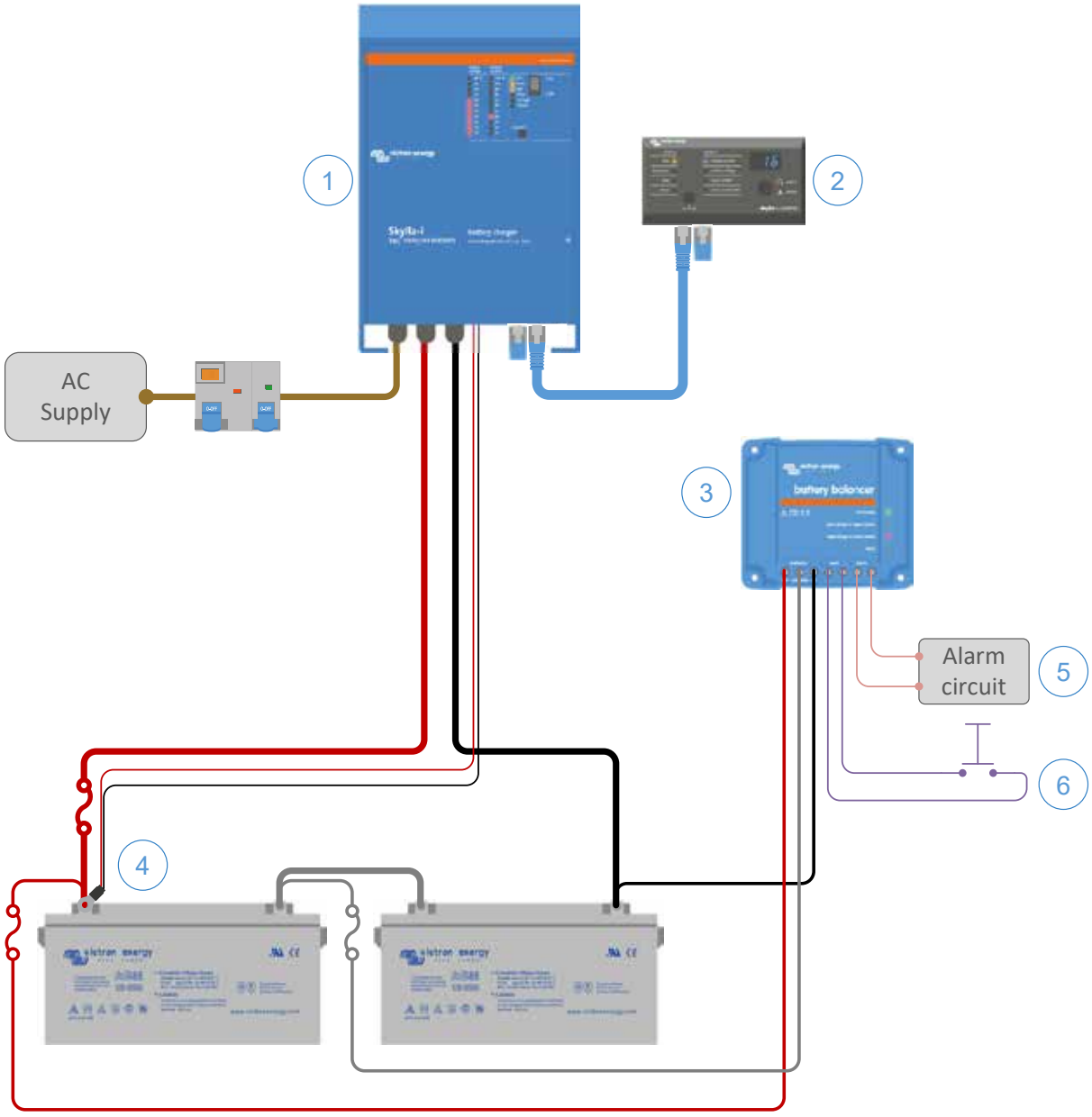



Battery charger with 3 full rated charge outputs, charging 3 batteries simultaneously.

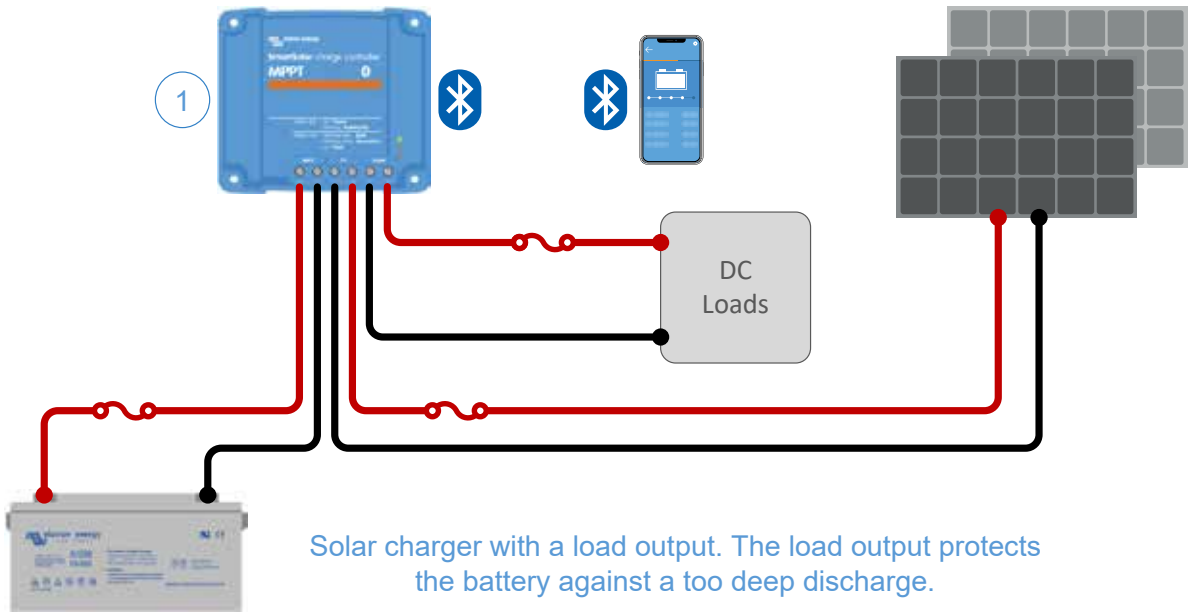



| ID | ITEMS AND NOTES |
|---|---|
| 1 | Smart IP43 Charger, available in 1+1 models and in 3 output models in 12 or 24V up to 50A. |
| 2 | Blue Smart IP22 Charger, available in single output or 3 output models for 12 or 24V up to 30A. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

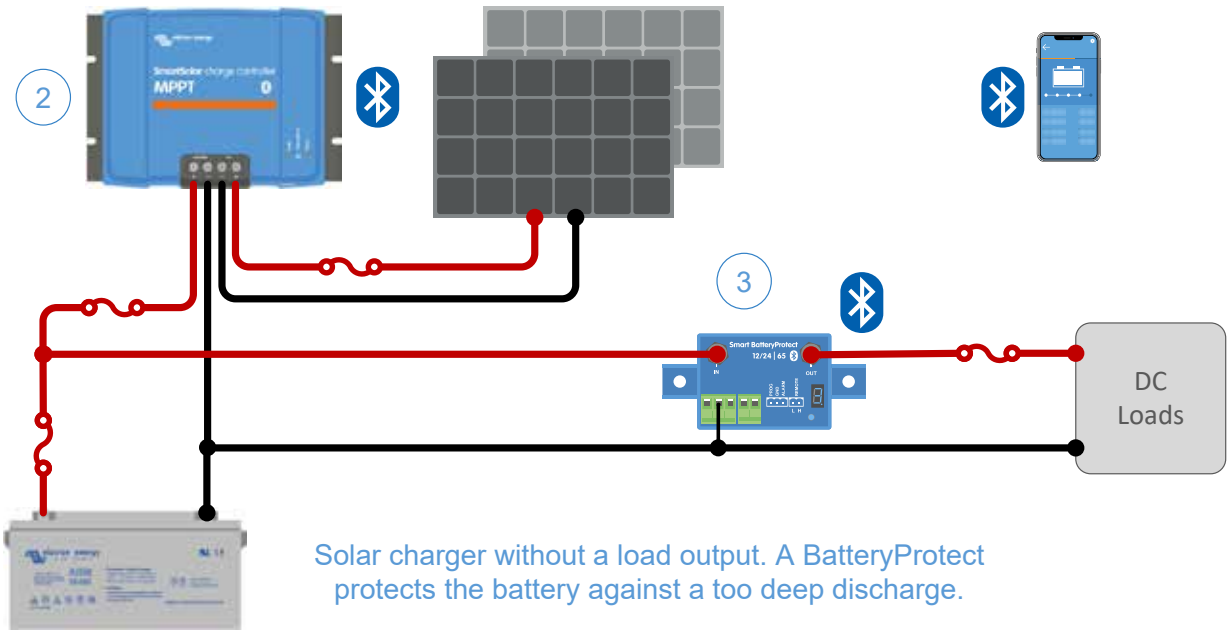
System with a Skylla battery charger and a battery balancer. The battery balancer ensures that both batteries in a 24V system are charged equally.




| ID | ITEMS AND NOTES |
|---|---|
| 1 | Skylla-i battery charger, 24V up to 100A. Or use a Skylla-TG Charger, 24 or 48V up to 100A (also a 3 phase model). |
| 2 | The Skylla-i Control GX monitors and controls the Skylla-i battery charger. |
| 3 | Battery Balancer, can be used in 24 or 48V systems. In case of a 48V system 3 balancers are needed. |
| 4 | Temperature sensor, ships together with the Skylla-i. |
| 5 | Alarm circuit, connected to the battery balancer alarm relay. |
| 6 | Alarm reset switch. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. |
| | VE.Can RJ45 terminator, 2 pieces are included with the VE.Can product. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

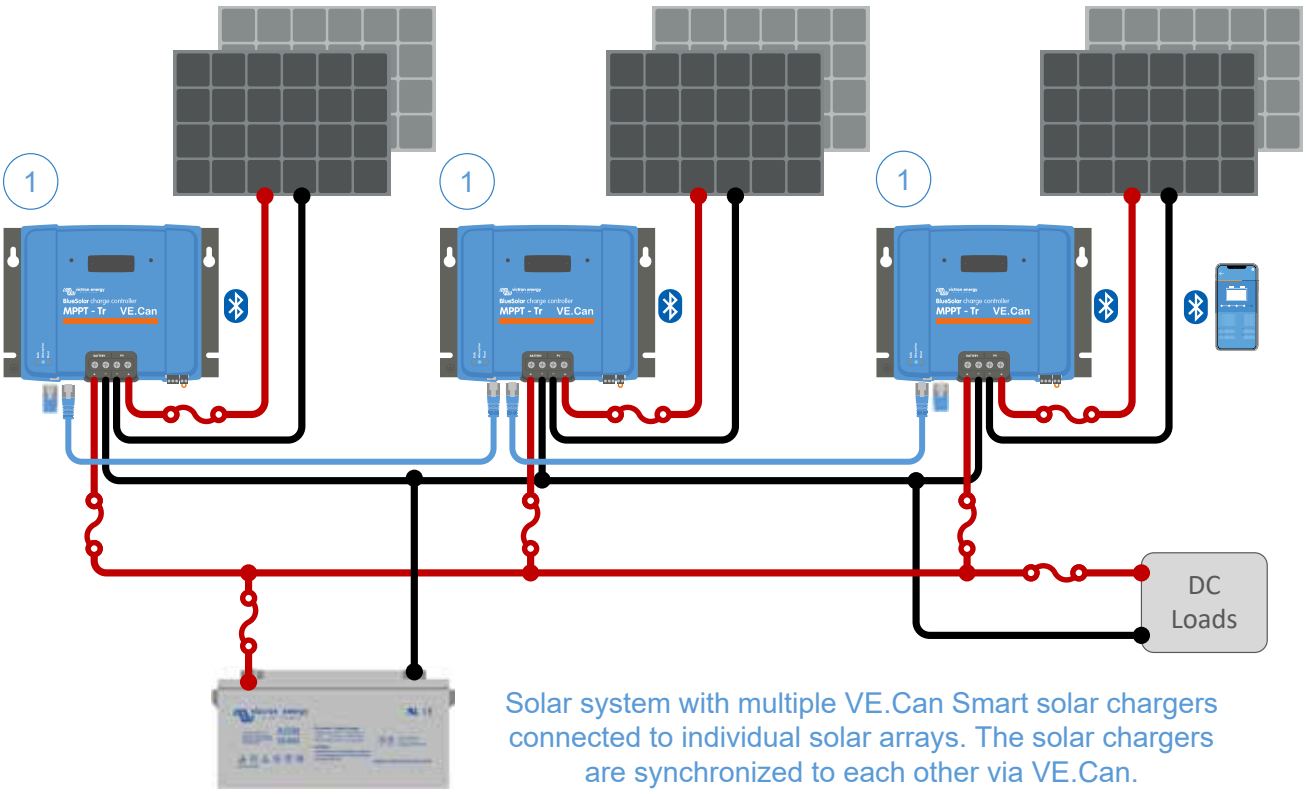



Solar charger with a load output. The load output protects the battery against a too deep discharge.

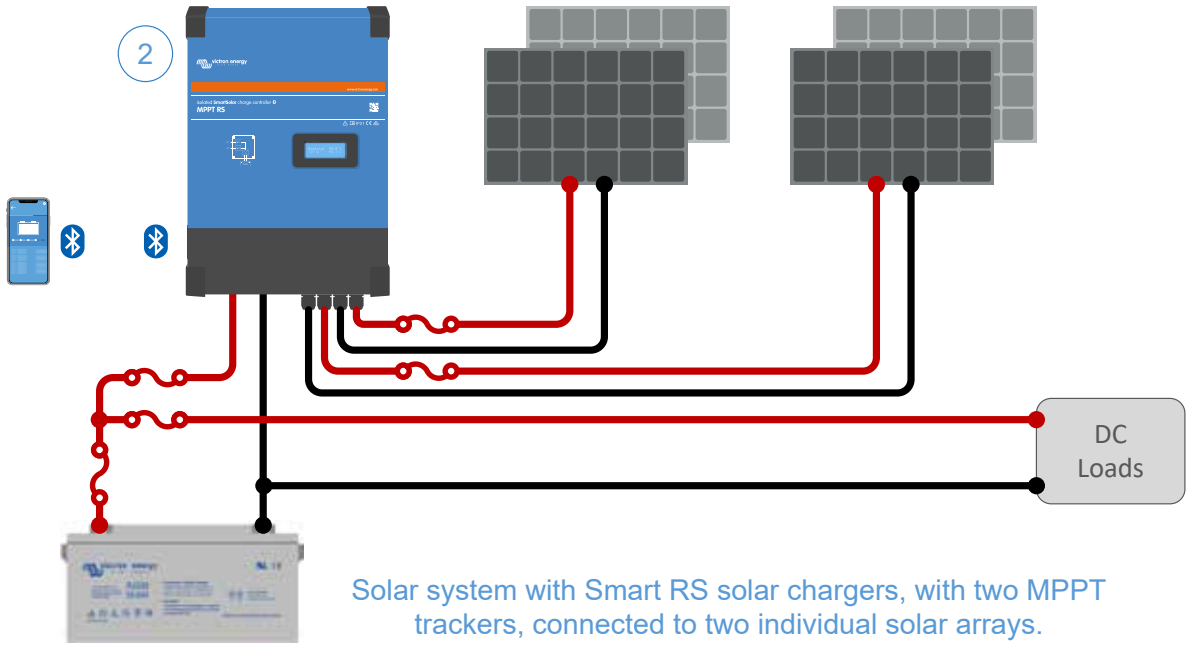



Solar charger without a load output. A BatteryProtect protects the battery against a too deep discharge.

| ID | ITEMS AND NOTES |
|---|---|
| 1 | Solar charger with load output, available in 10, 15 or 20A models, for 12, 24 or 48V, with or without Bluetooth. |
| 2 | Solar charger, available up to 100A, for 12, 24 or 48V, with or without Bluetooth. |
| 3 | BatteryProtect, available in 65, 100 or 220A models, for 12, 24 or 48V, with or without Bluetooth. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Solar panel or solar array. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

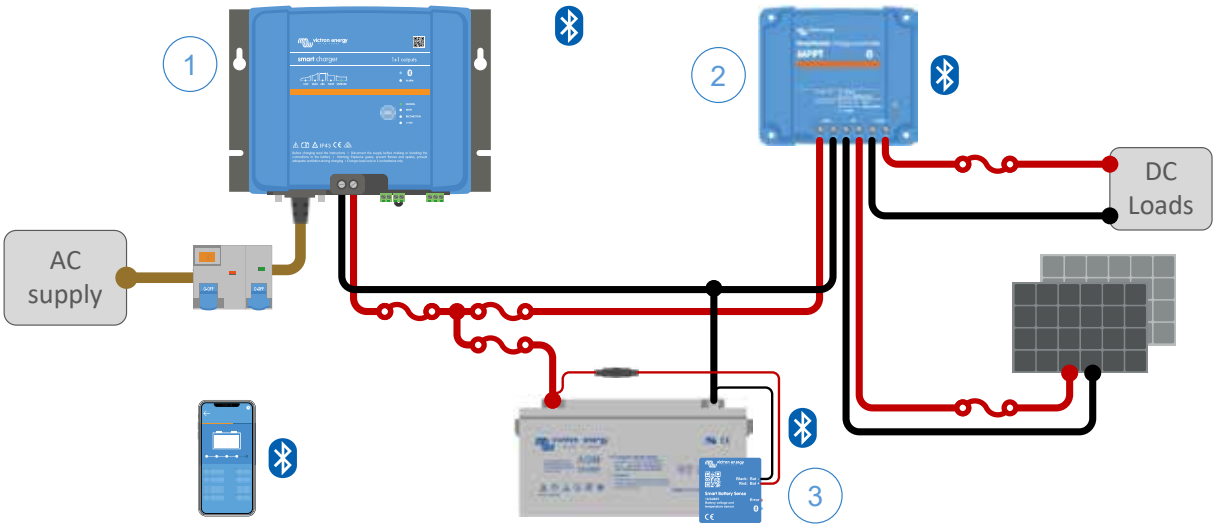



Solar system with multiple VE.Can Smart solar chargers connected to individual solar arrays. The solar chargers are synchronized to each other via VE.Can.

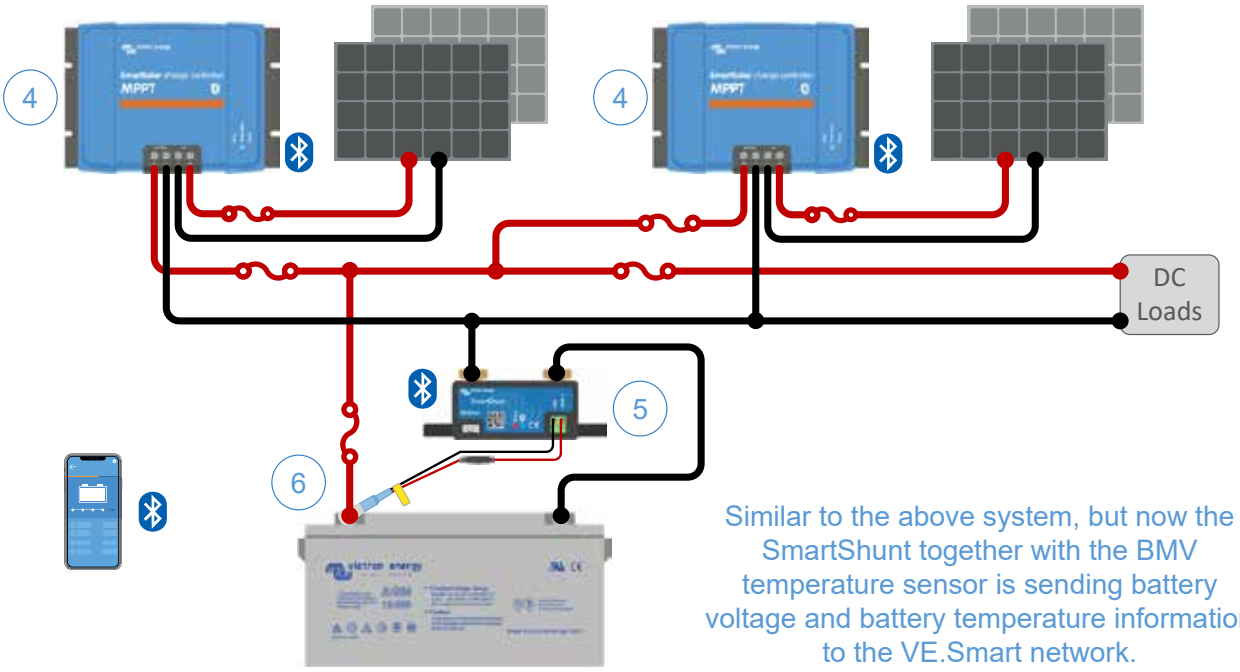



Solar system with Smart RS solar chargers, with two MPPT trackers, connected to two individual solar arrays.

| ID | ITEMS AND NOTES |
|---|---|
| (1) | MPPT SmartSolar VE.Can, for 12, 24 or 48V. Models ranging from 70A up to 100A for PV voltage 150 or 250V. |
| (2) | SmartSolar MPPT RS, for 48V systems, available in a 100A or 200A model, for PV voltages up to 450V. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. |
| | VE.Can RJ45 terminator, 2 pieces are included with the VE.Can product. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Solar panel or solar array. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |



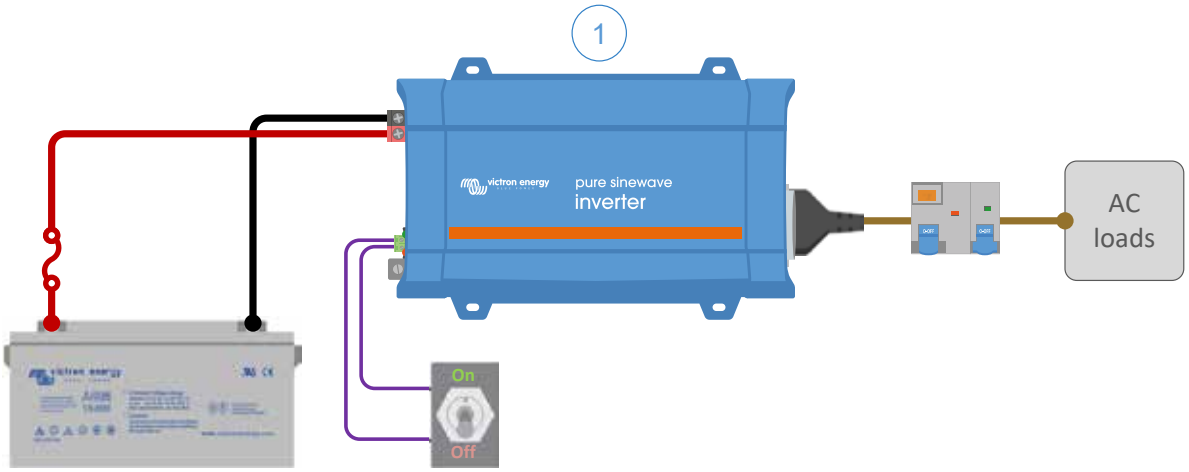

The Smart Battery Sense sends battery temperature and voltage information via Bluetooth and the VE.Smart Network to the solar charger and the AC charger and is used for temperature and voltage compensated charging.



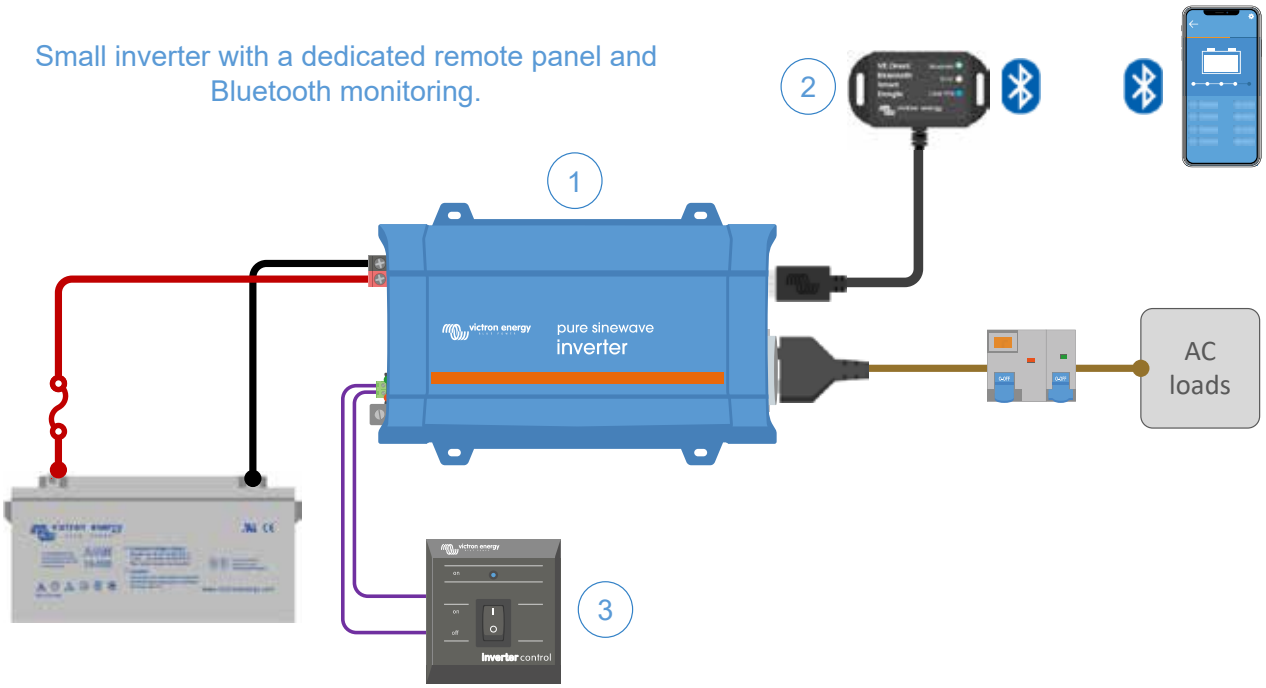

Similar to the above system, but now the SmartShunt together with the BMV temperature sensor is sending battery voltage and battery temperature information to the VE.Smart network.

| ID | ITEMS AND NOTES |
|---|---|
| 1 | 12, 24 or 48V Battery charger. |
| 2 | Solar charger with load output, available in 10, 15 or 20A models, for 12, 24 or 48V, with or without Bluetooth. |
| 3 | Smart Battery Sense, a wireless battery voltage and temperature sensor. |
| 4 | Solar charger, available up to 100A, for 12, 24 or 48V, with or without Bluetooth. |
| 5 | **SmartShunt battery monitor**, available in 500, 100 or 2000A model. |
| 6 | Temperature sensor for BMV-712 Smart and BMV-702. |
| | Phone with the VictronConnect app to set up the smart network and product monitoring via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Solar panel or solar array. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | Small DC fuse, included with the product. |
| | DC fuse. |

## Small inverter with a remote on/off switch.

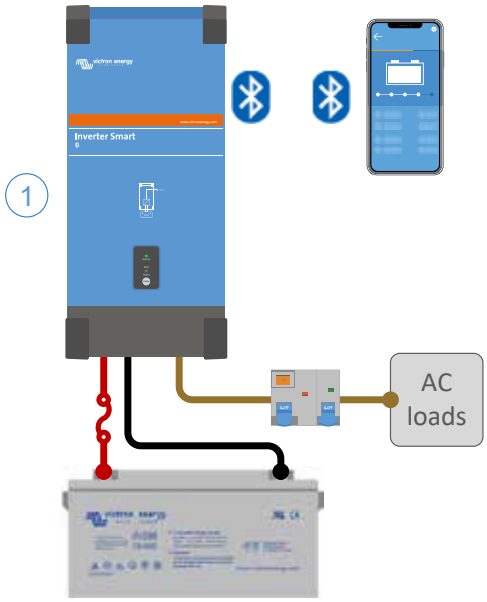



## Small inverter with a dedicated remote panel and Bluetooth monitoring.

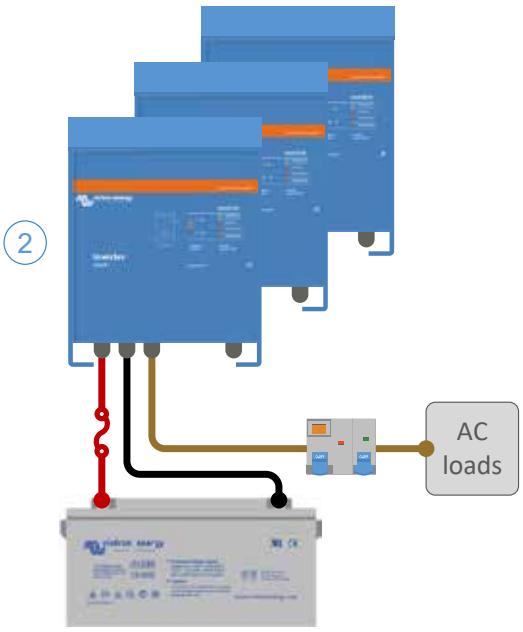



| ID | ITEMS AND NOTES |
|---|---|
| (1) | Inverter VE.Direct, available in 12, 24 or 48V models ranging from 250 up to 1200VA. |
| (2) | VE.Direct Bluetooth Smart dongle to enable a Bluetooth connection to the VictronConnect app. |
| (3) | Inverter Control VE.Direct for on/off control of the VE.Direct inverter. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Optional on/off switch. |
| | Remote on/off signal wire. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

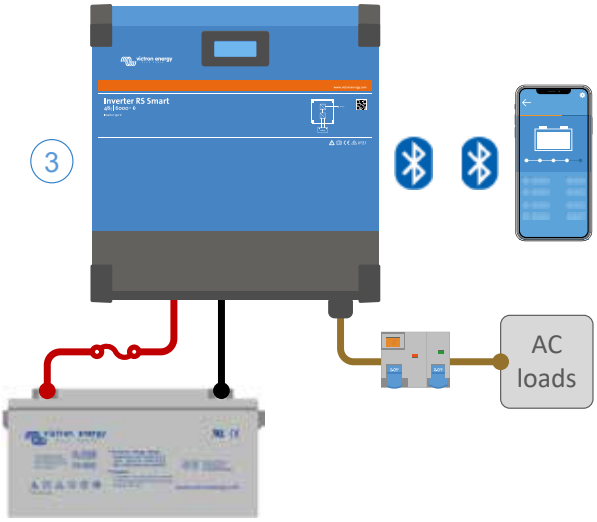
Inverter Smart system.



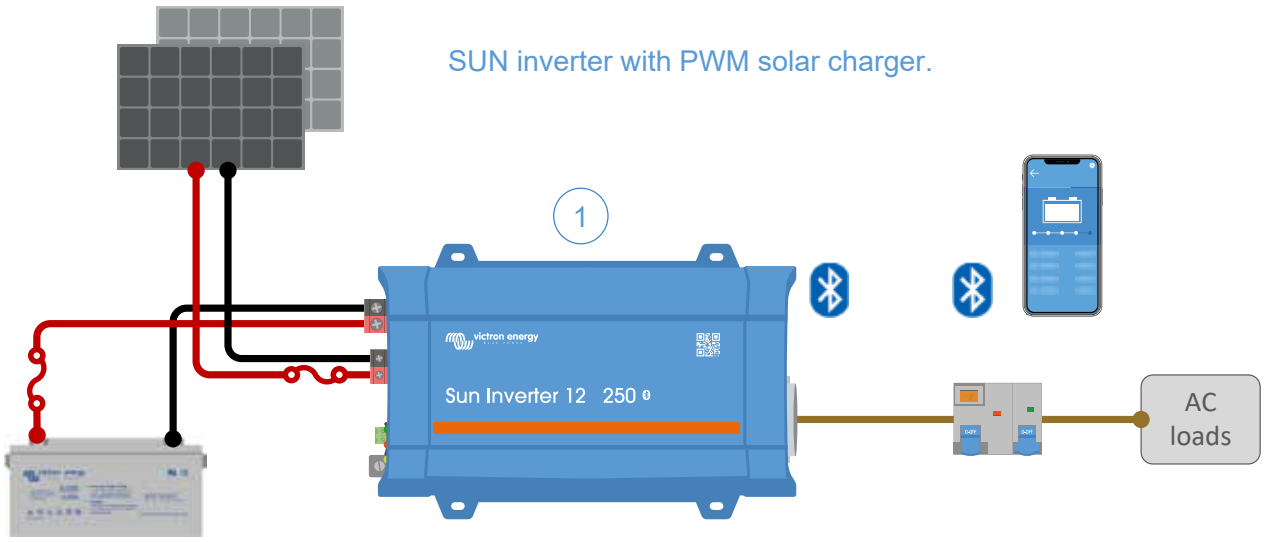

Inverter VE.bus system. Multiple inverters can be connected in parallel and/or in single or 3-phase configurations.

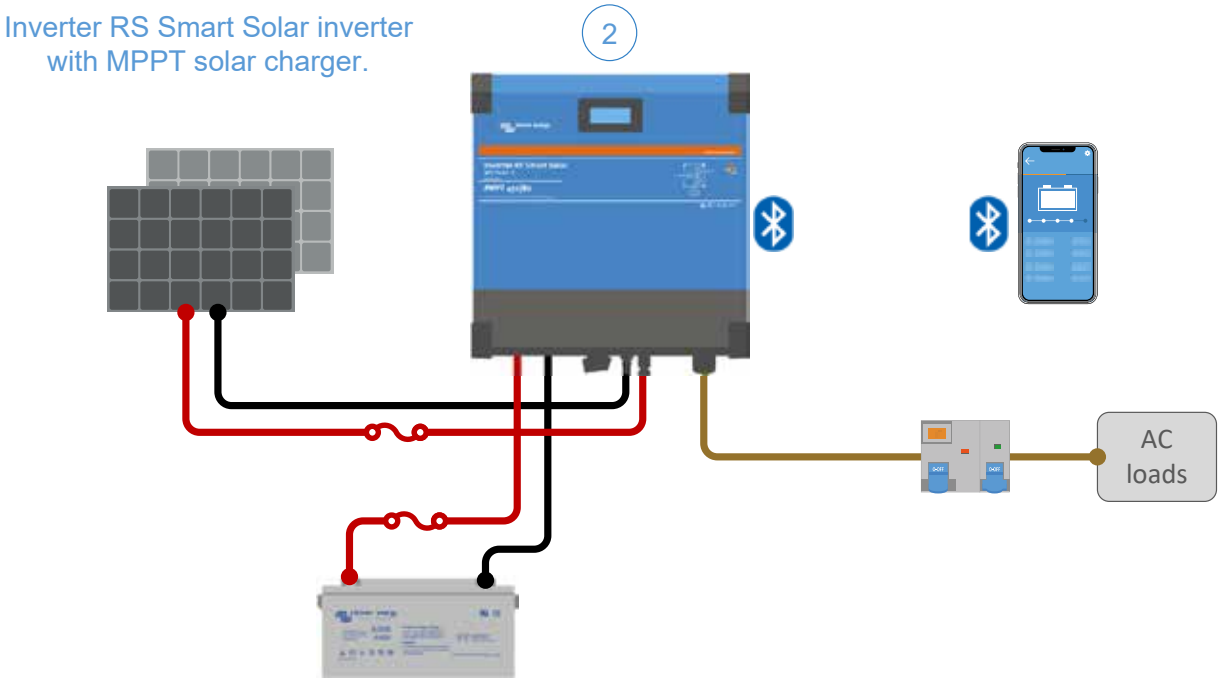



Inverter RS Smart system.



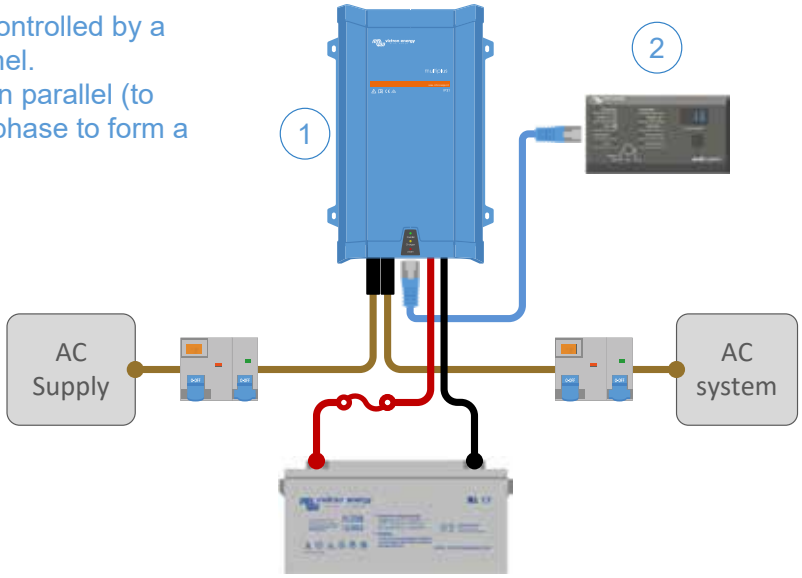

| ID | ITEMS AND NOTES |
|---|---|
| 1 | The Inverter Smart, for 12, 24 or 48V systems, available in models ranging from 1600VA to 5kVA. |
| 2 | The Inverter with VE.bus for 12, 24 or 48V systems, available in a 3 or a 5kVA model. |
| 3 | The Inverter RS Smart for 48V systems, available in a 6kVA model. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |



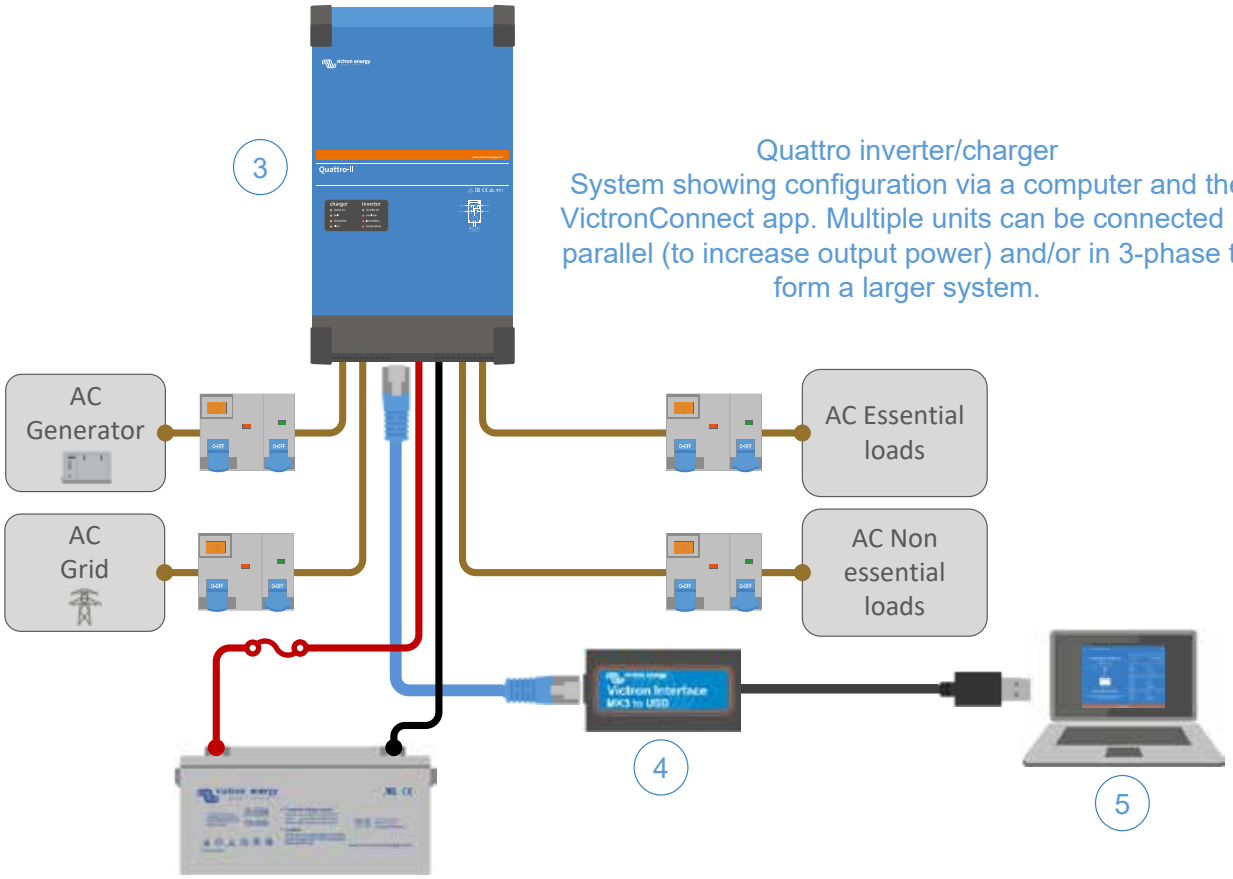




| ID | ITEMS AND NOTES |
|---|---|
| 1 | SUN Inverter, a 12 or 24V, 250VA inverter with a PWM solar charger rated at 15A for 12V or 10A for 24V. |
| 2 | Inverter RS Smart Solar, a 48V, 6kVA inverter with a 80-450Vdc, 4kW MPPT solar charger. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Solar panel or solar array. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

MultiPlus inverter/charger being controlled by a Digital Multi Control panel.
Multiple units can be connected in parallel (to increase output power) and/or in 3-phase to form a larger system.

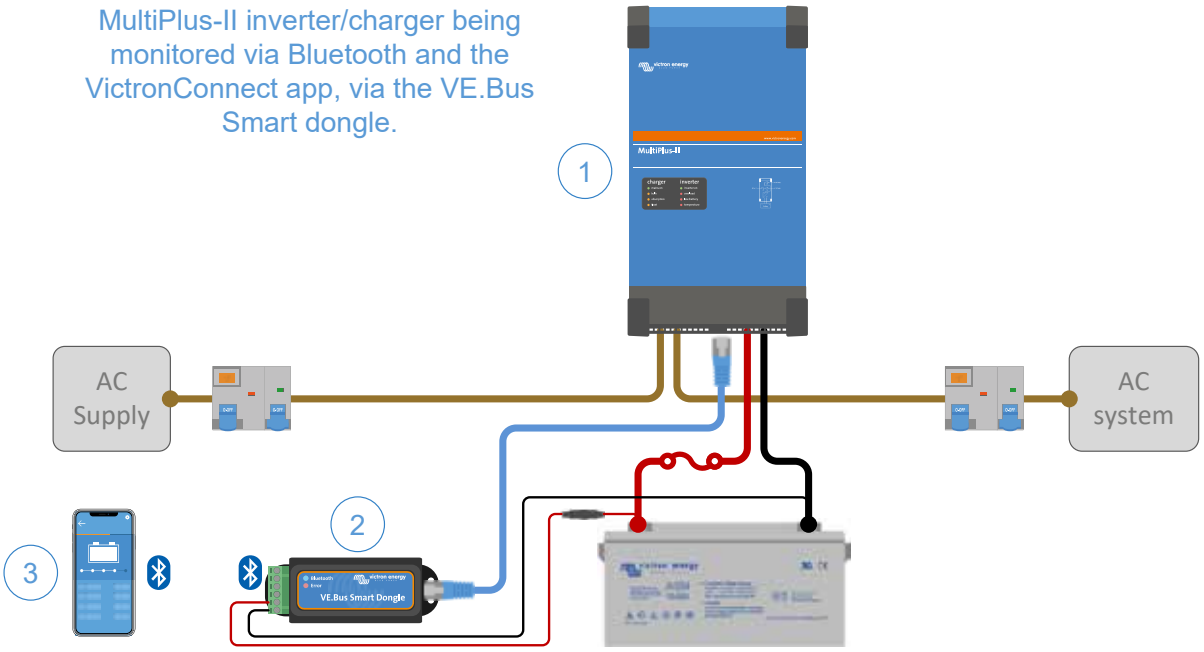



Quattro inverter/charger
System showing configuration via a computer and the VictronConnect app. Multiple units can be connected in parallel (to increase output power) and/or in 3-phase to form a larger system.

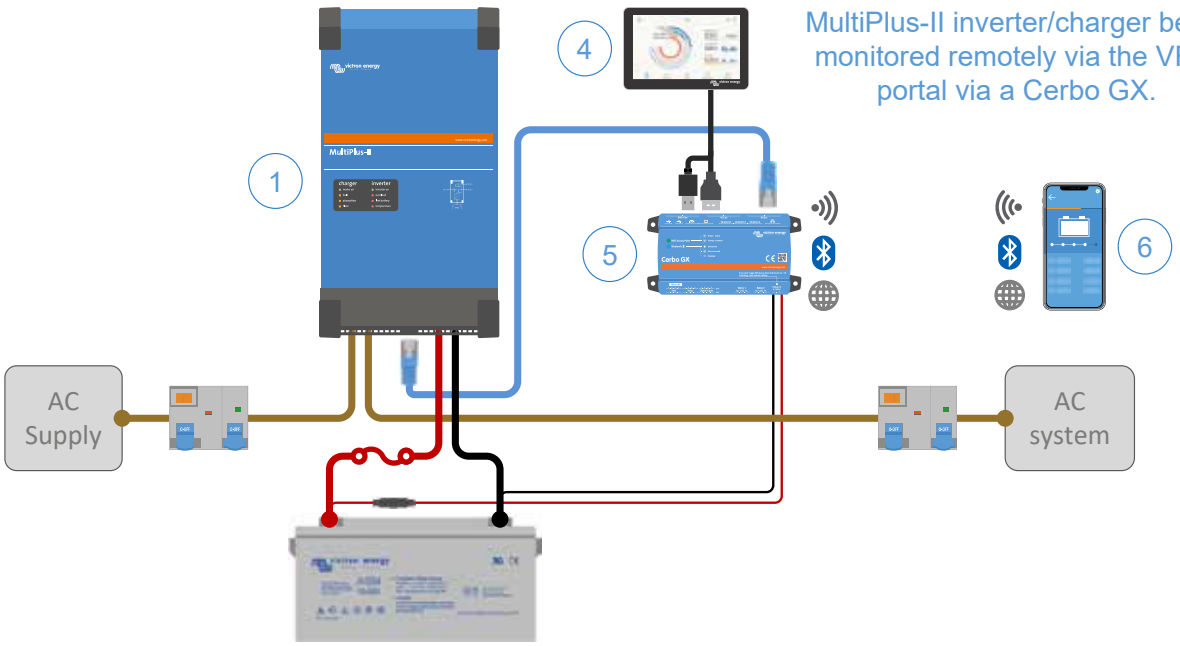



| ID | ITEMS AND NOTES |
|---|---|
| 1 | MultiPlus or MultiPlus-II inverter/charger(s) for 12, 24 or 48V systems, models ranging from 500VA up to 15kVA. |
| 2 | Digital Multi Control 200/200A GX, to remotely view and control the inverter/charger. |
| 3 | Quattro or Quattro-II inverter/charger, for 12, 24 or 48V systems with power rating ranging from 3 up to 15KVA. |
| 4 | Interface MK3-USB for configuration of single and multiple inverter/charger systems via a computer. |
| 5 | Laptop or computer with the VictronConnect app to configure the inverter/charger(s). |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

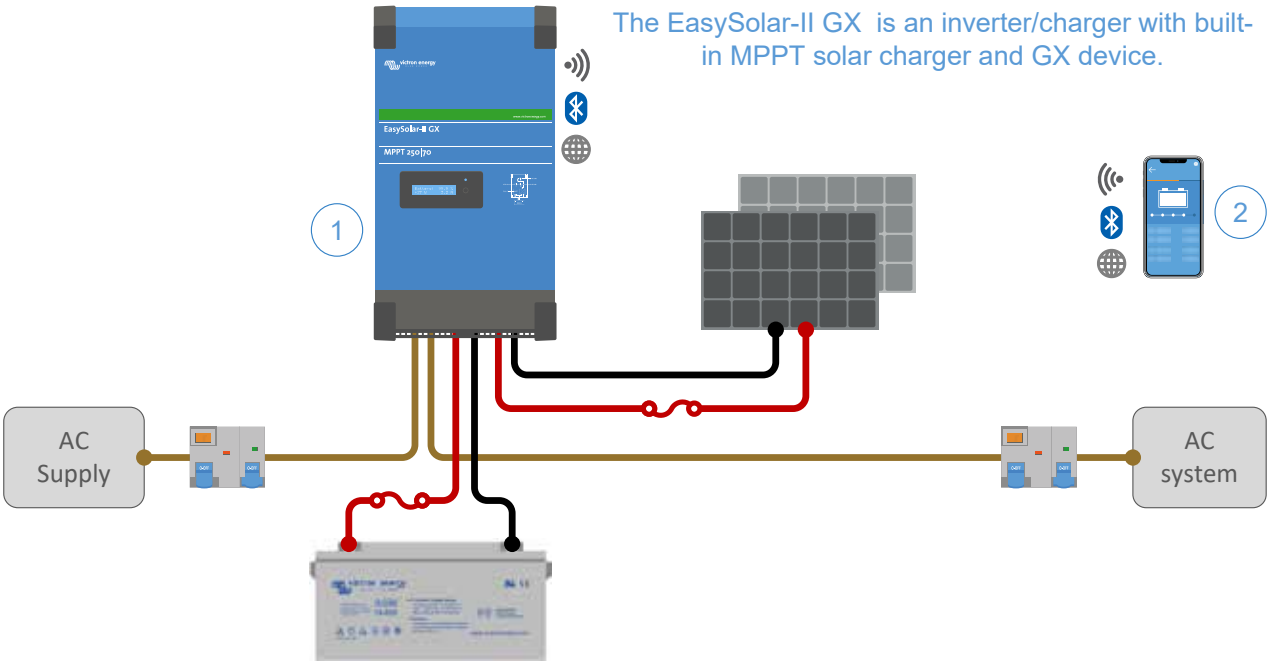
MultiPlus-II inverter/charger being monitored via Bluetooth and the VictronConnect app, via the VE.Bus Smart dongle.

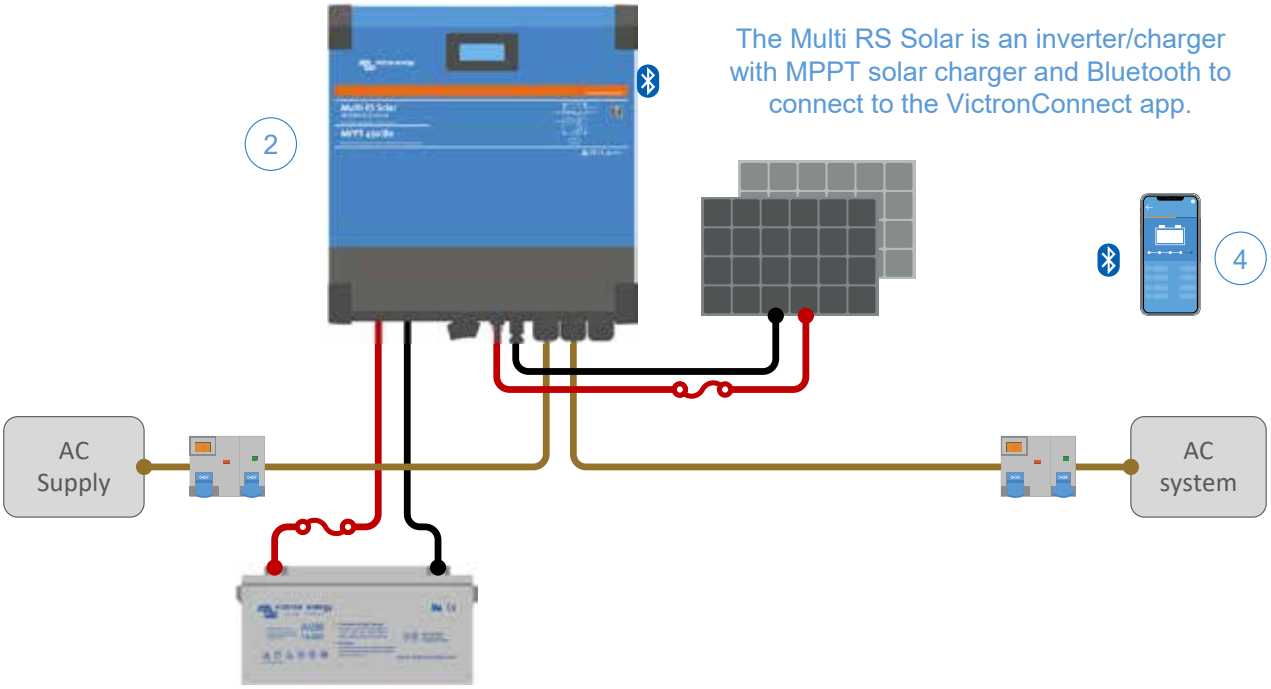



MultiPlus-II inverter/charger being monitored remotely via the VRM portal via a Cerbo GX.

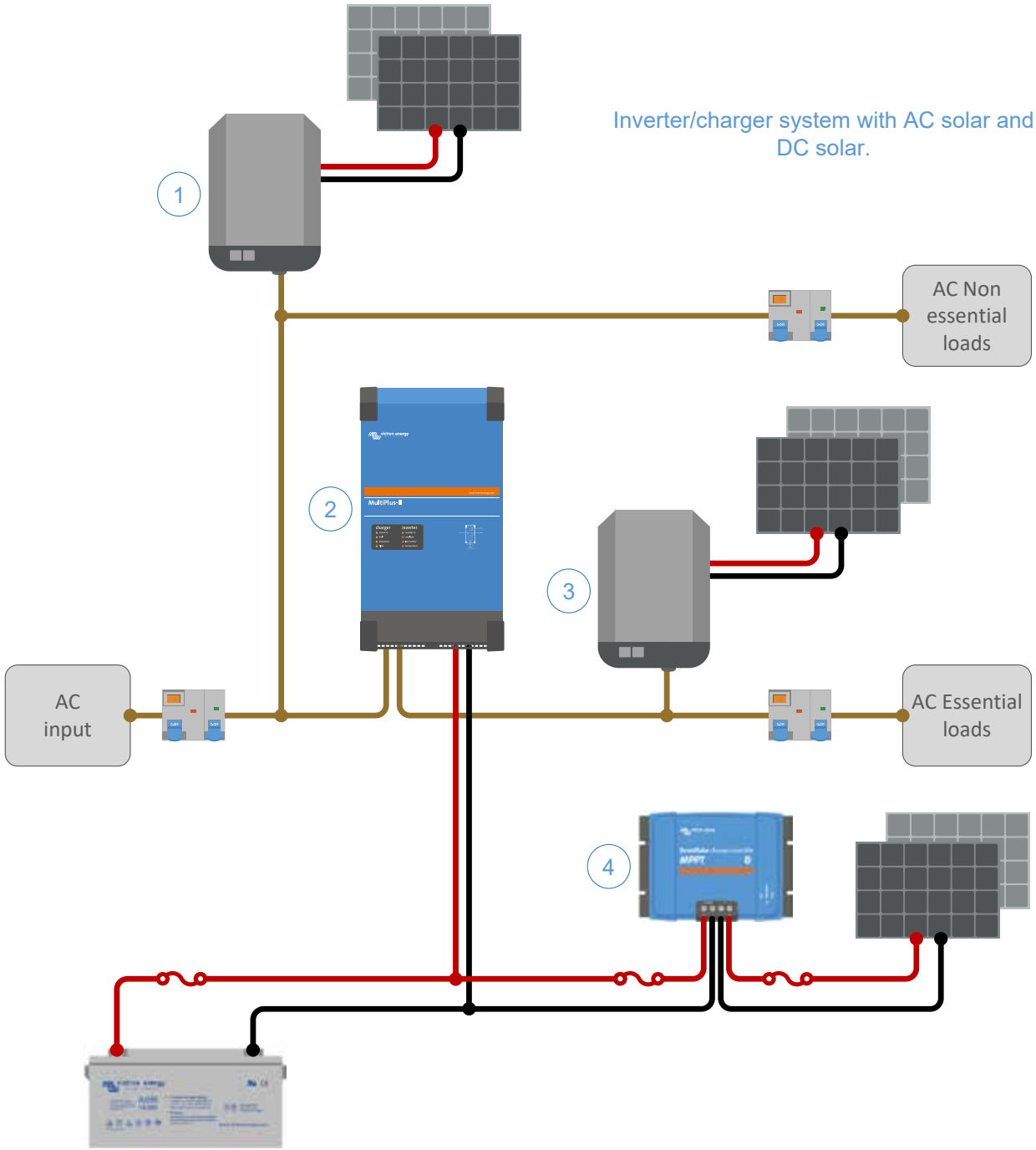



| ID | ITEMS AND NOTES |
|---|---|
| (1) | MultiPlus(-II) or Quattro(-II) inverter/charger for 12, 24 or 48V systems, models ranging from 500VA up to 15kVA. |
| (2) | The VE.Bus Smart dongle for Bluetooth monitoring via the VictronConnect app. |
| (3) | Phone with the VRM app communicating via the internet with the VRM portal. |
| (4) | GX Touch display gives an instant overview of your system. |
| (5) | Cerbo GX for local and remote system monitoring and configuration. |
| (6) | Phone with the VictronConnect app communicating via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Small DC fuse, included with the product. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |



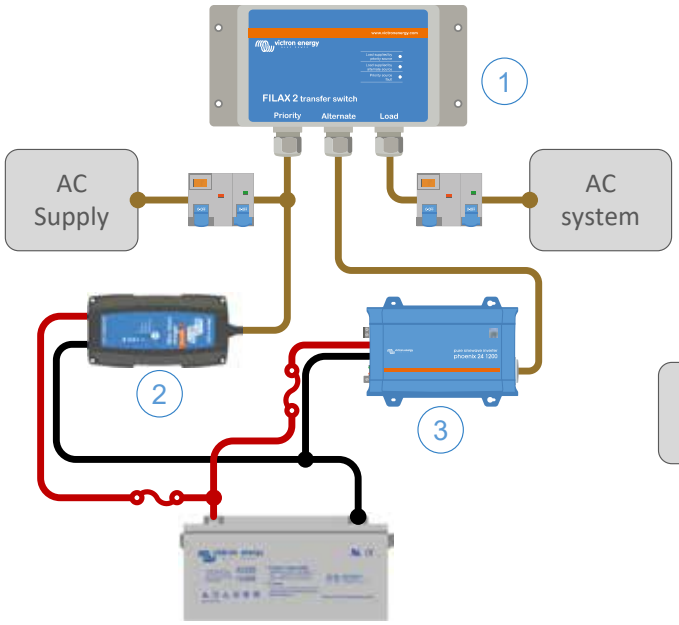




| ID | ITEMS AND NOTES |
|---|---|
| 1 | EasySolar-II GX for 24 or 48V systems, 3 or 5kVA inverter with a 250Vdc, 70A or 100A MPPT solar charger and a GX device. |
| 2 | Phone with the VRM app communicating via the internet with the VRM portal. |
| 3 | Multi RS Solar 48/6000 a 48Vdc, 6kVA, 230Vac Inverter/Charger with 450Vdc 4kWp PV input. |
| 4 | Phone with the VictronConnect app communicating via Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Solar panel or solar array. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

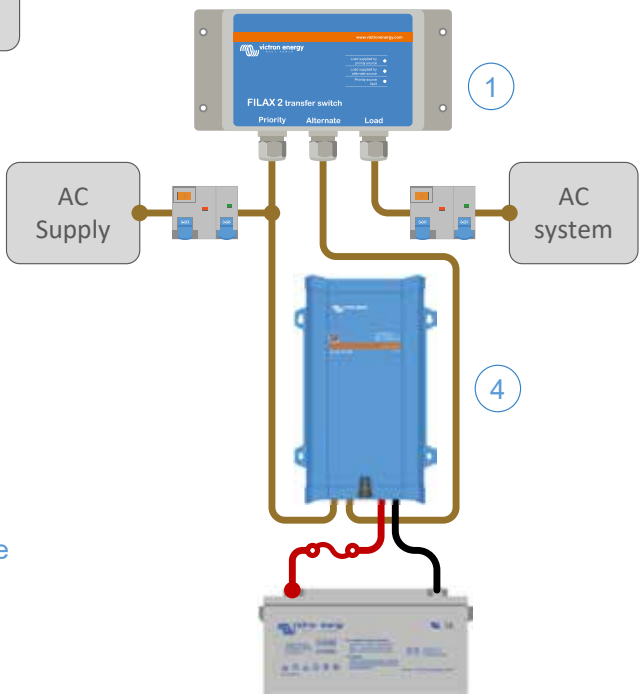



| ID | ITEMS AND NOTES |
|---|---|
| ① | PV inverter, connected to the grid or generator side (input) of the inverter/charger. |
| ② | MultiPlus(-II) or Quattro(-II) inverter/charger for 12, 24 or 48V systems, models ranging from 500VA up to 15kVA. |
| ③ | PV inverter, connected to the ups (output) side of the inverter/charger. |
| ④ | **Solar charger**, available up to 100A, for 12, 24 or 48V, with or without Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Solar panel or solar array. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

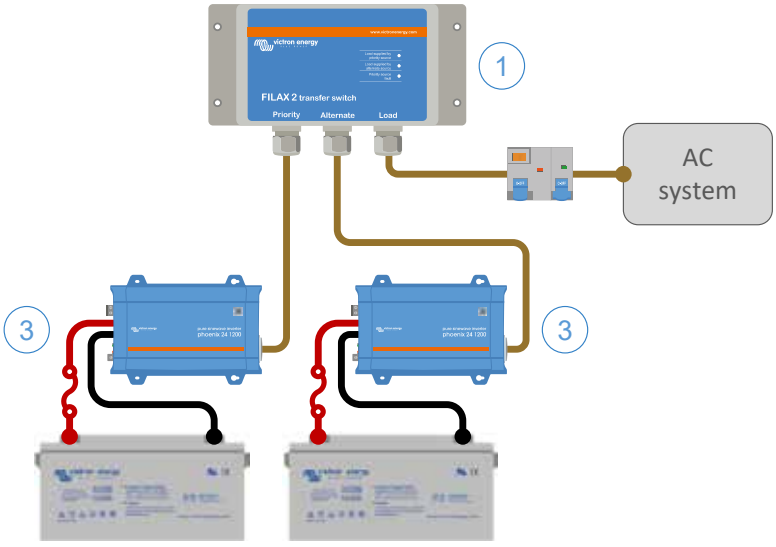
AC backup system, an inverter is the backup for the AC supply (grid or generator). The charger ensures that the battery is charged from the AC supply.



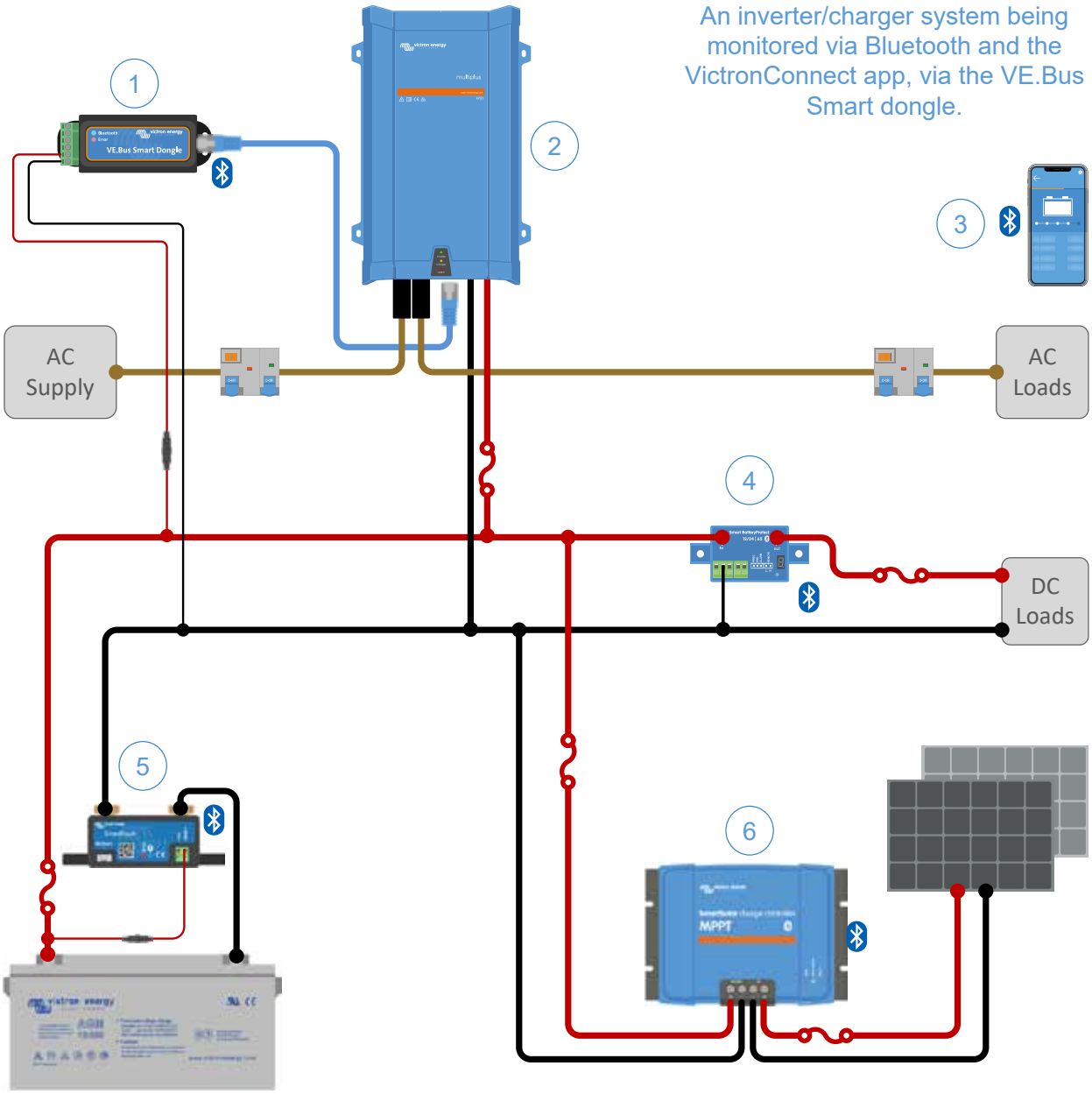

AC backup system, an inverter/charger is the backup for the AC supply (grid or generator).




AC backup system, one inverter is the backup for the other inverter.

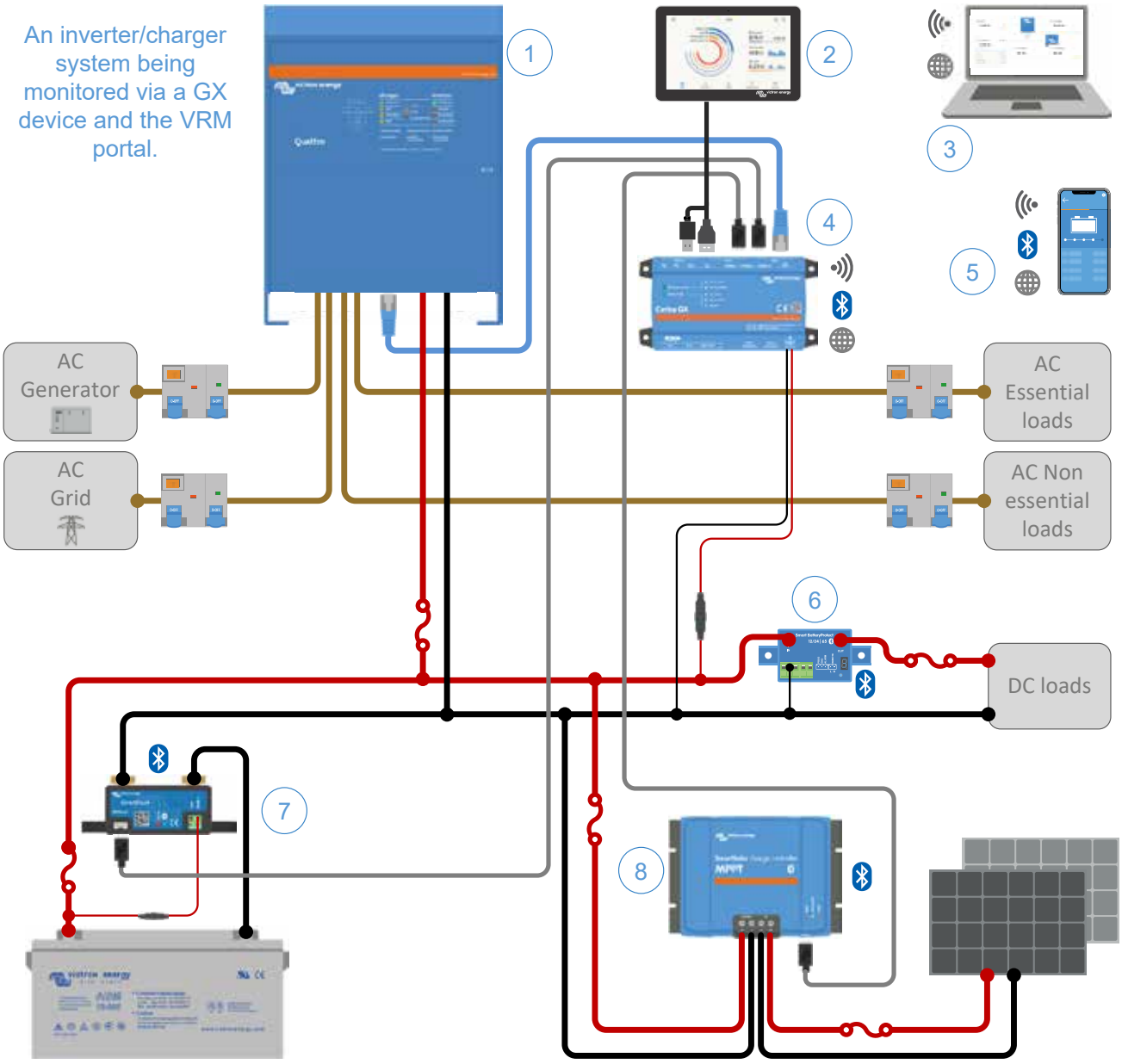



| ID | ITEMS AND NOTES |
|---|---|
| 1 | The Filax 2 is an ultra-fast AC transfer switch, rated to 16A, available in a 230 and a 110Vac model. |
| 2 | Blue Smart battery charger or any other battery charger or solar charger can be used. |
| 3 | Inverter, any model up to 3kVA for 230Vac systems (or 1600VA for 110Vac systems) can be used. |
| 4 | Inverter/charger, any model up to 3kVA for 230Vac systems (or 1600VA for 110Vac systems) can be used. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |

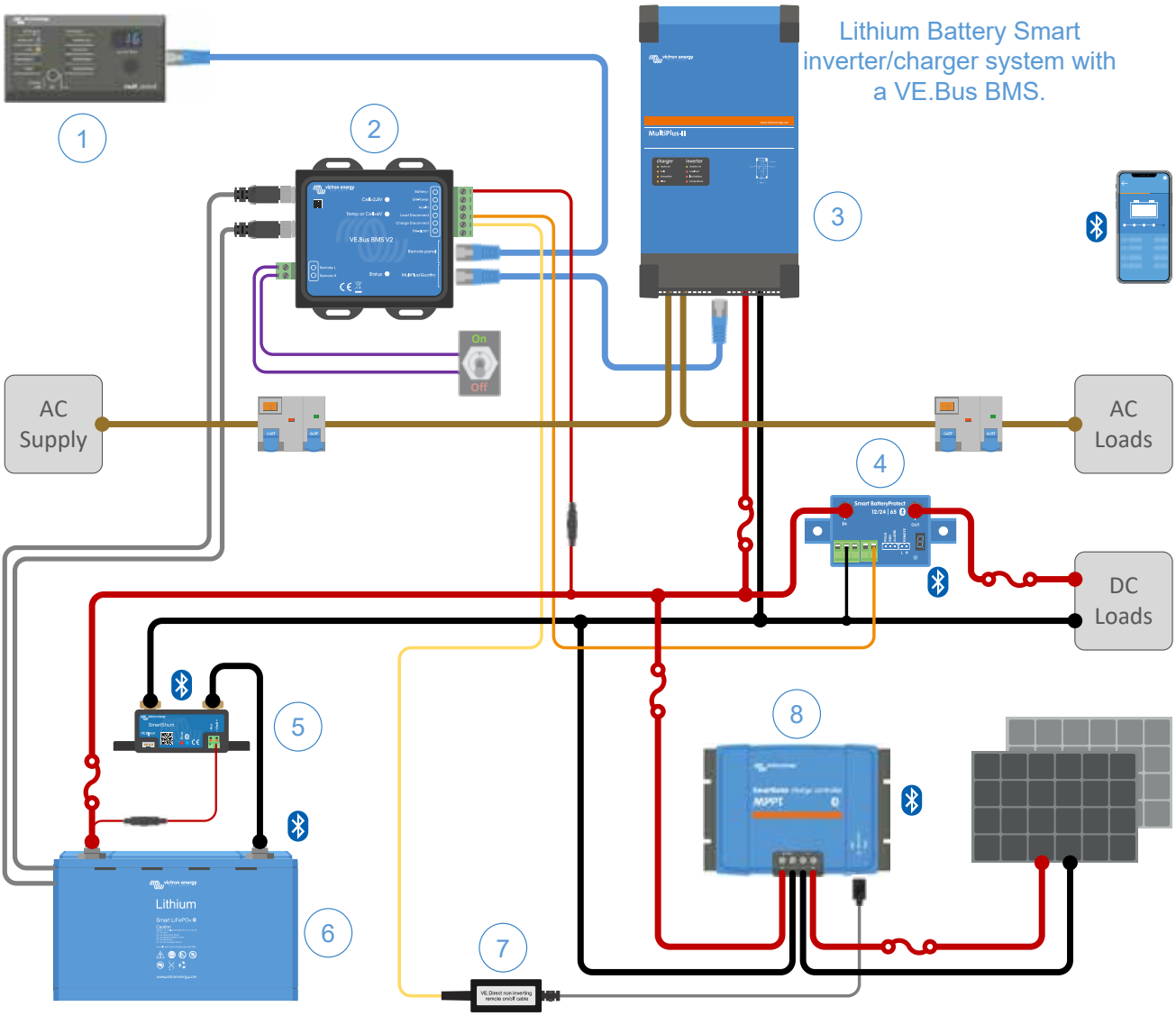



| ID | ITEMS AND NOTES |
|---|---|
| 1 | The VE.Bus Smart dongle for Bluetooth monitoring via the VictronConnect app. |
| 2 | MultiPlus(-II) or Quattro(-II) inverter/charger for 12, 24 or 48V systems, models ranging from 500VA up to 15kVA. |
| 3 | Phone with the VictronConnect app communicating via Bluetooth. |
| 4 | BatteryProtect, available in 65, 100 or 220A models, for 12, 24 or 48V, with or without Bluetooth. |
| 5 | SmartShunt battery monitor, available in 500, 100 or 2000A model. |
| 6 | **Solar charger**, available up to 100A, for 12, 24 or 48V, with or without Bluetooth. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Solar panel or solar array. |
| | RJ45 UTP cable, available in lengths ranging from 30 cm to 30m. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | DC fuse. |
| | Small DC fuse, included with the product. |

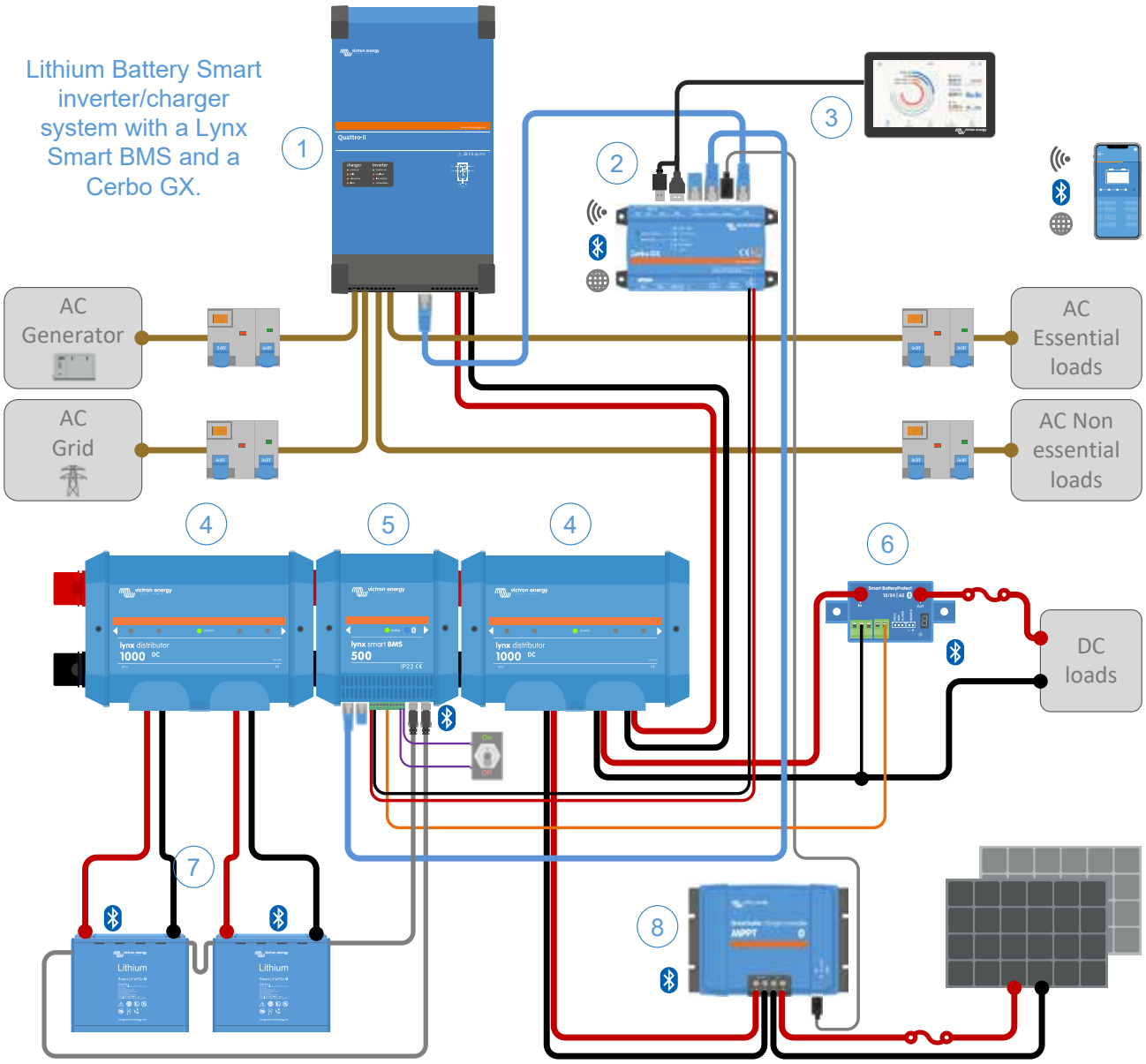
An inverter/charger system being monitored via a GX device and the VRM portal.



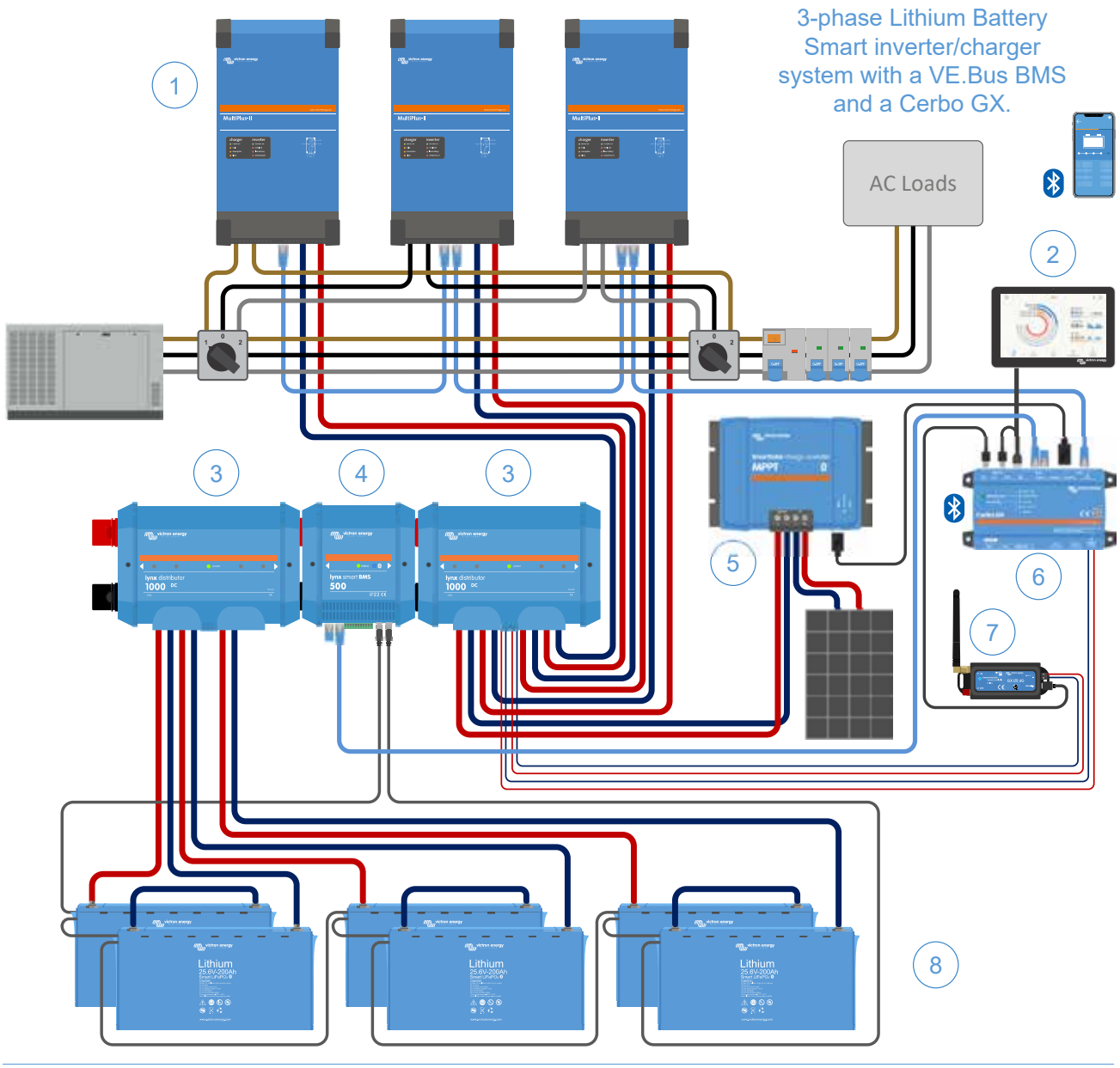

| ID | ITEMS AND NOTES | | |
|---|---|---|---|
| 1 | MultiPlus(-II) or Quattro(-II) inverter/charger for 12, 24 or 48V systems, models ranging from 500VA up to 15kVA. | | |
| 2 | GX Touch display gives an instant overview of your system. | | |
| 3 | Laptop or computer communicating with the VRM portal for remote monitoring and system access. | | |
| 4 | Cerbo GX for local and remote system monitoring and configuration. | | |
| 5 | Phone with the VictronConnect app communicating via Bluetooth and the VRM app communicating via the internet. | | |
| 6 | BatteryProtect, available in 65, 100 or 220A models, for 12, 24 or 48V, with or without Bluetooth. | | |
| 7 | SmartShunt battery monitor, available in 500, 100 or 2000A model. | | |
| 8 | **Solar charger**, available up to 100A, for 12, 24 or 48V, with or without Bluetooth. | | |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. | | |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). | | |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. | | |
| | Solar panel or solar array. | | |
| | VE.Direct cable, available in lengths ranging from 30cm to 10m. | | DC fuse. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. | | Small DC fuse, included with the product. |



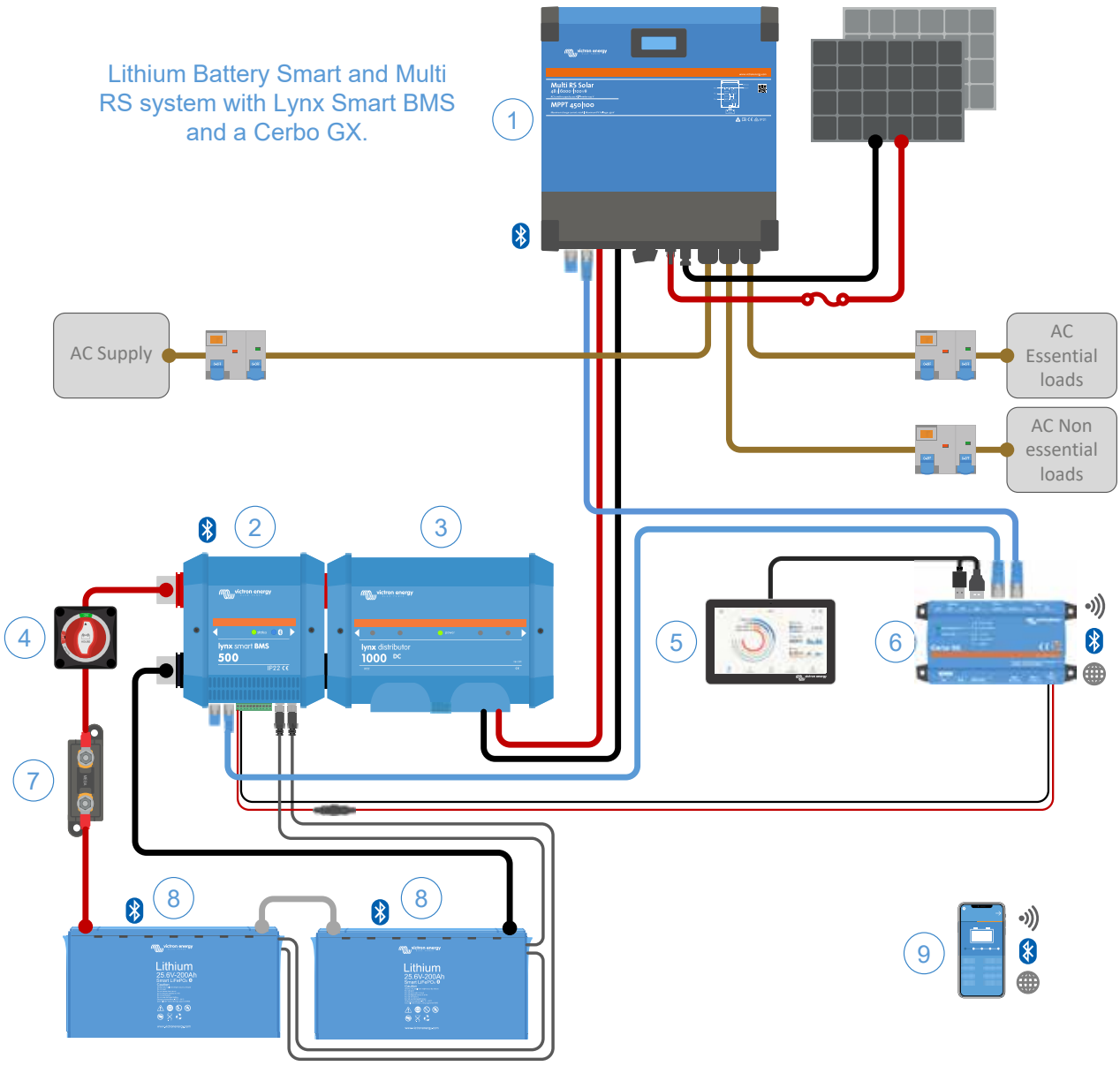

| ID | ITEMS AND NOTES | | |
|---|---|---|---|
| 1 | Digital Multi Control 200/200A GX, to remotely view and control the inverter/charger. | | |
| 2 | The VE.Bus BMS V2 directly controls the inverter/charger(s) via VE.Bus in a 12, 24 or 48V Lithium Battery Smart system. | | |
| 3 | MultiPlus(-II) or Quattro(-II) inverter/charger(s) for 12, 24 or 48V systems, models ranging from 500VA up to 15kVA. | | |
| 4 | BatteryProtect, available in 65, 100 or 220A models, for 12, 24 or 48V, with or without Bluetooth. | | |
| 5 | SmartShunt battery monitor, available in 500, 100 or 2000A model. | | |
| 6 | Lithium Battery Smart, 12.8V or 25.6V batteries connected in series and/or parallel creating a 12V, 24V or 48V battery bank. | | |
| 7 | VE.Direct non inverting remote on/off cable, to enable BMS control via the solar charger VE.Direct port. | | |
| 8 | **Solar charger**, available up to 100A, for 12, 24 or 48V, with or without Bluetooth. | | |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). | | |
| | Lithium Battery Smart BMS communication cable attached to the battery. Extension cables are available. | | |
| | Do not discharge (orange) signal wire. Do not charge (yellow) signal wire. | | |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. | | |
| | Remote on/off signal wire. | | Optional on/off switch. |
| | VE.Direct cable, available in lengths ranging from 30cm to 10m. | | DC fuse. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. | | Small DC fuse, included with the product. |
| | Phone with the VictronConnect app communicating via Bluetooth. | | Solar panel or solar array. |




| ID | ITEMS AND NOTES | | |
|---|---|---|---|
| 1 | MultiPlus(-II) or Quattro(-II) inverter/charger for 12, 24 or 48V systems, models ranging from 500VA up to 15kVA. | | |
| 2 | Cerbo GX for local and remote system monitoring and configuration. | | |
| 3 | GX Touch display gives an instant overview of your system. | | |
| 4 | Lynx Distributor, a modular busbar system with integrated DC fuses and fuse monitoring. | | |
| 5 | Lynx Smart BMS, battery management system for Victron Lithium batteries, with integrated battery monitor and DC contactor. | | |
| 6 | BatteryProtect, available in 65, 100 or 220A models, for 12, 24 or 48V, with or without Bluetooth. | | |
| 7 | Lithium Battery Smart, 12.8V or 25.6V batteries connected in series and/or parallel creating a 12V, 24V or 48V battery bank. | | |
| 8 | **Solar charger**, available up to 100A, for 12, 24 or 48V, with or without Bluetooth. | | |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). | | |
| | Lithium Battery Smart BMS communication cable attached to the battery. Extension cables are available. | | |
| | Do not discharge (orange) signal wire. Do not charge (yellow) signal wire. | | |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. | | |
| | Remote on/off signal wire. | | Optional on/off switch. |
| | VE.Direct cable, available in lengths ranging from 30cm to 10m. | | DC fuse. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. | | RJ45 terminator. |
| | Phone with the VictronConnect app communicating via Bluetooth. | | Solar panel or solar array. |

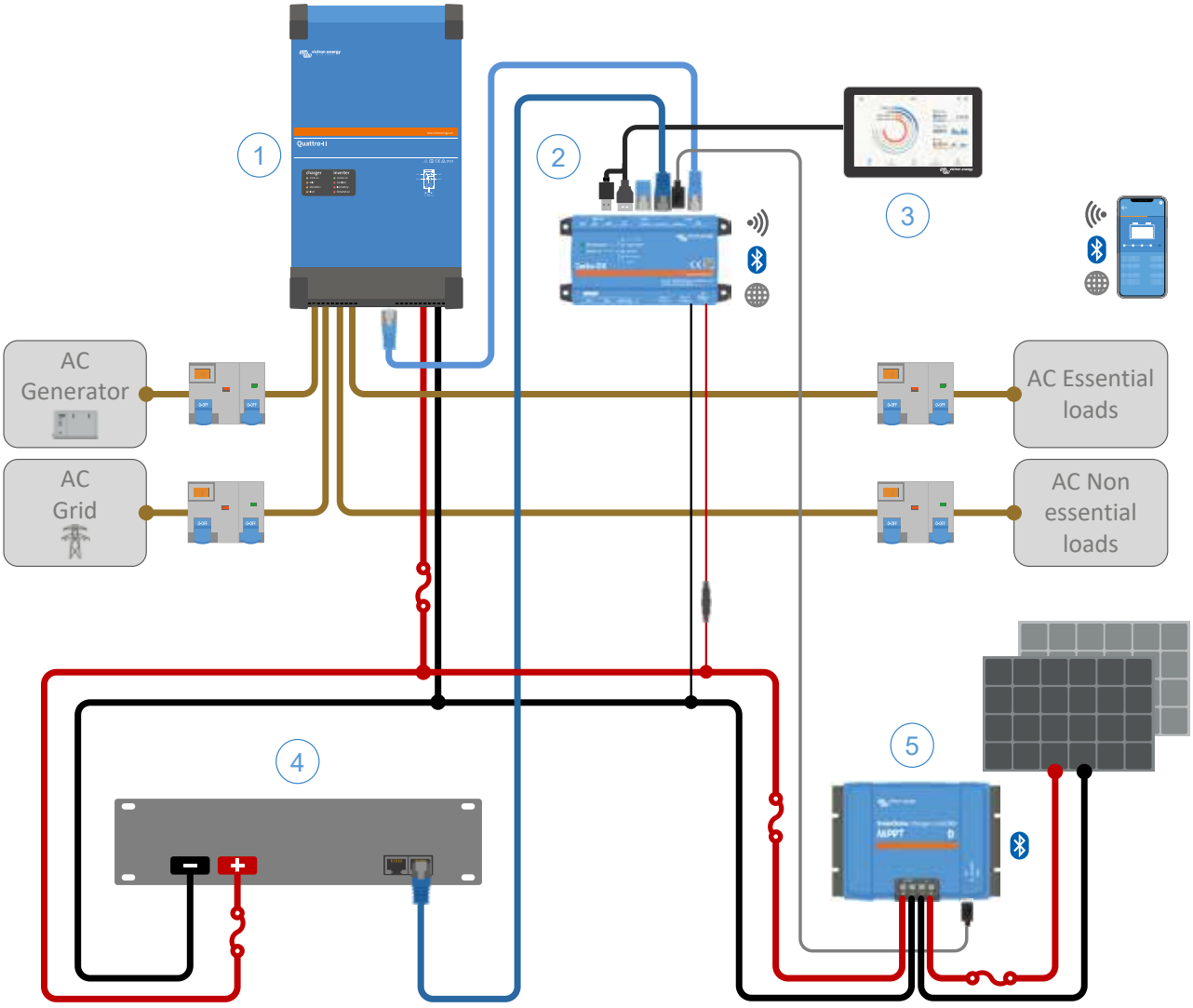



| ID | ITEMS AND NOTES |
|---|---|
| 1 | Quattro or MultiPlus inverter/chargers, 3 units, configured in 3-phase, creating an uninterruptable power supply. |
| 2 | GX Touch, touch screen to display system information, available in a 5 or 7 inch model. |
| 3 | Lynx Distributor, a modular busbar system with integrated DC fuses and fuse monitoring. |
| 4 | Lynx Smart BMS, battery management system for Victron Lithium batteries, with integrated battery monitor and DC contactor. |
| 5 | SmartSolar MPPT solar charge controller, available in models ranging up to 100A, multiple units can be paralleled. |
| 6 | Cerbo GX, for system monitoring, control, and remote access. Communicates with the VRM portal and VictronConnect app. |
| 7 | GX LTE 4G, a 4G modem and GPS accessory for the Cerbo GX. |
| 8 | Lithium Battery Smart 26.5V 200Ah, 3 paralleled pairs, creating a 600Ah, 48V battery bank. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |
| | Lithium Battery Smart BMS communication cable attached to the battery. Extension cables are available. |
| | 3-phase AC wiring, AC circuit breakers (CB or MCB) and AC earth fault detector (RCD, RCB or GFCI). |
| | AC Generator, 3-phase. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. |
| | VE.Direct cable, available in lengths ranging from 30cm to 10m. |
| | RJ45 terminator. |
| | 3-phase AC loads. |
| | AC transfer switch. |
| | Solar panel or solar array. |

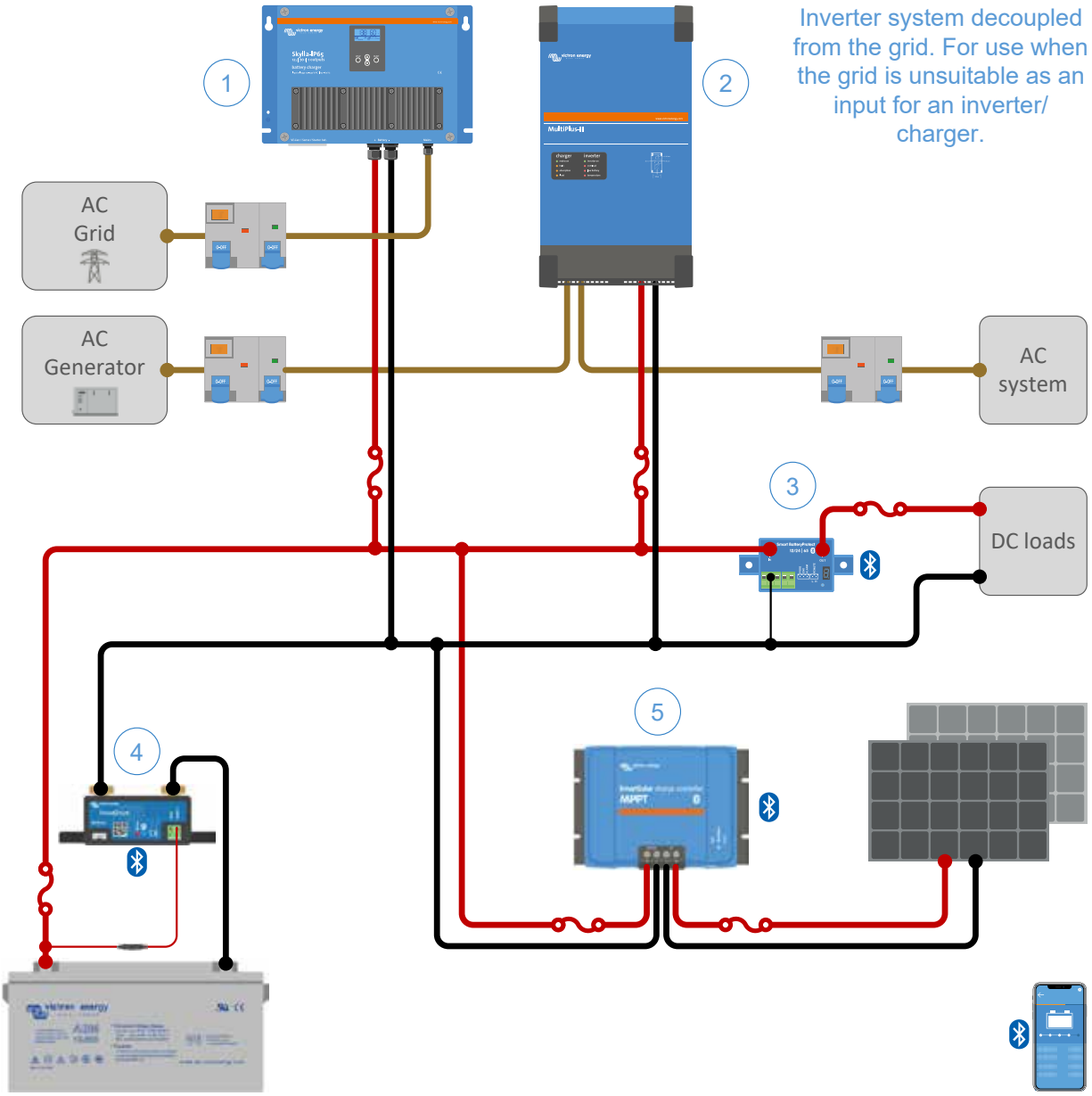



| ID | ITEMS AND NOTES | | |
|---|---|---|---|
| 1 | Multi RS Solar, 48Vdc, 6000VA, 230Vac inverter/charger with a 450Vdc 4kWp PV input. | | |
| 2 | Lynx Smart BMS, battery management system for Victron Lithium batteries, with integrated battery monitor and DC contactor. | | |
| 3 | Lynx Distributor, a modular busbar system with integrated DC fuses and fuse monitoring. | | |
| 4 | Battery Switch, rated 275A, suitable for 12, 24 or 48V systems. | | |
| 5 | GX Touch display gives an instant overview of your system. | | |
| 6 | Cerbo GX for local and remote system monitoring and configuration. | | |
| 7 | Fuse holder with fuse. | | |
| 8 | Lithium Battery Smart, 25.6V batteries connected in series and/or series/parallel creating a 48V battery bank. | | |
| 9 | Phone with the VictronConnect app communicating via Bluetooth and the VRM app communicating via the internet. | | |
| | Solar panel or solar array. | | |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). | | |
| | Lithium Battery Smart BMS communication cable attached to the battery. Extension cables are available. | | |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. | | |
| | DC fuse. | | Small DC fuse, included with the product. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. | | RJ45 terminator. |

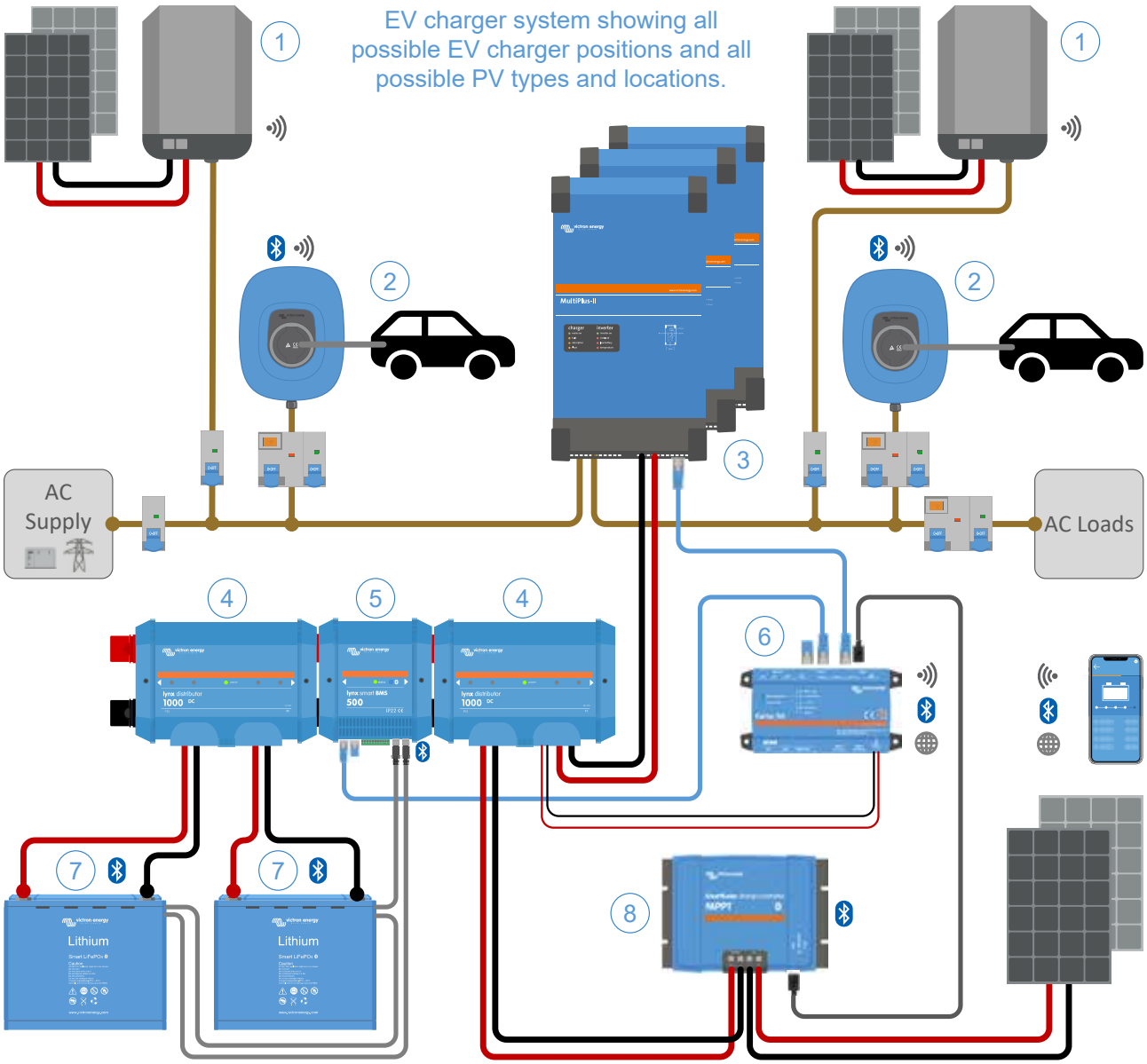
System with inverter/charger and a self managed battery and a Cerbo GX.




| ID | ITEMS AND NOTES |
|---|---|
| 1 | MultiPlus(-II) or Quattro(-II) inverter/charger for 12, 24 or 48V systems, models ranging from 500VA up to 15kVA. |
| 2 | Cerbo GX for local and remote system monitoring and configuration. |
| 3 | GX Touch display gives an instant overview of your system. |
| 4 | Single or multiple self managed battery 12, 24, 48V. |
| 5 | **Solar charger**, available up to 100A, for 12, 24 or 48V, with or without Bluetooth. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | VE.Can to CAN-bus BMS cable for communication between managed battery and GX device, available in type A or B. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. |
| | VE.Can RJ45 terminator. |
| | Solar panel or solar array. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Small DC fuse, included with the product. |
| | DC fuse. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |




| ID | ITEMS AND NOTES |
|---|---|
| 1 | 12, 24 or 48V Battery charger. |
| 2 | MultiPlus(-II) or Quattro(-II) inverter/charger for 12, 24 or 48V systems, models ranging from 500VA up to 15kVA. |
| 3 | BatteryProtect, available in 65, 100 or 220A models, for 12, 24 or 48V, with or without Bluetooth. |
| 4 | SmartShunt battery monitor, available in 500, 100 or 2000A model. |
| 5 | Solar charger, available up to 100A, for 12, 24 or 48V, with or without Bluetooth. |
| | Phone with the VictronConnect app communicating via Bluetooth. |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). |
| | Solar panel or solar array. |
| | 12, 24 or 48V battery or battery bank consisting of multiple batteries in series, parallel or series/parallel. |
| | Small DC fuse, included with the product. |
| | DC fuse. |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. |




| ID | ITEMS AND NOTES | | |
|---|---|---|---|
| ① | PV inverter, connected to the grid or generator side (input) or the “always on” (output) side of the inverter/charger. | | |
| ② | EV Charging Station NS, connected to the grid or generator (input) side or the “always on” (ouput) side of the inverter/charger. | | |
| ③ | Quattro or MultiPlus inverter/charger(s), configured in 1-phase or 3-phase, creating an uninterruptable power supply. | | |
| ④ | Lynx Distributor, a modular busbar system with integrated DC fuses and fuse monitoring. | | |
| ⑤ | Lynx Smart BMS, battery management system for Victron Lithium batteries, with integrated battery monitor and DC contactor. | | |
| ⑥ | Cerbo GX, for system monitoring, control, and remote access. Communicates with the VRM portal and VictronConnect app. | | |
| ⑦ | Lithium Battery Smart, 12.8V or 25.6V batteries connected in series and/or parallel creating a 12V, 24V or 48V battery bank. | | |
| ⑧ | SmartSolar MPPT solar charge controller, available in models ranging up to 100A, multiple units can be paralleled. | | |
| | Positive (red) and negative (black) DC cables. For the correct cable sizing see the Wiring Unlimited book. | | |
| | Lithium Battery Smart BMS communication cable is attached to the battery. Extension cables are available. | | |
| | AC wiring, AC circuit breaker (CB or MCB) and AC earth fault detector (RCD, RCB or GFC). | | |
| | AC Supply (grid or generator) | | AC loads. |
| | Phone with the VictronConnect app communicating via Bluetooth. | | Electric vehicle. |
| | VE.Direct cable is available in lengths ranging from 30cm to 10m. | | Solar panel or solar array. |
| | RJ45 UTP cable, available in lengths ranging from 30cm to 30m. | | RJ45 terminator. |

OFF-GRID, BACKUP & STORAGE SYSTEMS

# Why Victron?

At Victron Energy we're as dedicated and driven to making and improving power solutions today as we were when we started in 1975. Thanks to our customer feedback loop, data and knowledge sharing, we innovate 24/7. We are powered by know-how, it keeps us going and our users going, ensuring peace of mind in off-grid for years to come.

01



### It's not one thing that makes it all work.

Our modular, robust and connected off-grid systems have been proven to deliver unequalled reliability time and time again, even in the harshest of climates. But it's our unique combination of up-to-date hard- and software, intelligent monitoring apps, the network of highly trained authorized professionals and widespread repair centers that turns a Victron Energy system into an unbeatable system, that is Powered by know-how.

02



### Reliability powers long service life cycles.

When making power supply investment decisions, calculations purely based on price can be deceptive. Their true performance and expected service life cycle are equally important. Good thing Victron Energy equipment lives up to their specifications, both in terms of performance and expected life cycle (when used as designed). Our 5 or 10 year warranty and fair and fast repair policies mean your investments are protected and under most circumstances, won't let you down.

Endless energy
since 1975

03



## How efficiency translates into great cost-effectiveness.

With battery-based systems, efficiency is always key to providing great levels of cost-effectiveness. From our incredibly efficient SmartSolar Charge Controllers to the way our inverter/chargers can provide a super-efficient Energy Storage or off-grid system, with a Blue Power system you can be sure that all the details are thought through. This, combined with our reputation for extreme resilience and expected life cycles, translates into cost-effective solutions, especially when compared to 'cheaper' options.

04



## Intelligent monitoring means optimized systems.

Monitoring is crucial to fine tune and optimize energy harvest and use based on ever changing circumstances. With Victron you can experience the power of know-how right from your hand. Through our industry leading and free VictronConnect app, you always have perfect control over your system from wherever you are. With our app and VRM portal you can monitor the complete system, change settings and catch potential issues early by programming alerts and alarms.

05



## Our worldwide network of Authorized dealers is by your side.

Our global network of ±1000 highly trained distributors, installers and service partners are always on hand to help. From stock advice, installation recommendations, after-care and technical support.

With the Victron Energy team, their partners and lively community you can always be sure the power of know-how is by your side.

OFF-GRID, BACKUP & STORAGE SYSTEMS

# System schematic drawing & requirements

Always feel free to contact your local Victron dealer, they are happy to help and trained with the highest of know-how to translate your needs into a robust system. Find your local dealer at **'Where to buy'** on our website.



OFF-GRID, BACKUP & STORAGE SYSTEMS

# Flexible building blocks to solve any kind of power challenge

With Victron Energy you have one of the widest ranges of robust connected power products that keep performing, even in the harshest of climates. Our up-to-date solutions counter most off-grid issues and can be fine-tuned to the most demanding and specific needs.



Feel free to ask your local Victron dealer for advice.

**www.victronenergy.com**








Inverter/chargers — Inverter/charger/MPPT — Inverters









Solar chargers from small — ...to large









Battery chargers — EV charging station — DC distribution systems





Battery Monitoring — System monitoring

***And more***

Battery protection - DC-DC converters and chargers - Lithium batteries - AGM and GEL batteries - Battery Management Systems - Voltage sensitive relays - Fuses and fuse holders - Busbars - Battery switches


With the power of know-how
by your side, you get
**Energy. Anytime. Anywhere.**

**Victron Energy B.V.**

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www.victronenergy.com

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