



more energy
more freedom
more security
more control

Telecom Hybrid Power Solutions

The advantages of having a system designed by Victron Energy:

Less Operating Expenses

- 50% of your current generator maintenance costs
- 50% or less of your current fuel consumption costs
- Less costs for replacing equipment

Less Capital Expenses

- The operating life of your generator is doubled
- A significant increase in the operating life of your batteries

Remote Monitoring

- Unique integration with Network Operation Centers
- A significant decrease in amount of truck rolls required
- SNMP compatible

A Greener Environment

- Silent running time
- Less CO₂ emissions
- The possibility to add solar and wind power

Increased Reliability

- System downtime is minimized



Power at all times

Sites connected to an unreliable grid, as well as off-grid sites, have one thing in common. They are in desperate need of a reliable power supply. Victron Energy is able to guarantee a steady and dependable supply of power, wherever and whenever. Victron's ability to efficiently combine two or more power sources doesn't just ensure a continuous supply of power. It also extends the life of critical operating equipment. The result: less costs, more reliability, and a greener environment.

Remote Monitoring and Control Wherever and Whenever

Victron Energy offers two different means to facilitate a nonstop safeguard for your entire Network Operation Center (NOC):

Integration with existing NOC systems

Victron has developed a unique method to integrate with existing NOC systems. Your NOC will be directly connected to your modem; via SNMP. This connection can be established through GPRS as well as through Ethernet (TCP/IP).

Victron Remote Management (VRM)

VRM enables you to monitor your power supply system on the (secure) VRM website. It logs data from battery monitors, Multi's, Quattro's and Inverters through a GPRS or TCP/IP connection. This information is then stored, analyzed and archived on the VRM website, which is free of charge.

Another feature is the ability to receive alarms, warnings and system status reports on your cellular phone via text messages (SMS).

Features:

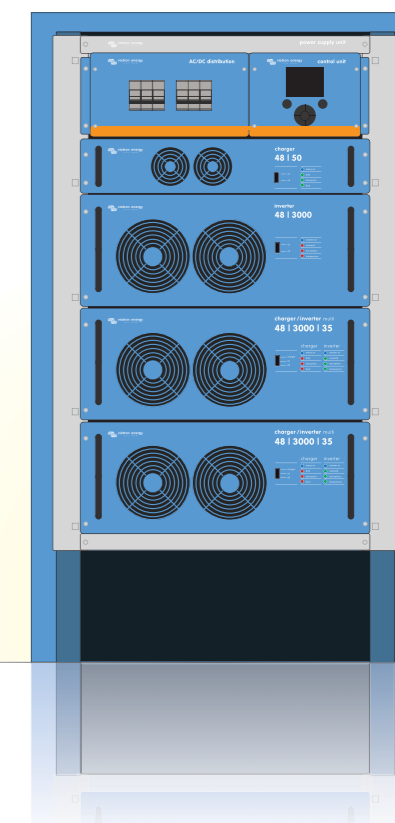
- Connects either to a GPRS mobile network or to Ethernet (TCP/IP)
- Sends data to a user-accessible website. In addition to system status information and alarms, the website provides graphical display of voltage, current and other important parameters
- Sends SMS (text) messages to a cellular phone, containing system status information and alarms

Wall-mounted & 19"

Victron Energy is specialized in designing both wall-mounted and 19" systems. Victron has recently developed a dedicated subrack which fits in a standard 19" cabinet. The subrack contains a connection- and control box. It also has space for equipment such as inverters, chargers and Multi's.

Subrack benefits:

- Integrated monitoring and control
- Integrated AC & DC distribution
- Hot-swappable (replacing equipment has never been easier)



Precision Battery Monitoring



BMV 600



BMV bezel square



BMV shunt



BMV 602S Black



VE.Net Battery Controller

Precision monitoring

The essential function of a battery monitor is to calculate ampere-hours consumed and the state of charge of a battery. Ampere-hours consumed is calculated by integrating the current flowing in or out of the battery. In case of a constant current, this integration is equivalent to current multiplied by time. A discharge current of 10A during 2 hours, for example, amounts to 20Ah consumed. All our battery monitors are based on a powerful microprocessor, programmed with the algorithms needed for precision monitoring.

Standard information and alarms

- Battery voltage (V).
- Battery charge/discharge current (A).
- Ampere-hours consumed (Ah).
- State of charge (%).
- Time to go at the current rate of discharge.
- Visual and audible alarm: over- and under voltage, and/or battery discharged.
- Programmable alarm or generator start relay.

BMV 600S: low cost ultra high resolution monitor

- Highest resolution: 10mA (0,01A) with 500A shunt.
- Can be used with 50, 60 or 100mV shunts, current rating from 100A to 1000A
- Lowest current consumption: 4mA @12V and 3mA @ 24V.
- Easiest to wire: the BMV 600S comes with shunt, 10 meter RJ 12 UTP cable and 2 meter battery cable with fuse; no other components needed.
- Easiest to install: separate front bezel for square or round appearance; ring for rear mounting and screws for front mounting.
- Broadest voltage range: 9 – 90 VDC without prescaler needed.
- Communication port (Isolated RS232 interface is needed to connect to a computer)

BMV 602S: two batteries

In addition to all the features of the BMV600S, the BMV602S can measure the voltage of a second battery. A version with a black front bezel (BMV 602S Black) is also available.

BMV 602HS: 70 to 350VDC voltage range

No prescaler needed. Note: suitable for systems with grounded minus only (battery monitor is not isolated from shunt).

Optional Isolated RS232 communication interface and software

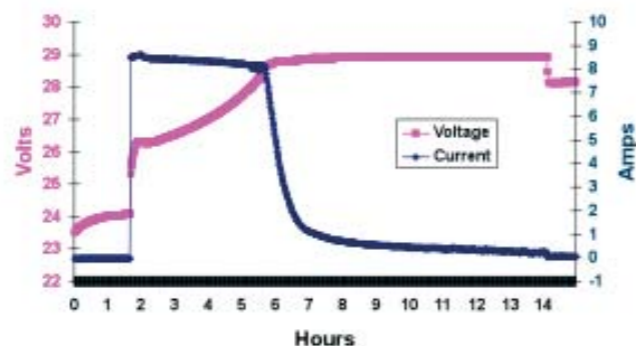
(for all BMV models) Displays all information on a computer and loads charge/discharge data in an Excel file for graphical display.

VE.Net Battery Controller: any number of batteries

- One VE.Net panel or Blue Power panel will connect to any number of battery controllers.
- Comes with 500A/50mV shunt and can be programmed for 50, 60 or 100mV shunts, current rating from 100A to 10.000A.
- With use, abuse and data memory.
- Temperature sensor and connection kit included.

High voltage VE.Net Battery Controller: 70 to 350VDC

No prescaler needed. Note: RJ45 connectors are galvanically isolated from Controller and shunt.



Example of a battery charge curve recorded with a BMV 602 and VEBat software

Battery monitor	BMV 600S	BMV 602S & BMV 602S BLACK	BMV 602HS	VE. Net Battery Controller	VE. Net High Voltage Battery Controller
Power supply voltage range	9 - 90 VDC	9 - 90 VDC	70 – 350 VDC	7 - 75 VDC	70 - 350 VDC ¹
Current draw, back light off	< 4 mA	< 4 mA	< 4 mA	< 5 mA	< 4 mA
Input voltage range (VDC)	9 - 90 VDC	9 - 90 VDC	70 – 350 VDC	0 - 75 VDC	0 – 350 VDC
Battery capacity (Ah)	20 – 9.999 Ah		20 - 60.000 Ah		
Operating temperature range	-20 +50°C (0 - 120°F)				
Measures voltage of second battery	No	Yes	Yes	Yes	
Communication port	Yes	Yes	Yes	Yes (VE.Net)	
Potential free contacts	60V/1A (N/O)				
RESOLUTION (with a 500 A shunt)					
Current	± 0,01 A		± 0,1 A		
Voltage			± 0,01 V		
Amp hours			± 0,1 Ah		
State of charge (0 – 100 %)			± 0,1 %		
Time to go			± 1 min		
Temperature (0 - 50°C or 30 - 120°F)	n. a.		± 1°C (± 1°F)		
Accuracy of current measurement			± 0,3 %		
Accuracy of voltage measurement			± 0,4 %		
INSTALLATION & DIMENSIONS					
Installation	Flush mount		DIN rail		
Front	63 mm diameter		22 X 75 mm (0.9 x 2.9 inch)		
Front bezel	69 x 69 mm (2.7 x 2.7 inch)		n. a.		
Body diameter	52mm (2.0 inch)		n. a.		
Body depth	31 mm (1.2 inch)		105 mm (4,1 inch)		
ACCESSORIES					
Shunt (included)	500 A / 50 mV ²		500 A / 50 mV ³		
Cables (included)	10 meter 6 core UTP with RJ12 connectors, and cable with fuse for '+' connection		Supplied with 1 m cables		
Temperature sensor	n. a.		Supplied with 3 m cable		
Computer interface	optional	optional	Computer interface	optional	
1) 7 – 75 VDC needed for VE.Net network power supply 2) HV version with shunt in plastic enclosure 3) HV version with shunt + Controller in plastic enclosure					



Victron Global Remote

The Global Remote is a modem which sends alarms, warnings and system status reports to cellular phones via text messages (SMS). It can also log data from Victron Battery Monitors, MultiPlus units, Quattro's and Inverters to a website through a GPRS connection. Access to this website is free of charge.



Victron Global Remote to BMV 602 Connection Kit

Cable kit required to connect the BMV 602 and the Victron Global Remote. BMV 602 Data Link included.



Blue Power panel

The VE.Net Blue Power Panel is the panel that connects to the VE.Net Battery Controller. The panel can show the information of multiple batteries on one display for simple and efficient monitoring of your battery systems. For our other VE.Net products please refer to our VE.Net datasheet.

Victron Global Remote

Obtaining system information wherever and whenever



A GSM/GPRS modem

The Global Remote is a modem which sends alarms, warnings and system status reports to cellular phones via text messages (SMS). It can also log data from Victron Battery Monitors, Multi's, Quattro's and Inverters to a website through a GPRS connection. The usage of this website is free of charge.

Simple and easy to use

The idea is simple: you can use it to get SMS alarms from a Multi, a Battery System, or both. When monitoring the usage of batteries, it can be extremely helpful to receive under and overvoltage alarms; whenever they occur. For this purpose, the Global Remote is perfect. A prepaid SIM-card (for example) in combination with the Global Remote is adequate for remotely monitoring your system.

Two serial connections

It has one connection for a VE.Bus Multi/Quattro/Inverter unit/system. This connection needs a MK2 which is supplied with the VGR. The other connection is to connect a BMV-602 Battery Monitor. To connect it to a BMV-602 you will also need the BMV-602 Datalink. The BMV-602 Datalink is an accessory of the BMV-602 which needs to be purchased separately.

Advanced usage: Monitoring historic data

Taking it one step further, an internet browser and -connection is all you need to view all of the data online. You can simply create an account on the website and add your modem(s). Subsequently you can configure the GPRS connection, which will enable you to monitor the historic data of several basic properties such as system voltages, power levels and status information. All of this data is graphed. These graphs are available in daily, weekly and monthly timeframes.

Victron Remote Management

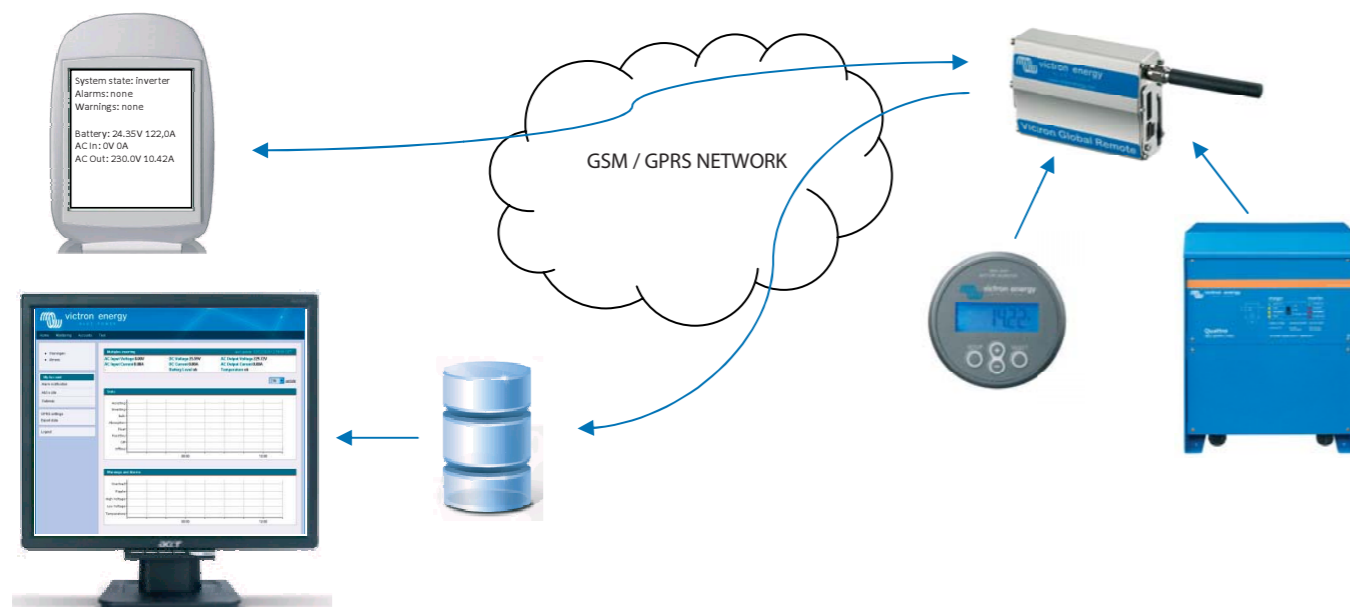
Victron Remote Management is the name of the system which consists of the VGR and the monitoring website. To get a preview: please go to <https://vrm.victronenergy.com>, and login with below details.

Username: demo@victronenergy.com

Password: vrmdemo



System configuration example



Victron Global Remote	
Serial connection (Mk2.2a – included)	Connect VE.Bus Multi/Quattro/Inverter unit/system
Serial connection (BMV-602 Datalink – not included)	Connect BMV-602 Battery Monitor
GENERAL	
Power supply voltage range	5.5 to 32VDC
Current draw (max.)	0.48A at 5.5VDC
Operating temperature range	-30° to 75° C. / -22° to 167° F.
ENCLOSURE	
Dimensions VGR Modem (h x w x d)	73 x 54.5 x 25.5 mm / 2.9 x 2.1 x 1 inch
Weight VGR Modem	89 grams / 3.1 ounces
Body	Aluminum
Installation	Two aluminum mounting bridles
GSM /GPRS	
GPRS data usage	To be defined
ACCESSORIES (ALL INCLUDED)	
GSM antenna	n.a.
Battery cable	With inline fuse
Y-cable	16-way plug to male DB9 + 12-way socket
Male DB15 to female DB9 cable	Including gender changer and null modem add-on
MK2 interface	n.a.



BMV-602

The BMV-602 is our newest high precision battery monitor. The essential function of a battery monitor is to calculate ampere-hours consumed as well as the state of charge of a battery. Ampere-hours consumed are calculated by integrating the current flowing in or out of the battery.

Victron Global Remote to BMV-602 Connection Kit

Cable kit required to connect the BMV-602 and the Victron Global Remote. BMV 602 Data Link included.

MultiPlus Inverter/Charger

The MultiPlus is a powerful true sine wave inverter, a sophisticated battery charger that features adaptive charge technology, and a high-speed AC transfer switch in a single compact enclosure.

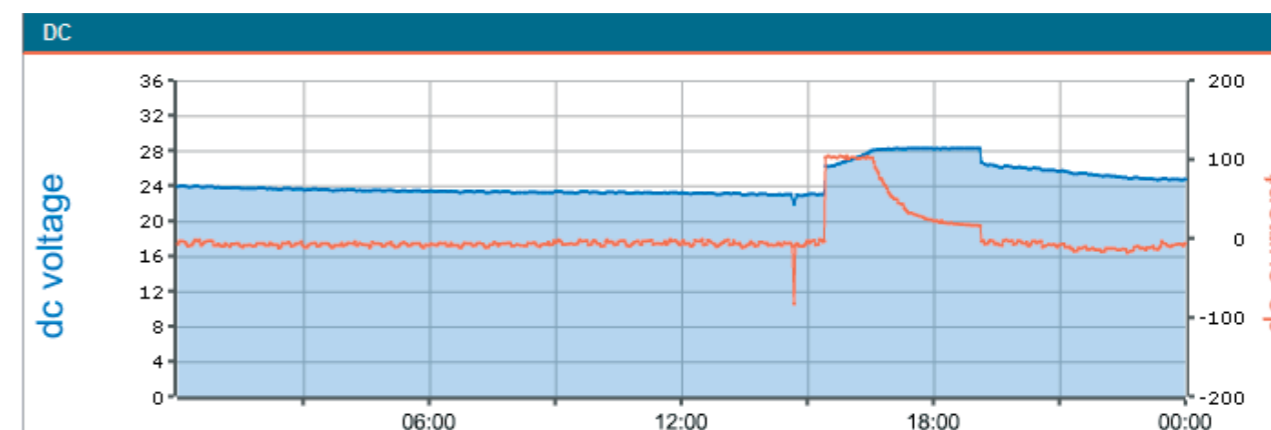
Phoenix Inverter

Pure sinewave output, high peak power and high efficiency. Combined high frequency and line frequency technologies ensure the best of both worlds.

Quattro Inverter/Charger

The Quattro can be connected to two independent AC sources, for example shore-side power and a generator, or two generators. The Quattro will automatically connect to the active source.

Example of graph available on <https://vrm.victronenergy.com>



Skylla TG Charger 24/48V



Skylla TG 24 50



Skylla TG 24 50 3 phase



Skylla TG 24 100

Perfect chargers for any type of battery

Charge voltage can be precisely adjusted to suit any sealed or unsealed battery system. In particular, sealed maintenance free batteries must be charged correctly in order to ensure a long service life. Overvoltage will result in excessive gassing and venting of a sealed battery. The battery will dry out and fail.

Suitable for AC and DC supply (AC-DC and DC-DC operation)

Except for the 3 phase input models, the chargers also accept a DC supply.

Controlled charging

Every TG charger has a microprocessor, which accurately controls the charging in three steps. The charging process takes place in accordance with the IUoUo characteristic and charges more rapidly than other processes.

Use of TG chargers as a power supply

As a result of the perfectly stabilized output voltage, a TG charger can be used as a power supply if batteries or large buffer capacitors are not available.

Two outputs to charge 2 battery banks

The TG chargers feature 2 isolated outputs. The second output, limited to approximately 4 A and with a slightly lower output voltage, is intended to top up a starter battery.

To increase battery life: temperature compensation

Every Skylla TG charger comes with a battery temperature sensor. When connected, charge voltage will automatically decrease with increasing battery temperature. This feature is especially recommended for sealed batteries which otherwise might be overcharged and dry out due to venting.

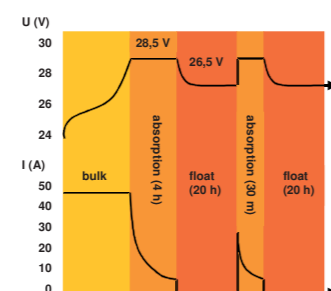
Battery voltage sense

In order to compensate for voltage loss due to cable resistance, TG chargers are provided with a voltage sense facility so that the battery always receives the correct charge voltage.

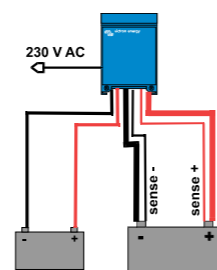
Learn more about batteries and battery charging

To learn more about batteries and charging batteries, please refer to our book 'Energy Unlimited' (available free of charge from Victron Energy and downloadable from www.victronenergy.com).

Charge curve



Application example



Skylla	24/30 TG 24/50 TG	24/50 TG 3 phase	24/80 TG	24/100 TG	24/100.TG 3 phase	48/25 TG	48/50 TG
Input voltage (V AC)	230	3 x 400	230	230	3 x 400	230	230
Input voltage range (V AC)	185-264	320-450	185-264	185-264	320-450	185-264	185-264
Input voltage range (V DC)	180-400	n. a.	180-400	180-400	n. a.	180-400	180-400
Frequency (Hz)	45-65						
Power factor	1						
Charge voltage 'absorption' (V DC)	28,5	28,5	28,5	28,5	28,5	57	57
Charge voltage 'float' (V DC)	26,5	26,5	26,5	26,5	26,5	53	53
Charge current house batt. (A) (2)	30 / 50	50	80	100	100	25	50
Charge current starter batt. (A)	4	4	4	4	4	n. a.	n. a.
Charge characteristic							
Battery capacity (Ah)	150-500	250-500	400-800	500-1000	500-1000	125-250	250-500
Temperature sensor	√						
Can be used as power supply	√						
Remote alarm	Potential free contacts 60V / 1A (1x NO and 1x NC)						
Forced cooling	√						
Protection (1)	a,b,c,d						
Operating temp. range	-20 to 60°C (0 - 140°F)						
Humidity (non condensing)	max 95%						
ENCLOSURE							
Material & Colour	aluminium (blue RAL 5012)						
Battery-connection	M8 studs						
230 V AC-connection	screw-clamp 2,5 mm ² (AWG 6)						
Protection category	IP 21						
Weight kg (lbs)	5,5 (12.1)	13 (28)	10 (22)	10 (22)	23 (48)	5,5 (12.1)	10 (12.1)
Dimensions hxxwxd in mm (hxxwxd in inches)	365x250x147 (14.4x9.9x5.8)	365x250x257 (14.4x9.9x10.1)	365x250x257 (14.4x9.9x10.1)	365x250x257 (14.4x9.9x10.1)	515x260x265 (20x10.2x10.4)	365x250x147 (14.4x9.9x5.8)	365x250x257 (14.4x9.9x10.1)
OPTIONS							
Charger output panel	√						
Charger switch panel	√						
Battery alarm panel	√						
STANDARDS							
Safety	EN 60335-1, EN 60335-2-29						
Emission	EN 55014-1, EN 61000-3-2						
Immunity	EN 55014-2, EN 61000-3-3						
	1) Protection a. Output short circuit b. Battery reverse polarity detection 2) Up to 40°C (100°F) ambient		c. Battery voltage too high d. Temperature too high				



BMV 600 Battery Monitor

The BMV - 600 Battery Monitor features an advanced microprocessor control system combined with high resolution measuring systems for battery voltage and charge/discharge current. Besides this, the software includes complex calculation algorithms, like Peukert's formula, to exactly determine the state of charge of the battery. The BMV - 600 selectively displays battery voltage, current, consumed Ah or time to go.



Charger Output

Reduces the maximum output current of the charger. This panel can also be useful if the shore power fuse is limited: the AC current drawn by the battery charger can be controlled by limiting the maximum output current, thereby preventing the shore power fuse from blowing.



Charger Switch

A remote on-off switch



Battery Alarm

An excessively high or low battery voltage is indicated by an audible and visual alarm.

Quattro inverter / charger

3kVA - 5kVA



Quattro
48/5000/70



Quattro
24/3000/70

Two AC inputs with integrated transfer switch

The Quattro can be connected to two independent AC sources, for example shore-side power and a generator, or two generators. The Quattro will automatically connect to the active source.

Two AC Outputs

The main output has no-break functionality. The Quattro takes over the supply to the connected loads in the event of a grid failure or when shore/generator power is disconnected. This happens so fast (less than 20 milliseconds) that computers and other electronic equipment will continue to operate without disruption.

The second output is live only when AC is available on one of the inputs of the Quattro. Loads that should not discharge the battery, like a water heater for example, can be connected to this output.

Virtually unlimited power thanks to parallel operation

Up to 6 Quattro units can operate in parallel. Six units 24/5000/120, for example, will provide 25kW / 30kVA output power and 720 Amps charging capacity.

Three phase capability

Three units can be configured for three-phase output. But that's not all: up to 6 sets of three units can be parallel connected to provide 75kW / 90kVA inverter power and more than 2000A charging capacity.

PowerControl – Dealing with limited generator, shore-side or grid power

The Quattro is a very powerful battery charger. It will therefore draw a lot of current from the generator or shore side supply (16A per Quattro at 230VAC). A current limit can be set on each AC input. The Quattro will then take account of other AC loads and use whatever is spare for charging, thus preventing the generator or shore supply from being overloaded.

PowerAssist – Boosting shore or generator power

This feature takes the principle of PowerControl to a further dimension allowing the Quattro to supplement the capacity of the alternative source. Where peak power is so often required only for a limited period, the Quattro will make sure that insufficient shore or generator power is immediately compensated for by power from the battery. When the load reduces, the spare power is used to recharge the battery.

Solar energy: AC power available even during a grid failure

The Quattro can be used in off grid as well as grid connected PV and other alternative energy systems.

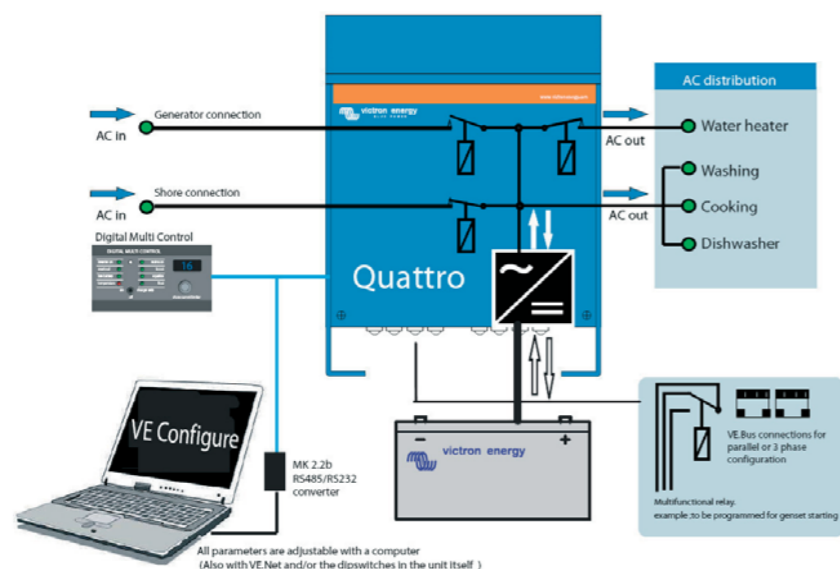
System configuring has never been easier

After installation, the Quattro is ready to go.

If settings have to be changed, this can be done in a matter of minutes with a new DIP switch setting procedure. Even parallel and 3-phase operation can be programmed with DIP switches: no computer needed!

Alternatively, VE.Net can be used instead of the DIP switches.

And sophisticated software (VE.Bus Quick Configure and VE.Bus System Configurator) is available to configure several new, advanced, features.



Quattro	12/3000/120	24/3000/70	24/5000/120	48/5000/70
PowerControl / PowerAssist	Yes			
Integrated Transfer switch	Yes			
AC inputs (2x)	Input voltage range: 187-265 VAC Input frequency: 45 – 65 Hz Power factor: 1			
Maximum feed through current (A)	50 / 30	50 / 30	2 x 30	50 / 30
INVERTER				
Input voltage range (V DC)	9,5 – 17	19 – 33	19 – 33	38 – 66
Output (1)	Output voltage: 230 VAC ± 2% Frequency: 50 Hz ± 0,1%			
Cont. output power at 25 °C (VA) (3)	3000	3000	5000	5000
Cont. output power at 25 °C (W)	2500	2500	4250	4250
Cont. output power at 40 °C (W)	2000	2000	3350	3350
Peak power (W)	6000	6000	10.000	10.000
Maximum efficiency (%)	93	94	94	95
Zero-load power (W)	15	15	25	25
Zero load power in AES mode (W)	10	10	20	20
Zero load power in Search mode (W)	4	5	5	6
CHARGER				
Charge voltage 'absorption' (V DC)	14,4	28,8	28,8	57,6
Charge voltage 'float' (V DC)	13,8	27,6	27,6	55,2
Storage mode (V DC)	13,2	26,4	26,4	52,8
Charge current house battery (A) (4)	120	70	120	70
Charge current starter battery (A)	4 (12V and 24V models only)			
Battery temperature sensor	Yes			
GENERAL				
Auxiliary output (A) (5)	25	25	16	25
Programmable relay (6)	Yes			
Protection (2)	a-g			
VE.Bus communication port	For parallel and three phase operation, remote monitoring and system integration			
Common Characteristics	Operating temp.: -20 to +50 °C Humidity (non condensing): max. 95%			
ENCLOSURE				
Common Characteristics	Material & Colour: aluminium (blue RAL 5012) Protection category: IP 21			
Battery-connection	Four M8 bolts (2 plus and 2 minus connections)			
230 V AC-connection	Screw terminals 13 mm ² (6 AWG)			
Weight (kg)	19	19	30	30
Dimensions (h x w x d in mm)	362 x 258 x 218	362 x 258 x 218	444 x 328 x 240	444 x 328 x 240
STANDARDS				
Safety	EN 60335-1, EN 60335-2-29			
Emission, Immunity	EN55014-1, EN 55014-2, EN 61000-3-3			
1) Can be adjusted to 60 Hz; 120 V 60 Hz on request 2) Protection key: a) output short circuit b) overload c) battery voltage too high 3) Non linear load, crest factor 3:1 4) At 25 °C ambient 5) Switches off when no external AC source available 6) Programmable relay that can be set for general alarm, DC undervoltage or genset start/stop function AC rating: 230V/4A DC rating: 4A up to 35VDC, 1A up to 60VDC d) battery voltage too low e) temperature too high f) 230 VAC on inverter output g) input voltage ripple too high				



Digital Multi Control

This panel is intended both for MultiPlus and Quattro units. Allows PowerControl and PowerAssist current limit setting for two AC sources: a generator and shore-side current for example. Setting range: up to 200 Amps. The brightness of the LEDs is automatically reduced during night time.



Computer controlled operation and monitoring

Several interfaces are available:

- **MK2.2 VE.Bus to RS232 converter**
Connects to the RS232 port of a computer (see 'A guide to VEConfigure')
- **MK2-USB VE.Bus to USB converter**
Connects to a USB port (see 'A guide to VEConfigure')
- **VE.Net to VE.Bus converter**
Interface to VE.Net (see VE.Net documentation)
- **VE.Bus to E-PLEX converter**
Interface to the E-PLEX System. The world's most advanced and field proven digital switching and monitoring system.
- **Victron Global Remote**
The Global Remote is a modem which sends alarms, warnings and system status reports to cellular phones via text messages (SMS). It can also log data from Victron Battery Monitors, Multi's, Quattro's and Inverters to a website through a GPRS connection. Access to this website is free of charge.



BMV-600 Battery Monitor

The BMV-600 Battery Monitor features an advanced microprocessor control system combined with high resolution measuring systems for battery voltage and charge/discharge current. Besides this, the software includes complex calculation algorithms, like Peukert's formula, to exactly determine the state of charge of the battery. The BMV-600 selectively displays battery voltage, current, consumed Ah or time to go. The monitor also stores a host of data regarding performance and use of the battery. Several models available (see battery monitor documentation).

Phoenix inverters

1200VA - 5000VA (per module)



Phoenix Inverter 12/5000

SinusMax - Superior engineering

Developed for professional duty, the Phoenix range of inverters is suitable for the widest range of applications. The design criteria have been to produce a true sine wave inverter with optimised efficiency but without compromise in performance. Employing hybrid HF technology, the result is a top quality product with compact dimensions, light in weight and capable of supplying power, problem-free, to any load.

Extra start-up power

A unique feature of the SinusMax technology is very high start-up power. Conventional high frequency technology does not offer such extreme performance. Phoenix inverters, however, are well suited to power up difficult loads such as refrigeration compressors, electric motors and similar appliances.

Virtually unlimited power thanks to parallel and 3-phase operation capability

Up to 6 units inverters can operate in parallel to achieve higher power output. Six 24/5000 units, for example, will provide 24kW / 30kVA output power. Operation in 3-phase configuration is also possible.

To transfer the load to another AC source: the automatic transfer switch

If an automatic transfer switch is required we recommend using the MultiPlus inverter/charger instead. The switch is included in these products and the charger function of the MultiPlus can be disabled. Computers and other electronic equipment will continue to operate without disruption because the MultiPlus features a very short switchover time (less than 20 milliseconds).

Computer interface

All models have a RS-485 port. All you need to connect to your PC is our MK2 interface (see under accessories). This interface takes care of galvanic isolation between the inverter and the computer, and converts from RS-485 to RS-232. A RS-232 to USB conversion cable is also available. Together with our VEConfigure software, which can be downloaded free of charge from our website, all parameters of the inverters can be customised. This includes output voltage and frequency, over and under voltage settings and programming the relay. This relay can for example be used to signal several alarm conditions, or to start a generator. The inverters can also be connected to VENet, the new power control network of Victron Energy, or to other computerised monitoring and control systems.

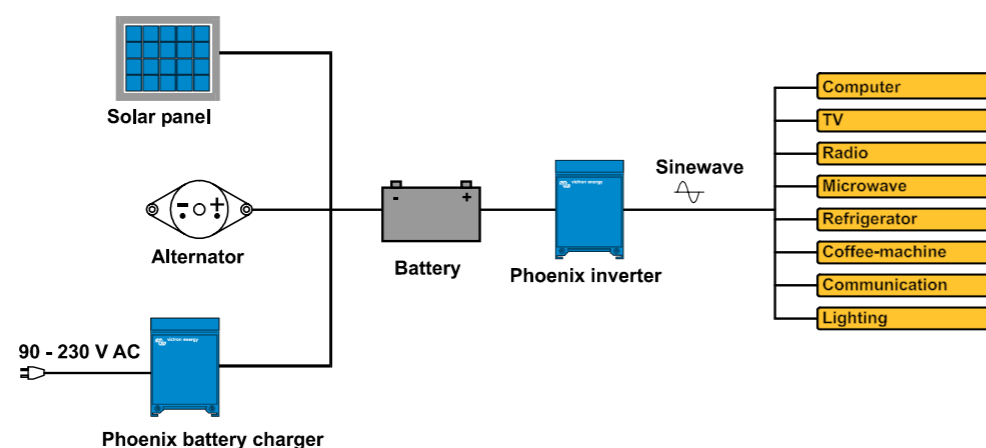
New applications of high power inverters

The possibilities of paralleled high power inverters are truly amazing. For ideas, examples and battery capacity calculations please refer to our book "Energy Unlimited" (available free of charge from Victron Energy and downloadable from www.victronenergy.com).



Phoenix Inverter Compact 24/1600

APPLICATION EXAMPLE



Phoenix Inverter	C 12/1200 C 24/1200	C12/1600 C 24/1600	C 12/2000 C 24/2000	12/3000 (3) 24/3000 (3) 48/3000 (3)	12/5000 (3) 24/5000 (3) 48/5000 (3)
Parallel and 3-phase operation	Yes				
INVERTER					
Input voltage range (V DC)	9,5 – 17,0	9,5 – 17,0	9,5 – 17,0	9,5 – 17,0	9,5 – 17,0
Output	Output voltage: 230 VAC ±2% Frequency 50 Hz ± 0,1% (1)				
Cont. output power at 25 °C (VA) (2)	1200	1600	2000	3000	5000
Cont. output power at 25 °C (W)	1000	1300	1600	2500	4000
Cont. output power at 40 °C (W)	900	1200	1450	2000	3000
Peak power (W)	2400 2400	3000 3000	4000 4000	6000 6000 6000	8000 9000 9000
Max. efficiency 12/ 24 / 48 V (%)	92 / 94	92 / 94	92 / 92	92 / 94 / 95	92 / 94 / 95
Zero-load power 12 / 24 / 48 V (W)	8 / 10	8 / 10	9 / 11	15 / 15 / 16	20 / 25 / 25
Zero-load power in AES mode (W)	5 / 8	5 / 8	7 / 9	10 / 10 / 12	15 / 20 / 20
Zero-load power in Search mode (W)	2 / 3	2 / 3	3 / 4	4 / 5 / 5	5 / 5 / 6
GENERAL					
Programmable relay (3)	Yes				
Protection (4)	a - g				
VE.Bus communication port	For parallel and three phase operation, remote monitoring and system integration				
Common Characteristics	Operating temperature range: -20 to +50 °C (fan assisted cooling) Humidity (non condensing): max 95%				
ENCLOSURE					
Common Characteristics	Material & Colour: aluminum (blue RAL 5012)				Protection category: IP 21
Battery-connection	battery cables of 1.5 meter included	M8 bolts	2+2 M8 bolts	2+2 M8 bolts	
230 V AC-connection	G-ST18i plug	Spring-clamp		Screw terminals	
Weight (kg)	10	12	18	30	
Dimensions (hxwxhd in mm)	375x214x110	520x255x125	362x258x218	444x328x240	
STANDARDS					
Safety	EN 60335-1				
Emission / Immunity	EN 55014-1 / EN 55014-2				
Automotive Directive	2004/104/EC		2004/104/EC		
			1) Can be adjusted to 60Hz and to 240V 2) Non linear load, crest factor 3:1 3) Programmable relay that can a.o. be set for general alarm, DC undervoltage or genset start/stop function. AC rating: 230V/4A DC rating: 4a up to 35VDC, 1A up to 60VDC		
			4) Protection key: a) output short circuit b) overload c) battery voltage too high d) battery voltage too low e) temperature too high f) 230 V SV on inverter output g) input voltage ripple too high		



Phoenix Inverter Control

This panel can also be used on a MultiPlus inverter/charger when an automatic transfer switch but no charger function is desired. The brightness of the LEDs is automatically reduced during night time.



Computer controlled operation and monitoring

Several interfaces are available:

- **MK2.2 VE.Bus to RS232 converter**
Connects to the RS232 port of a computer (see 'A guide to VEConfigure')
- **MK2-USB VE.Bus to USB converter**
Connects to a USB port (see 'A guide to VEConfigure')
- **VE.Net to VE.Bus converter**
Interface to VE.Net (see VE.Net documentation)
- **VE.Bus to E-PLEX converter**
Interface to the E-PLEX System. The world's most advanced and field proven digital switching and monitoring system.
- **Victron Global Remote**
The Global Remote is a modem which sends alarms, warnings and system status reports to cellular phones via text messages (SMS). It can also log data from Victron Battery Monitors, Multi's, Quattro's and Inverters to a website through a GPRS connection. Access to this website is free of charge.



BMV-600 Battery Monitor

The BMV-600 Battery Monitor features an advanced microprocessor control system combined with high resolution measuring systems for battery voltage and charge / discharge current. Besides this, the software includes complex calculation algorithms, like Peukert's formula, to exactly determine the state of charge of the battery. The BMV-600 selectively displays battery voltage, current, consumed Ah or time to go. The monitor also stores a host of data regarding performance and use of the battery.

Several models available (see battery monitor documentation).

Victron Energy **Blue Power**

Are you interested in cutting costs, and embracing corporate social responsibility while doing so?
Victron Energy offers a wide range of Hybrid Power Solutions for off-grid Base Transmission Stations (BTS).



Victron Energy bv

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Of course you are always welcome to visit our website: www.victronenergy.com.

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