Manual & Drawing Multi RS Solar 48/6000 DT Smart LiFePO4 48V 400Ah smallBMS SmartSolar MPPT RS 450 | 100-Tr Cerbo GX Touch 50

(48V/230V/50Hz)

Solar Application with: Multi RS Solar 48/6000 Dual Tracker, 4 x Smart LiFePO4 25.6V 200Ah-a to make 400Ah 48V, smallBMS, SmartSolar MPPT RS 450 | 100-Tr, Cerbo GX and a Touch 50 Display.

What is this drawing about ?
This drawing can be used as a basic plan and as an example to setup off-grid solar applications where AC power is required for 230V/50Hz AC.

This Victron system works as follows:
This system has been built around the Multi RS Solar 48/6000 DT with 4 x 200Ah 24 Volt series connected Li batteries resulting to 48V 400Ah total battery capacity. Protection of the Li batteries from a charge and discharge point of view is in good hands with use of the smallBMS.
The Multi RS Solar is able to charge the batteries from 3 Power sources:
AC Grid power, the built in MPPT trackers, and by using the AC output from a separate connected PV inverter (*not present in this drawing*). The optional SmartSolar MPPT RS 450 | 100-Tr can also be used as an extra charge possibility to charge the batteries.

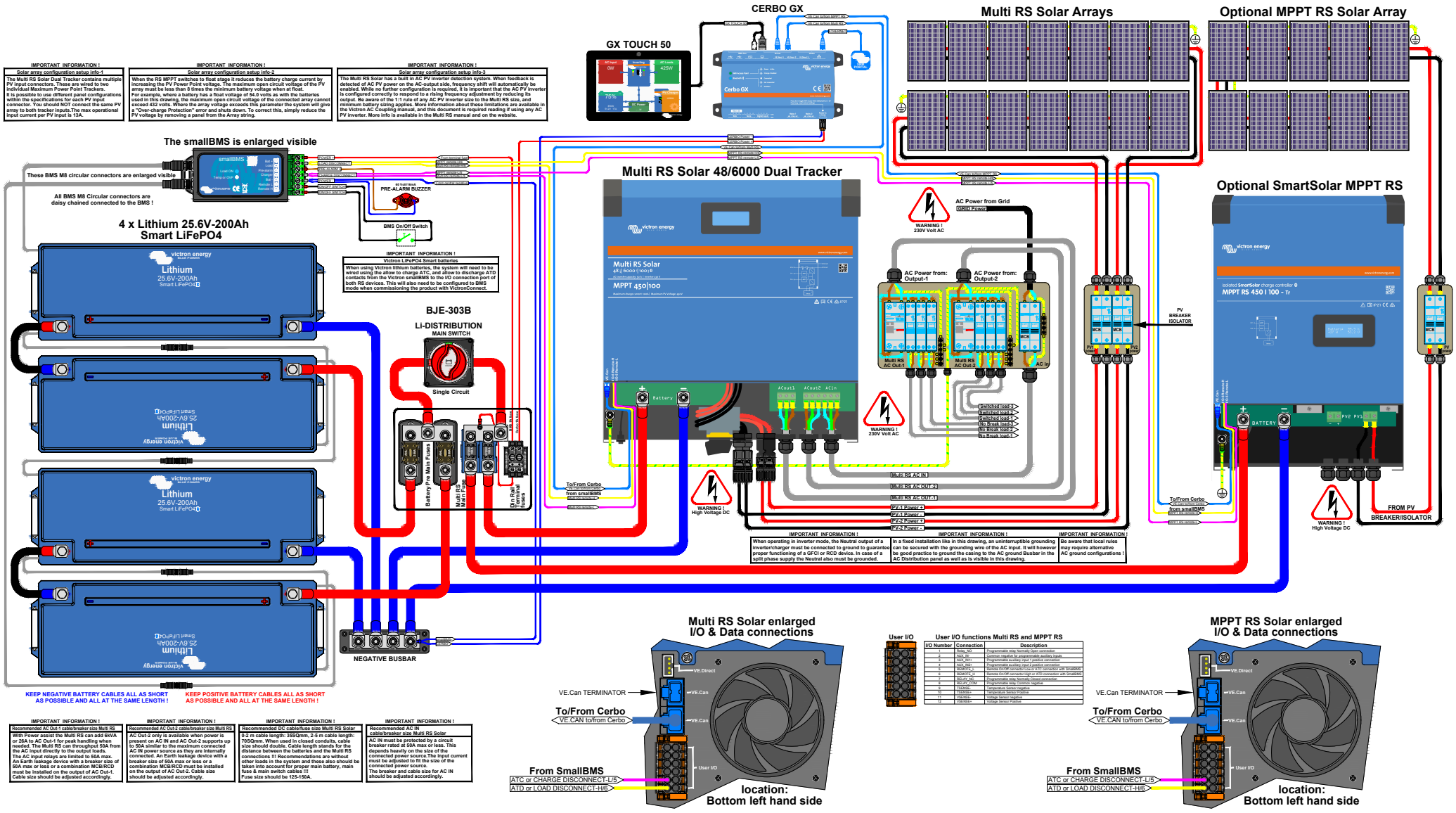
There are three charge possibilities available in this drawing:
1. AC Grid Power that will enable the 6kVA Multi RS Solar to charge with about 88 Amps towards the Li batteries.
2. DC Solar Power that will enable the two built in MPPT trackers of the Multi RS Solar to charge with about 100A towards the Li batteries. The total Charge capacity depends on the size of each individual installed Solar array.
3. DC Solar Power from the optional SmartSolar MPPT RS 450 | 100-Tr.
   This device is able to charge with 100A towards the Li batteries. The total Charge capacity depends on the size of the installed Solar array(s).

Charge combinations of the two above mentioned devices also are possible with a maximum combined total of 200A (DC). This falls inline with the recommended charge current for the two 48V strings of Victron LFP Smart 25,6/200-a batteries.

There are no DC Loads or users like lights, pumps, and so on connected in this drawing, but that can also be made possible. Adding them would require a change in setup where the smallBMS needs to be replaced by the Lynx Smart BMS to protect the batteries from over discharging and to maintain SoC accuracy.

AC Power will be available from the 6kVA Multi RS Solar DT the moment it has been switched on. This means that without any AC power on the input, the Multi RS will give you 6kVA of inverter power on AC OUT-1. The moment AC Power is available on input AC IN of the Multi RS, AC Power will be used to charge the batteries and also is available for loads connected to AC OUT-1 and AC OUT-2. The second AC output AC OUT-2 is live only when AC power is available on AC IN of the Multi RS.
With use of the Cerbo GX one can adjust the available AC Grid power to the maximum AC current the Multi RS will use and this is where the Power Assist function comes into play.
Power Assist supplements AC inverter power to (for instance) a limited Grid power connection when needed.

All information about the system and its connected Victron devices are clearly visible on the GX Touch 50 Screen that is connected to the Cerbo GX. All AC Input power and AC Loads are clearly visible as well. Here you can monitor the state of charge (SoC) from your Li batteries.
You can also exactly see what discharge current runs away and what charge current comes into the batteries from the AC charger of the Multi RS and the MPPT's of the Multi RS.


IMPORTANT INFORMATION !
Solar array configuration setup info-1
The Multi RS Solar Dual Tracker contains multiple PV input connectors. These are wired to two individual Maximum Power Point Trackers.
It is possible to use different panel configurations within the specifications for each PV input connector. You should NOT connect the same PV array to both tracker inputs.The max operational input current per PV input is 13A.
IMPORTANT INFORMATION !
Solar array configuration setup info-2
When the RS MPPT switches to float stage it reduces the battery charge current by increasing the PV Power Point voltage. The maximum open circuit voltage of the PV array must be less than 8 times the minimum battery voltage when at float.
For example, where a battery has a float voltage of 54.0 volts as with the batteries used in this drawing, the maximum open circuit voltage of the connected array cannot exceed 432 volts. Where the array voltage exceeds this parameter the system will give a "Over-charge Protection" error and shuts down. To correct this, simply reduce the PV voltage by removing a panel from the Array string.
IMPORTANT INFORMATION !
Solar array configuration setup info-3
The Multi RS Solar has a built in AC PV inverter detection system. When feedback is detected of AC PV power on the AC-output side, frequency shift will automatically be enabled. While no further configuration is required, it is important that the AC PV inverter is configured correctly to respond to a rising frequency adjustment by reducing its output. Be aware of the 1:1 rule of any AC PV inverter size to the Multi RS size, and minimum battery sizing applies. More information about these limitations are available in the Victron AC Coupling manual, and this document is required reading if using any AC PV inverter. More info is available in the Multi RS manual and on the website.
CERBO GX
GX TOUCH 50
Multi RS Solar Arrays
Optional MPPT RS Solar Array
The smallBMS is enlarged visible
These BMS M8 circular connectors are enlarged visible
All BMS M8 Circular connectors are daisy chained connected to the BMS !
PRE-ALARM BUZZER
BMS On/Off Switch
4 x Lithium 25.6V-200Ah Smart LiFePO4
IMPORTANT INFORMATION !
Victron LiFePO4 Smart batteries
When using Victron lithium batteries, the system will need to be wired using the allow to charge ATC, and allow to discharge ATD contacts from the Victron smallBMS to the I/O connection port of both RS devices. This will also need to be configured to BMS mode when commissioning the product with VictronConnect.
Multi RS Solar 48/6000 Dual Tracker
Multi RS Solar 48 | 6000 | 100 | R
MPPT 450|100
BJE-303B
Li-DISTRIBUTION
MAIN SWITCH
Single Circuit
Battery Pre Main Fuses
Multi RS Main Fuse
Dist Rail Terminal Fuses
NEGATIVE BUSBAR
WARNING ! 230V Volt AC
AC Power from Grid
AC Power from: Output-1
AC Power from: Output-2
PV BREAKER ISOLATOR
Optional SmartSolar MPPT RS
isolated SmartSolar charge controller
MPPT RS 450 | 100 - Tr
WARNING ! High Voltage DC
FROM PV BREAKER/ISOLATOR
To/From Cerbo from smallBMS
Switched load-1
Switched load-2
Switched load-3
No Break load-1
No Break load-2
Multi RS AC IN
Multi RS AC OUT-2
Multi RS AC OUT-1
PV-1 Power +
PV-1 Power -
PV-2 Power +
PV-2 Power -
IMPORTANT INFORMATION !
When operating in inverter mode, the Neutral output of a inverter/charger must be connected to ground to guarantee proper functioning of a GFCI or RCD device. In case of a split phase supply the Neutral also must be grounded.
IMPORTANT INFORMATION !
In a fixed installation like in this drawing, an uninterruptible grounding can be secured with the grounding wire of the AC input. It will however be good practice to ground the casing to the AC ground Busbar in the AC Distribution panel as well as is visible in this drawing.
IMPORTANT INFORMATION !
Be aware that local rules may require alternative AC ground configurations !
KEEP NEGATIVE BATTERY CABLES ALL AS SHORT AS POSSIBLE AND ALL AT THE SAME LENGTH !
KEEP POSITIVE BATTERY CABLES ALL AS SHORT AS POSSIBLE AND ALL AT THE SAME LENGTH !
IMPORTANT INFORMATION !
Recommended AC Out-1 cable/breaker size Multi RS
With Power assist the Multi RS can add 6kVA or 26A to AC Out-1 for peak handling when needed. The Multi RS can throughput 50A from the AC input directly to the output loads.
The AC input relays are limited to 60A max.
An Earth leakage device with a breaker size of 50A max or less or a combination MCB/RCD must be installed on the output of AC Out-1.
Cable size should be adjusted accordingly.
IMPORTANT INFORMATION !
Recommended AC Out-2 cable/breaker size Multi RS
AC Out-2 only is available when power is present on AC IN and AC Out-2 supports up to 50A similar to the maximum connected AC IN power source as they are internally connected. An Earth leakage device with a breaker size of 50A max or less or a combination MCB/RCD must be installed on the output of AC Out-2. Cable size should be adjusted accordingly.
IMPORTANT INFORMATION !
Recommended DC cable/fuse size Multi RS Solar
0-2 m cable length: 35SQmm, 2-5 m cable length: 70SQmm. When used in closed conduits, cable size should double. Cable length stands for the distance between the batteries and the Multi RS connections !!! Recommendations are without other loads in the system and these also should be taken into account for proper main battery, main fuse & main switch cables !!!
Fuse size should be 125-150A.
IMPORTANT INFORMATION !
Recommended AC IN cable/breaker size Multi RS Solar
AC IN must be protected by a circuit breaker rated at 50A max or less. This depends heavily on the size of the connected power source.The input current must be adjusted to fit the size of the connected power source.
The breaker and cable size for AC IN should be adjusted accordingly.
Multi RS Solar enlarged I/O & Data connections
VE.Can TERMINATOR
To/From Cerbo
VE.CAN to/from Cerbo
From SmallBMS
ATC or CHARGE DISCONNECT-L/5
ATD or LOAD DISCONNECT-H/6
location: Bottom left hand side
User I/O
User I/O functions Multi RS and MPPT RS
I/O Number | Connection | Description
1 | Relay_NO | Programmable relay Normally Open connection
2 | AUX_In- | Common negative for programmable auxiliary inputs
3 | AUX_IN1+ | Programmable auxiliary input 1 positive connection
4 | AUX_IN2+ | Programmable auxiliary input 2 positive connection
5 | REMOTE_L- | Remote On-Off connector Low or ATC connection with SmallBMS
6 | REMOTE_H+ | Remote On-Off connector High or ATD connection with SmallBMS
7 | RELAY_NC | Programmable relay Normally Closed connection
8 | RELAY_COM | Programmable relay Common negative
9 | TSENS- | Temperature Sensor negative
10 | TSENS+ | Temperature Sensor Positive
11 | VSENS- | Voltage Sensor negative
12 | VSENS+ | Voltage Sensor Positive
MPPT RS Solar enlarged I/O & Data connections
VE.Can TERMINATOR
To/From Cerbo
VE.CAN to/from Cerbo
From SmallBMS
ATC or CHARGE DISCONNECT-L/5
ATD or LOAD DISCONNECT-H/6
location: Bottom left hand side

You can then rest assured that you are in control of your AC and DC power availability.
More info about the system and its individual Victron parts used in this installation are explained in more details down below.

This is how the system has been setup: Around the Victron Lithium Batteries 25.6V Smart, Battery Pre-Main fuses, Main switch and Main fuses for the Multi RS Solar and the optional SmartSolar MPPT RS.
Both strings of series connected 2 x 200Ah 24 Volt Li batteries are resulting to 48V 400Ah total battery capacity. Positive power from each series connected Li battery string runs to an individual ANL Main fuse holder with a 200A/80V fuse inside. The top of each main fuse holder has been bridged with a piece of Copper Busbar. From the centre connection of the Positive Busbar power runs further to a Victron Main switch and from the Main switch Positive power continues to another Positive Busbar connecting two Mega fuse holders.
Each Mega fuse holder holds a 150A BF2/58V fuse, one for the Multi RS Solar and one for the SmartSolar MPPT RS. From each 150A fuse, a positive power cable runs to the Multi RS Solar and the SmartSolar MPPT RS positive power connections.
Negative power from both series connected strings of 2 x 200Ah 24 Volt Li batteries runs to a Victron negative Busbar. From the negative Busbar, a negative power cable runs to the Multi RS Solar and the SmartSolar MPPT RS negative power connections.

On the right hand side of the Mega fuse holders you will find two Din Rail terminal fuse holders. These are used to feed positive power to the smallBMS and the Cerbo GX.
The fuses used are 5x20mm models.
Power for both terminal fuse holders comes from the centre position of the Mega fuse holders Positive Busbar and is connected to the bottom side of the left terminal fuse holder.
The terminal fuse holders are bridged together with a 2 way linking bridge.
The SmallBMS receives positive power through a 1A fuse connected to its BAT+ connection coming from the left hand site terminal fuse holder. Negative power for the SmallBMS connected to its BAT- connection comes from the negative Busbar.
The Cerbo GX receives positive power through a 1A fuse connected to its Power in + connection coming from the right hand site terminal fuse holder. Negative power for the Cerbo GX connected to its Power in - connection comes from the negative Busbar.

The terminal fuse holders and the Mega fuse holders both are fitted out with a Din rail click on system and this makes it very easy to install and use.

About the used main-fuses:
It is important to use main fuses that are made for the system Voltage in use.
Here that can vary a bit between 50-58V max.
Regarding the interrupting capacity IC of a main fuse and its purpose:
The down stream principle should be taken into account from high to low where the higher IC rating needs to be used for the Li batteries and the lower IC rating for the users downstream.

smallBMS:
The smallBMS is enlarged visible directly above the batteries. The BMS is the controlling safety component of the system as this device protects the LiFePO4 batteries against over Voltage, under Voltage and high temperature. The Victron Lithium Batteries 25.6V Smart have an integrated Balancing, Temperature and Voltage control (acronym: BTV) and connect to the BMS with two M8 BTV circular connector cable sets. The M8 BTV cables of several batteries can be daisy-chained like in this drawing with 2 series connected strings of batteries. When cables are not long enough, extensions cables are available in several lengths from your Victron dealer which will suit your purpose. The protective part of the BMS for the Li batteries is called Charge Disconnect and Load Disconnect. You can see all these connections clearly on the left hand side of the smallBMS.

For the RS series in combination with a smallBMS Victron created the 2 wire BMS mode that makes connecting these device very easy and all you need to do is the following:
The Charge Disconnect and Load Disconnect outputs of the BMS need to be connected to both devices, the Multi RS and the SmartSolar MPPT RS. You can clearly see where these connections have to be made in the enlarged I/O & Data connections that are visible below each device.

The standard available wire bridge in both RS devices between L5 and H6 needs to be removed.

The Charge Disconnect contact of the smallBMS will stop connected devices from charging to prevent Cell over-Voltage or a Cell temperature that runs too high like used in this drawing.

The Load Disconnect contacts of the smallBMS will stop connected devices from discharging when the Battery Voltage has decreased below a preset value like used in this drawing.

Charge Disconnect output:
The purple wire for the Multi RS has to be connected to L/5 of its I/O & Data connections.
The purple wire for the MPPT RS has to be connected to L/5 of its I/O & Data connections.
Load Disconnect output:
The yellow wire for the Multi RS has to be connected to H/6 of its I/O & Data connections.
The yellow wire for the MPPT RS has to be connected to H/6 of its I/O & Data connections.

The 2 wire BMS mode can be enabled with VictronConnect and will be explained later.

Despite that the MPPT RS is not capable of discharing, you need to make the yellow wire connection as described above as both wires are needed for the smallBMS to control the MPPT RS properly.

The BMS can generate a Pre-Alarm signal to warn of an imminent Cell under-Voltage.
By using a Pre-Alarm Piezo Buzzer as shown in the drawing, the buzzer will sound and this will give you about 30 seconds to start a charge or to switch off devices preventing a load disconnect.
Power for the Buzzer comes from the Pre-alarm + output connection and from the Negative Bat- connection.

Instead of the standard available wire bridge between the BMS Remote-L and Remote-H connections you can install a small BMS ON/OFF switch (also visible in this drawing).
You can decide whether or not to use this switch. If you decide to use the BMS ON/OFF switch, make sure to mount it away/out of sight from little kid's hands otherwise you might be in the dark quite suddenly !

Cerbo GX with GX Touch 50 Display:
The Cerbo GX with its GX Touch 50 Display is visible above the Multi RS Solar.
The Cerbo together with the GX Touch 50 Display is the monitoring heart of your installation showing you what is going on with all connected devices. Monitoring of your installation can be done either with the Cerbo in front of you or from anywhere in the world using an internet connection as shown in the drawing with the Victron VRM portal either using the VictronConnect app or website. The Cerbo also provides Remote Firmware updates and allows settings to be changed Remotely. Whatever you connect to a Cerbo can be made visible on the GX Touch 50 display or with: Remote Console, VRM Dashboard, Advanced VRM Widgets, VRM App Widgets, and VE.Can/NMEA 2000. This all has been clearly explained in the Cerbo manual.

The positive power for the Cerbo comes through a 1A fuse placed inside a terminal fuse holder including its negative from the negative Busbar as explained above with the Main fuses.
The GX Touch 50 Display HDMI connector with attached USB power cable obviously has to go into the HDMI port of the Cerbo and the USB cable directly next to it. The VE.Can bus cables coming from the Multi RS Solar and from the SmartSolar MPPT RS both connect to a VE.Can port of the Cerbo. Don't forget that both open VE.Can ports at the Multi RS and the MPPT RS need a terminator in each open Can bus port (see enlarged I/O & Data connections).
The Ethernet cable and its connector, to connect to the VRM Portal (if available), will go into the Network port of the Cerbo. No VE.Direct cable or VE.Bus cable are necessary in this drawing.
These are all the connections you have to make for the Cerbo. There is plenty more you can connect and do with a Cerbo and that all is very well explained in its manual.

Multi RS Solar 48/6000 Inverter/Charger with a Dual MPPT tracker of 450V 100A max:
Below the Cerbo GX with its GX Touch 50 Display you will find the Multi RS 48/6000 DT.
The Multi RS should be mounted in such a way that it can cool itself down properly and the space where it is in should be dry and well ventilated. Free space above and below the device should be

at least 30cm. Don't box the device in as this will certainly have a bad effect on its functioning and service life.

The Multi RS has a built-in battery monitor. This monitor is needed to measure what the charge/discharge current is and this monitor can also be used to program the functionality of the build-in programmable relay (as explained in the manual).

Most connections to and from the Multi RS already have been discussed except for the built in Dual MPPT PV connections. It might be a good idea to have them all together here:
Positive DC power for the Multi RS comes from the right hand side Mega fuse holder holding a 150A fuse. Negative DC power for the Multi RS comes from the negative busbar visible below the main fuses.

Incoming AC Grid power passes through an incoming AC breaker panel towards the Multi RS AC IN connections. AC OUT-1 of the Multi RS is connected to an AC breaker panel and from the breaker panel onward these are NO Break AC outputs and as the name suggests are constantly powered by the Multi RS Inverter.
AC OUT-2 of the Multi RS is also connected to an AC breaker panel and from the breaker panel onward these are switched AC outputs and as the name here suggest are switched off when there is no incoming AC power available. AC OUT-2 is live only when AC power is available on the input of the Multi RS as this output is internally directly connected to the input.

The AC breaker panels AC OUT-1, AC-OUT-2 and AC IN need to be seen as an example.
It is however very important that combination MCB/RCD or GFCI breakers are installed on each output of the Multi RS before connecting to a row of specific sized breakers for users.
Also check the local requirements for this !

AC IN must be protected by a circuit breaker rated at 50A max or less. This depends heavily on the size of the connected AC power source.The input current must be adjusted to fit the size of the connected power source. The breaker and cable size for AC IN should be adjusted accordingly.

With Grid power present on the AC input, the Multi RS can throughput 50A from the AC input directly to the output loads. The AC input relays however are limited to 50A max and to prevent overloading it is very important to install an Earth leakage device with a breaker of 50A max or less or a combination MCB/RCD device of 50A max or less must be installed on the output of AC Out-1. Cable size should be adjusted accordingly.
Power Assist can supplement AC inverter power to (for instance) a limited Grid power connection when needed. Without Grid power on the AC input, 6kVA of AC inverter power will be available on AC Out-1.

AC Out-2 only is available when power is present on AC IN and AC Out-2 supports up to 50A similar to the maximum connected AC IN power source as they are internally connected.
An Earth leakage device with a breaker of 50A max or less or a combination MCB/RCD device of 50A max or less must be installed on the output of AC Out-2. Cable size should be adjusted accordingly.

In a fixed installation like in this drawing, an uninterruptible grounding can be secured with the grounding wire of the AC input. It will however be good practice to ground the casing of the Multi RS to the PE/Ground Busbar in the AC Distribution panel as well, as is visible in this drawing.
The Case Ground cable should be able to carry the full ground current of at least 50A as this is the same maximum current the Multi RS can handle.
Be aware that local rules may require alternative AC ground configurations.

The Multi RS Solar in this drawing is a Dual tracker model with dedicated PV input connectors for each tracker. This means one PV array per input and these should be completely isolated from each other and can not be mixed. It is possible to use different panel configurations within the specifications for each PV input. The maximum total operational input current per tracker is 13A.
The tracker inputs are protected against reverse polarity to a max. short circuit current of 16A.

DC power from each solar array first passes through a PV breaker/Isolator before connecting to the MC4 PV input connections of the Multi RS PV+ and PV-. The size in Amps of the PV breakers/ Isolators depends on the total size of each solar array. The PV breakers/Isolators will also help to connect the Multi RS MPPT PV inputs in a safe and responsible way.

WARNING: Do not underestimate the power coming from a solar array.
These DC Voltages can easily go up to 450V and are absolutely lethal !!!

When the Multi RS MPPT switches to float stage it reduces the battery charge current by increasing the PV Power Point voltage. The maximum open circuit voltage of the PV array must be less than 8 times the minimum battery voltage when at float.
For example, where a battery has a float voltage of 54.0 volts, the maximum open circuit voltage of the connected array cannot exceed 432 volts. Where the array voltage exceeds this parameter the system will give a "Over-charge Protection" error and shut down. To correct this, either increase the battery float voltage, or reduce PV voltage by removing PV panels from the string to bring the voltage back within specification.

The VE.Can connections and the user IO ports have already been explained with the smallBMS.
The VE.Direct port is not in use here.

The Multi RS itself will test for sufficient resistive isolation between PV+ and GND, and PV- and GND. In the event of a resistance below the threshold (indicating an earth fault), the unit will stop charging and display the error and send the error signal to the GX device for audible and/or email notification.

Ground the Frame of the PV array to local requirements.

When in doubt about how to continue with the ground connections, consult your Victron dealer.
Read the Multi RS manual carefully to proceed further.

Optional SmartSolar MPPT RS 450 | 100A-Tr

Below the Solar Array you will find the optional marked SmartSolar MPPT RS.
The MPPT RS should be mounted in such a way that it can cool itself down properly and the space where it is in should be dry and well ventilated. Free space above and below the device should be at least 30cm. Don’t box the device in as this will certainly have a bad effect on its functioning and service life.

Most connections to and from the MPPT RS already have been discussed except for the built in MPPT PV connections. It might be a good idea to have them all together here:
Positive DC power from the MPPT RS connects to the left hand side Mega fuse holder holding a 150A fuse. Negative DC power from the MPPT RS connects to the negative busbar visible below the main fuses.

The MPPT RS in this drawing also is a Dual tracker model with dedicated PV input connectors for each tracker. This means one PV array per input and these should be completely isolated from each other and can not be mixed. It is possible to use different panel configurations within the specifications for each PV input. The maximum total operational input current per tracker is 18A. The tracker inputs are protected against reverse polarity to a max short circuit current of 20A.

DC power from the visible solar array for the MPPT RS first passes through a PV breaker/Isolator before connecting to the PV1 Plus & Minus connection terminals. The size in Amps of the PV breaker/Isolator depends on the total size of the connected solar array. The PV breaker/Isolator will also help to connect the MPPT RS MPPT PV inputs in a safe and responsible way.
Only one tracker (PV1) is in use here.

WARNING: Do not underestimate the power coming from a solar array.
These DC Voltages can easily go up to 450V and are absolutely lethal !!!
When the MPPT RS switches to float stage it reduces the battery charge current by increasing the PV Power Point voltage.

The maximum open circuit voltage of the PV array must be less than 8 times the minimum battery voltage when at float.
For example, where a battery has a float voltage of 54.0 volts, the maximum open circuit voltage of the connected array cannot exceed 432 volts. Where the array voltage exceeds this parameter the system will give a "Over-charge Protection" error and shut down. To correct this, either increase the battery float voltage, or reduce PV voltage by removing PV panels from the string to bring the voltage back within specification.

The VE.Can connections and the user IO ports have already been explained with the smallBMS. The VE.Direct port is not in use here.

The MPPT RS itself will test for sufficient resistive isolation between PV+ and GND, and PV- and GND. In the event of a resistance below the threshold (indicating an earth fault), the unit will stop charging and display the error and send the error signal to the GX device for audible and/or email notification.

Ground the Frame of the PV array to local requirements.

When in doubt about how to continue with the ground connections, consult your Victron dealer. Read the MPPT RS manual carefully to proceed further.

Software settings for all shown Victron devices in this drawing:

- When setting up a new system, it will be good practice to update all Victron devices to the latest available Software/Firmware.
- The four Victron LiFePO4 25,6V 200Ah Smart batteries can be set, monitored and updated with use of the VictronConnect App.
- The Victron Cerbo GX Device can be updated to the latest Firmware in two different ways:
  1 - Update it via the internet, either manually or let it check for new updates every day.
  2 - Update it from a microSD-card or USB-stick. Check the Cerbo manual for this.
- The Victron Multi RS Solar 48/6000 can be set, monitored and updated with use of the VictronConnect App (Multi Platform). The LiFePO4 2 wire BMS mode can be set and enabled in the battery menu with the VictronConnect App.
- The Victron SmartSolar MPPT RS 450|100 can be set, monitored and updated with use of the VictronConnect App (Multi Platform). The LiFePO4 2 wire BMS mode can be set and enabled in the battery menu with the VictronConnect App.

Wiring Calculations:
There are no wire sizes visible in this drawing and there is a good reason why this is not available in any drawing on the Victron website. We at Victron do not know what the physical size of your project is and it therefore will be impossible to give you specific wire sizes that will fit your setup. But there is a very handy tool available from Victron called Victron Toolkit for Android and iPhone users. In this app you will find Cable Calc that will help you size any cable for AC and DC.
This will help you find all the right cable sizes for your project.

Wiring Unlimited:
This is a book freely available for downloading from the Victron Website.
This book is all about electrical wiring for systems containing batteries, inverters, charger, inverter/chargers and so on. With this book Victron aims to explain wiring basics of electrical systems. This book helps to explain the importance of ‘getting it right’ and the issues that might happen when a system has inferior wiring. It also assists electrical installers or users to troubleshoot issues that have arisen from bad wiring. This book will certainly help to get it right and to make sure proper conclusions can be drawn for the electrical systems its readers are involved with.

Using the Victron-Remote-Monitoring / VRM app or website:
Monitoring of your installation can be done either with the Cerbo in front of you or from anywhere in the world using an internet connection as shown in the drawing with the Victron VRM portal either using the VictronConnect app or website. Just login to your VRM account or setup a new one and tap on your account to view your installation. You can for instance set alarm status

information for the state of charge or SoC and this will automatically warn you when a certain level has been reached.
This is extremely useful during periods of absence and..... it is free of charge !
For more info read the latest available VRM manual.
The VRM app is available for Android and iPhone users.

To keep communication of your system going with use of the VRM app or website, you do need an Internet connection to make this work and Victron also has a solution for this with for instance the GX LTE 4G cellular modem. Check it out on the Victron website.

In this drawing you will find the following Victron equipment with some additional needed installation materials:

Victron Part description	Part No.	Amount	Remark
ANL/CNN_E main fuse 200A (80Vdc or less)	Littelfuse	2	Order on line or from your Victron dealer
Battery switch on/off 275A	VBS127010010	1	
Blue Sea ANL Pre-Main fuse holders for the Li batteries	5005	2	
BMS Piezo buzzer and on/off switch if needed	……..		Order on line or from your Victron dealer
Breaker box (PV) Multi RS Solar with 2 x DC breaker isolator for 2 x solar Arrays	……..	1	Order on line or from your Victron dealer
Breaker box (PV) MPPT RS with 1 x DC breaker isolator for 1 x solar Array (2 is possible)	……..	1	Order on line or from your Victron dealer
Breaker box (AC) Multi RS with breakers for AC IN, AC OUT-1 & AC OUT-2	……..	1	Order on line or from your Victron dealer
Busbar 600A 4P + cover	VBB160040010	1	
Busbar (positive) 5x30mm to bridge main fuse holders			Order on line or from your Victron dealer
Cables with M8 circular connector (for Li-ion batteries) Male to Female 3 pole 2 m (bag of 2)	ASS030560200	1	Bag of 2
Cerbo GX	BPP900450100	1	
Fuse holder for 5x20mm fuses made by Phoenix Contact including 2 x 1A fuses for the Cerbo and the smallBMS	UK10-Drehsi 5x20mm	2	Order on line or from your Victron dealer
GX Touch 50 Display	BPP900455050	1	
LiFePO4 Battery 25,6V/200Ah - Smart-a	BAT524120610	4	
MEGA-fuse/BF2 150A/58V	Littelfuse	2	Order on line or from your Victron dealer
Multi RS Solar 48/6000-100-450/100 DT	PMR482602020	1	
Modular fuse holder for Mega-fuses	CIP100200100	2	Order fuses from your Victron dealer
smallBMS	BMS400100000	1	

Victron Part description	Part No.	Amount	Remark
SmartSolar MPPT RS 450|100	SCC145110410	1	
VE.Can cable: from Cerbo to Multi RS Solar and from Cerbo to SmartSolar MPPT RS	……..	2	RJ45 Cable length not known

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