



The universal storage solution for micro-inverters

USER MANUAL


www.batsolpower.com

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Manual

Thank you for purchasing Batsol® and now BatMatch®, the easiest solar storage solution ever. BatMatch® is very powerful energy management solution that allows you to drive up to 110 Batsol®

the way you want. Please read this manual carefully before installing your BatMatch®. It will save you time, money and most of all, fair amounts of clean solar energy.

What is the BatMatch®?

The BatMatch® is a power plant manager. Once connected to one or many Batsol®, it will collect data from each of them such as PV Power or State Of Charge and availability for production as well as many other parameters. It will then mobilize the Batsol® to store excess energy or to make energy available to micro-

inverters. The BatMatch® can be connected to a PC, for servicing and settings, or to internet for remote monitoring.

Items included

In each BatMatch® box, you will find:

- A BatMatch®
- A yellow BatMatch to PC communication cable, 1.5m long
- A blue Batsol® to BatMatch® service cable 1.5m long
- A CD-Rom / USB Key / SD-Card with all needed software
- A quality control sheet with serial number
- A specification sheet
- This manual

Handling and Storage

The BatMatch® is an electronic device. It can be piled up and stored in any position. When not used, it should be kept in a dry and cool place, away from mice and insects. It has been designed to fit on a DIN rail in cabinets next to the main energy meter but can be installed anywhere else. It is IP21 rated so it should be kept safe from water and dust in a closed cabinet or room.

Equipment Needed

For installation

- A set of electrician screwdrivers
- A PC with an Ethernet port and a CD-Rom slot or downloaded software from www.batsolpower.com/downloads

For maintenance and servicing

None. The BatMatch® does not need maintenance. When it is not working, just replace it and send the faulty unit back to the factory. It may need some firmware updates but this can be either done using internet, a PC or an SD card.

Inspection

Upon arrival, check the BatMatch® for visible damage (i.e. cracks, dents, deformation and other visible abnormalities). Verify connectors, assure that they are clean. Plug the 230Vac IEC power plug and power the BatMatch® up to check that it properly turns on.

In case there is a visible problem, please contact your retailer to determine if the BatMatch® needs replacement.

Installation

The BatMatch is an electronic device that uses electricity to operate. Safety rules for low voltage electric power should apply when using it. Please refer to your national electric code for installation rules.

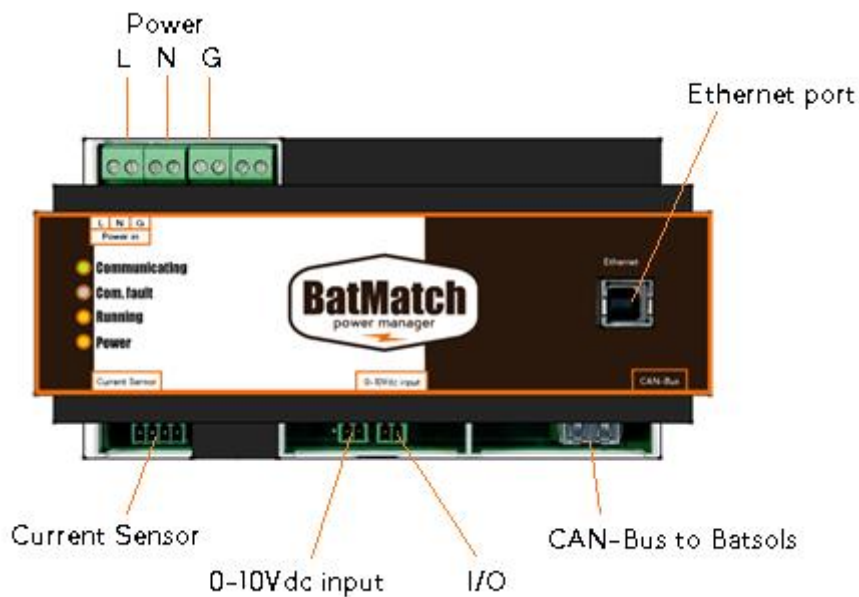
Mechanical installation

The BatMatch® can be wall or DIN rail mounted. If the Current Sensor is used for self-consumption optimization (see “Operating Modes”), the BatMatch should be installed less than 20m far from the Utility Energy Meter. As the BatMatch is IP21 rated, it should be locked into an enclosure protecting it from dust and water. Please make sure that the hanging cables are properly supported on their own by cable clips or other fittings as the BatMatch® connectors are not designed to withstand cable weight or bending.

Electrical installation

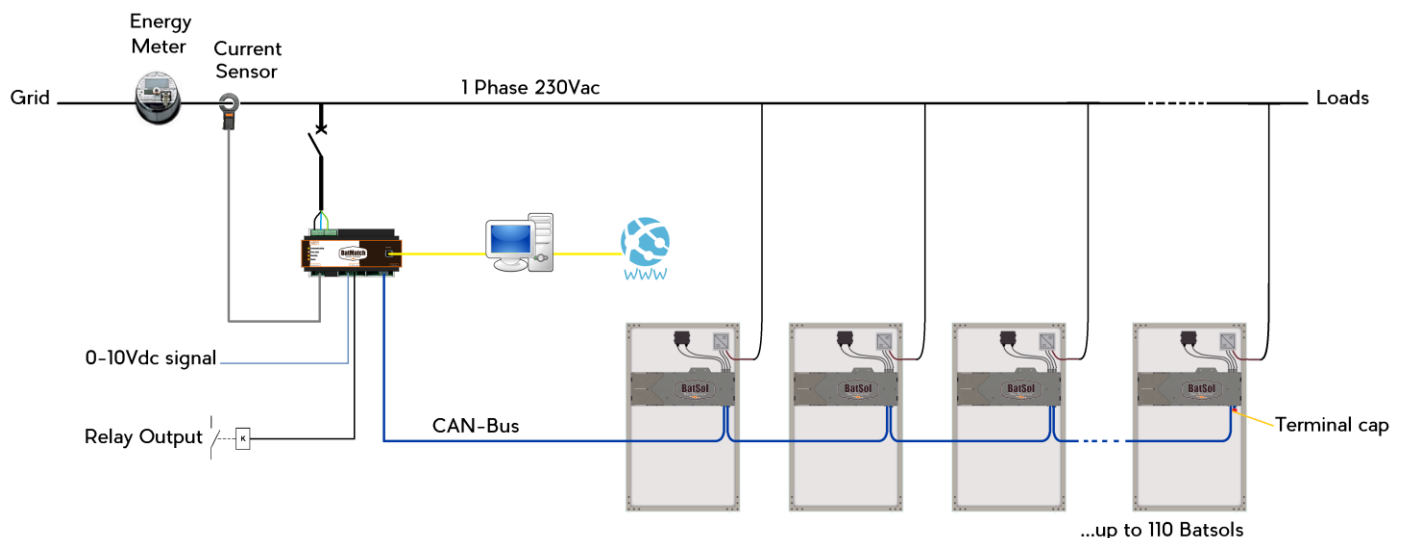
Electrical cabling and connecting should be performed by a qualified electrician according to the local NEC.

The below diagram shows the connectors of the BatMatch® and the related inputs and outputs. All connections should be done with the BatMatch® being turned off.



Standard Wiring Diagram

Standard wiring diagram of the BatMatch



Communication

The BatMatch can either be connected directly to a PC for installation / maintenance using the yellow cable or allow for remote monitoring through Wifi or Ethernet.

Schéma de branchement de la communication Ethernet / Wifi

Procédure de raccordement et paramétrage Ethernet

Procédure de raccordement et paramétrage Wifi

Accessories

Optional Current Sensor

Wiring of the optional Current Sensor for optimized self-consumption

Schéma du raccordement du capteur de courant

Optional 0-10Vdc analog input

Wiring of the optional 0-10Vdc analog drive signal

Schéma de raccordement du signal 0-10Vdc

Operation

Starting up

Once the BatMatch® has been properly installed, connect a PC to the Ethernet port and switch the BatMatch® on using the ON/OFF/RESET button. The BatMatch will first of all check if some Batsols® are connected. If it finds at least one Batsol®, the COM LED will turn green. If no Batsol® can be found, the LED will turn yellow. If a fault has been detected, the LED turns red.

When the LED has lit, the BatMatch is started and be accessed via Ethernet. Connect the PC to the BatMatch using the yellow cable. Open your favorite web browser and type <http://192.168.1.1> on the address bar. You should detect the BatMatch and see the following page appear:

BatMatch First Connection

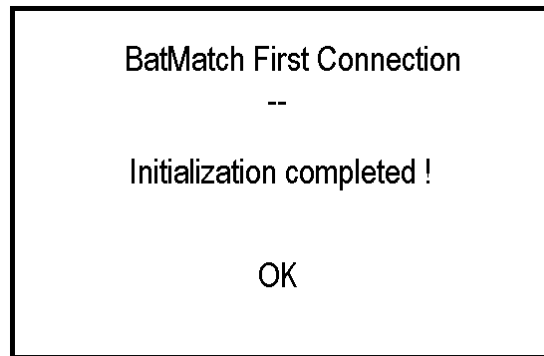
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Would you like to proceed with the
initialization ?

Yes No

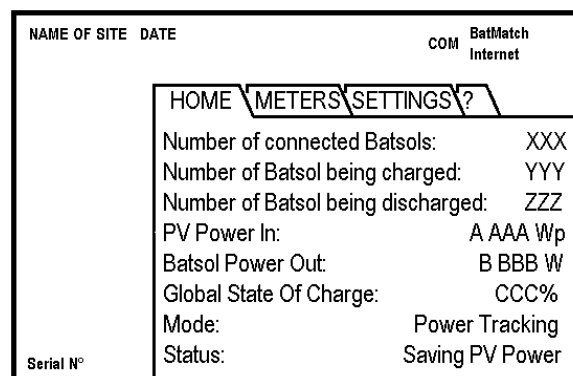
Click on the YES button and follow the requested steps. This is only needed at first starting and whenever the BatMatch is reset holding the ON/OFF/RESET button for more than 5 seconds. You will be requested to provide information such as your location, date and time, and details about your solar generator (number of panels, type of panels, type of micro-inverters...).

Once you have reached the following page, just click OK.



This brings you to the home page of the BatMatch where you will be able to select the operational modes to suit your application.

The Home page looks like this:



Upon starting, the BatMatch automatically goes to the “CHARGE MODE”. Overall system information is available on the HOME page as well as on the METERS page.

Setting the requested Mode

5 operating modes can be chosen:

CHARGE MODE: This is the default mode. Whenever there is a RESET or when the BatMatch is not set to a specific configuration, it will be in this mode. The CHARGE MODE prevents any power use by the micro inverters (the Batsols cannot be discharged) but allows PV charging. The CHARGE MODE eventually leads to all Batsols to be fully charged.

DISCHARGE MODE: This mode allows all the micro-inverters to operate and to empty the Batsol down to their authorized minimum State Of Charge. It can be used to produce a lot of power at once or for testing of the plant. The DISCHARGE MODE prevents any PV charging.

FREE MODE: In this mode, the Batsol are not driven by the BatMatch. They will just be available for PV charging and load feeding at any time. The BatMatch will in this case only be used to monitor the system. This is the mode to select for off-grid or mini-grid systems. In case the BatMatch is turned off, the system automatically goes to this mode.

DIRECT PV MODE: This mode connects the PV directly to the micro-inverter, bypassing the Batsol. The power plant then works as if no Batsol was implemented. It can be used temporarily when the plant has not yet been fully installed. In case the BatMatch is turned off, the system automatically goes to this mode.

ADJUSTMENT MODE: This is the smart mode allowing to optimize self-consumption at any time. In the ADJUSTMENT MODE, the BatMatch drives the Batsol to meet as well as possible the electrical load. The BatMatch gets the load information from three possible different sources:

- A manually input hourly load curve
- An optional Current Sensor
- A 0-10Vdc input signal

This mode is mainly used for grid-tied system.

To set a mode, just go to SETTINGS > MODES and select the mode requested.

The ADJUSTMENT MODE

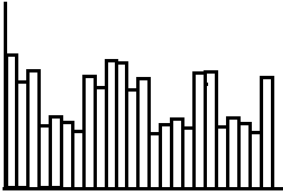
If the ADJUSTMENT MODE is selected, the user is requested to either choose to input a load curve, to set the optional Current Sensor or to set the 0-10Vdc input.

How to input a manual load curve

Go to SETTINGS>MODE>ADJUSTMENT>MANUAL_CURVE.

The hourly values of the power to produce should be input in the below table. Keep in mind that the solar generator cannot produce more than what it has been sized for. When there is not enough energy stored to meet the needs, the system will do its best but grid power will have to be used. On the other hand, if there is excess power available, low demand and only full Batsols, the excess power will be sent to the grid.

MANUAL LOAD CURVE			
0h - 1h		12h - 13h	
1h - 2h		13h - 14h	
2h - 3h		14h - 15h	
3h - 4h		15h - 16h	
4h - 5h		16h - 17h	
5h - 6h		17h - 18h	
6h - 7h		18h - 19h	
7h - 8h		19h - 20h	
8h - 9h		20h - 21h	
9h - 10h		21h - 22h	
10h - 11h		22h - 23h	
11h - 12h		23h - 0h	
TOTAL			



SYSTEM MAX CAPACITY

Enter the hourly loads on the table shown. The total box at the bottom is the sum of your inputs. The System Max Capacity box shows what your solar system should be able to produce every day on average. It might be more in the summer and less in the winter but it allows you to have an idea of what your system might be able to deal with.

Once the curve has been set, just press OK and the BatMatch now runs on MANUAL ADJUSTMENT MODE.

How to use the optional Current Sensor

Go to SETTINGS>MODE>ADJUSTMENT>CURRENT_SENSOR

Make sure to use the Batsol Current Sensor as sized by the Batsol Team to fit your situation. The Current Sensor must be connected to the BatMatch as per the Current Sensor Manual. When you go for the Current Sensor Mode, you will be requested to enter some offset values for your sensor such as:

- Max AC current
- A/mV Sensor offset
- Single Phase / Three Phase operation
- ...

These values are provided with the Sensor. If they are missing, please check www.batsolpower.com for specifications of your sensor.

Once you have selected the Current Sensor Mode, the system will be driven in order to:

- Minimize grid consumption. As soon as a consumption is recorded at the Sensor level, the BatMatch gives to some micro inverters access to the energy stored in Batsols but just enough to bring back the grid consumption to zero.
- Minimize grid feeding. When excess solar energy is sent back to the grid, the BatMatch turns off some micro-inverters in order to store this energy instead of losing it.

This can of course only happen when the Batsol State of Charge allows it. It is the best option when you have a grid-tied home and you want to reduce as much as possible your grid consumption. The self-consumption rate, depending on your solar generator and number of Batsols, can easily reach more than 95%.

How to use the optional 0-10Vdc input

Go to **SETTINGS>MODE>ADJUSTMENT>A_INPUT**

The 0-10Vdc input allows you to drive the Batsols as you need from another Energy Management System (EMS). This is useful for complex sites or for sites involving other storage and energy generators. The 0-10Vdc signal acts as a throttle to define when energy should either be stored or used.

When selecting this mode, the BatMatch will drive the Batsols the same way it does for the Current Sensor but using the 0-10Vdc signal as the reference. 0-10Vdc scale is typically divided into two halves:

- 0Vdc-2.5Vdc when energy should be stored (0Vdc means all available solar power should be stored, no micro-inverter working. 2.5Vdc means no power should be either stored or drawn).
- 2.5Vdc - 5Vdc (5Vdc meaning that all energy stored in Batsols should be made available for micro-inverters).

The 0-10Vdc function has some limits. It does not instantly reacts as there is a minimum time loop for information to be processed to all Batsols and the micro-inverters will take a few seconds before connecting and producing after Batsol power has been made available to them.

Programmable Relay

The BatMatch has a programmable AUX Relay that can be used and set for many applications such as driving a deferrable load or shutting down a power source. In order to set this relay, go to:

Meters

From the METERS window, you can check the general data of your Batsols but also check each Batsol individually. The METERS also allow you to have an estimate of your self-consumption rate.

SETTINGS>AUX_RELAY>

The Relay action can be linked to the following input in **SETTINGS>AUX_RELAY>INPUT**

- SOC
- Grid Current direction
- Grid Current value
- Overall solar generator power output

Remote monitoring

A voir suivant le CdC BatWeb.

Warranty

The BatMatch® is guaranteed during 1 years after its production date against manufacturing defects or design flaws. Please check www.batsolpower.com for further details.