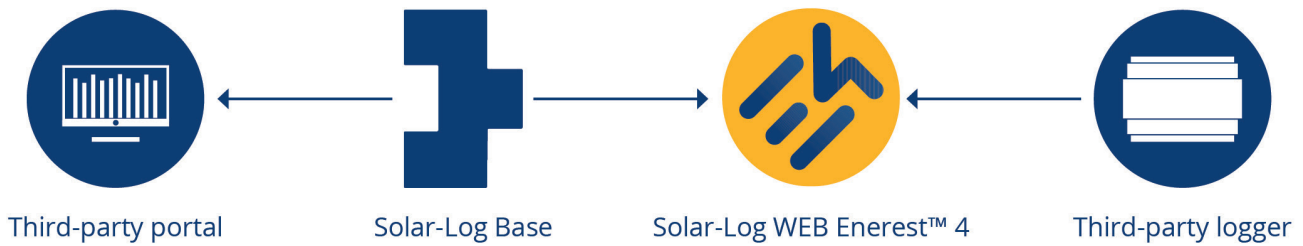


Monitoring systems: compare and contrast

The PV market offers numerous monitoring system solutions. From the all-rounder with data logger and software from a single source, to the pure software solution, everything is available to the plant operator. The greatest differences can be found in the flexibility of the functions. But with many hidden details, it is worth taking a close look to find the right system.



Compact solutions offer software and hardware from one manufacturer. With Solar-Log, software and hardware are also compatible with third-party systems from other manufacturers

What the market has to offer

There are currently around 50 different PV monitoring systems on the market. These can be divided into three categories of providers of data loggers and monitoring software, providers of pure monitoring software and monitoring software from inverter manufacturers.

The data logger is the core of the PV monitoring systems. It provides all the data from the PV system, which is then processed and output by the software.

In the case of providers of data loggers and monitoring software, so-called 'complete solutions', both components, i.e. hardware and software, are from one manufacturer. This has the great advantage that they are optimally matched to each other. In addition, PV monitoring is usually the core competence of these pure monitoring manufacturers, which enables them to provide the customer with a wide range of functions.

Providers of pure software solutions usually need a data logger from a third-party supplier. Here, a hurdle must be overcome right at the start; logger and software must

be compatible. In the case of new functions or extensions, there are sometimes time delays because the developments are carried out by two manufacturers.

In the third category, monitoring solutions directly from the inverter manufacturer, one saves the data logger, because here the data is transmitted directly from the inverter. However, with this solution, you are limited to one manufacturer and cannot simply switch to another manufacturer later or flexibly expand the system as needed, since the inverter is the central element.

What should a PV monitoring solution be able to do?

PV monitoring has long been more than just recording, reproducing and monitoring production data. When it comes to the scope of tasks for PV monitoring systems today, they must be able to do much more, including grid control, grid monitoring, direct marketing, energy management and own power utilization.

In addition to PV monitoring, the most important functions are own power use and feed-in management.

In-house power utilization means that the PV power is generated and used for in-house consumption. The monitoring system records the power consumption of the individual consumers and can thus contribute to the optimization of the self-power utilization. In some cases, it is already possible to control the consumers and storage units. For example, the battery storage is automatically charged when more of the company's own electricity is available than is being consumed.

Feed-in management occurs when the PV electricity is fed into the public grid in whole or in part. The monitoring system, which in this case is more of an energy management system, enables remote control of the PV system by the respective grid operator. In addition, the system records all data, including that of the regulation. If it is clear from the beginning that feed-in management is needed, it is recommended to choose a system that offers all components for this and regularly updates its system. This is because the market is very dynamic, especially in these areas, and constantly demands new functions.

The system owner should think carefully about how he wants to use his PV power. If in doubt, choose a solution that can be individually expanded.

How flexible are the various solutions?

A lot has happened in the PV market in recent years. In addition to complete solution providers, more and more providers of pure software solutions have arrived on the scene. Many suppliers of complete solutions have reacted by offering data loggers that are compatible with the software of other manufacturers.

Thus, the customer is free to choose the software solution and can change it as needed. However, one should pay attention to the contract terms here and take a close look at the respective functions. For example, direct marketing is usually not part of the service portfolio of the software solutions. And in the case of error analysis, you may also have to rely on the help of third parties, since this service does not have to be part of the portfolio. Another point is the contract terms; here it is worth taking a closer look, as the prices may seem low, but then you are tied in for a long time and have to pay monthly installments.



A system with numerous options to use the PV energy

Compared to software providers, complete solutions, data loggers and software from one manufacturer, offer a very flexible system. As a rule, the contract periods are very short, or you do not have to commit yourself at all. However, the individual cost points must also be looked at in detail here, since the different manufacturers also form different systems. Mostly the systems are aligned to the requirements of the different plant sizes.

A monitoring solution from a single source offers many interfaces and functions that are coordinated with each other. Thus one remains flexible also with possible extensions of the system.

The solutions of the inverter manufacturers are well coordinated, however, not very flexible. A change of manufacturer, or an extension still means the client is always bound to the inverter manufacturer.

Many suppliers offer independent data loggers that are compatible with various software solutions. Attention should always be paid to contract terms, conditions and functional scope.

How quickly can innovations be implemented?

In the case of so-called 'complete solutions', both the data logger and the software are optimally matched to each other. If, for example, the monitoring requirements are expanded, such changes are implemented at both interfaces in parallel. This means there are no delays for the plant operator. If an update is available, it works immediately and there is no need to wait for a second manufacturer to implement the update. In other words, the data logger supplies the necessary data or the software can process new data.

Pure software solutions are often at a disadvantage here. They are dependent on the data supplied by the hardware, or data logger, manufacturers. If the hardware provides new data, the software must first be adapted to it. In case of problems, e.g. after a firmware update, the user may experience long delays until the errors are corrected. With the solutions from the inverter manufacturers, one has everything from one manufacturer, as with the complete solutions. Here, new components only have to be purchased if required.

'Complete solutions' and the inverter solutions implement changes in parallel in the data logger and software. This means that there are no unnecessary delays.

What makes good support?

Good support is indispensable, especially for technical systems. This also applies to PV monitoring. So it is always important to see whether the manufacturer offers customer support. Then there are various characteristics by which you can identify a good support service. What are the hours? From when to when is the support available. How can the support be reached? Are there different options here? Is there on-site support?

Often the error patterns are not clear. The more complex the system, the more difficult it is to assign the error, i.e. whether it is in the software or in the hardware or arises when linking the two systems.

With two different providers, there is no way around having to talk to both support teams to find the cause. This takes time and can lead to a long troubleshooting process. The customer may act as a 'go-between' here, as the knowledge levels of the two companies may differ and communication is more difficult. This

inevitably results in long troubleshooting times and expenses for the customer.

With 'complete solutions' and the inverter solutions, there is support for data loggers and software. This often saves time and is easy on the nerves.

Where are the price differences?

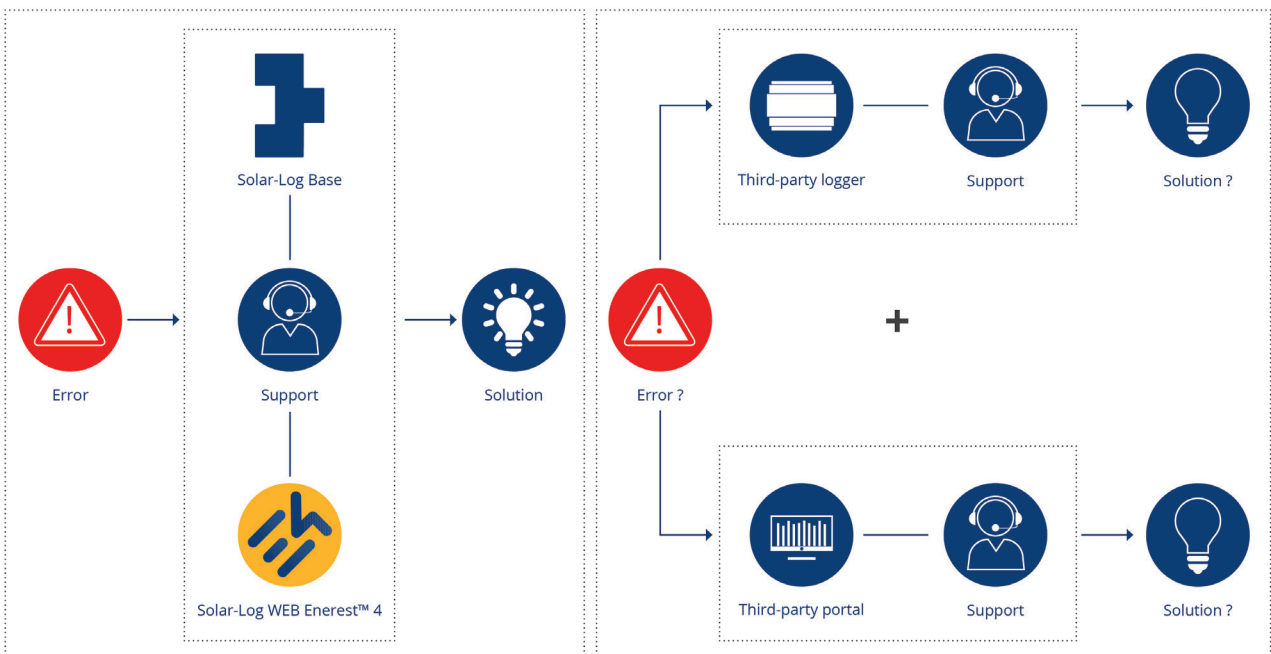
Now it gets complex. There are numerous different pricing models. At first glance, the web solutions are the cheaper option. However, the costs for the data logger are always added here. In addition, you often have to commit to the manufacturer for several years due to long terms.

The complete solutions, on the other hand, usually have a higher entry price. On the other hand, you are usually less contractually bound - thanks to short terms. The services also differ greatly from one another in some cases. You should think carefully about what you need, and if in doubt, choose a system that can be flexibly expanded. That way, you only pay for what you need and can expand the functions as needed.

You also have to consider the flexibility of the different providers' pricing models because the energy market is not static. New requirements for PV systems are added on a regular basis. Also change, for example, from self-consumption to direct marketing cannot be excluded. Therefore, it is important to make sure that one is flexible with the respective energy management system and can change if necessary, in order to profit from rising prices on the market.

Costs must be closely examined. Not everything that is cheap at first glance is cost effective in the long run.

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If hardware and software are from the same manufacturer, troubleshooting is usually easier and less time-consuming