

# Choosing the right charge controller for your off-grid application

PES caught up with Brad Berwald, Morningstar Product Manager, to learn all about their new product designed for domestic, rural use. Another company in our industry who is experiencing growth and positive global reception of its products with more to come.



Brad Berwald

**PES: We are pleased to welcome you back to PES Solar/PV. For the benefit of our new readers would you like to begin by explaining a little about the background of your organisation and how you currently serve the solar/PV industry?**

**Brad Berwald:** Morningstar is a US based company. Since 1993, we have been designing and supplying high quality solar charge controllers, to regulate battery charging in off-grid systems, throughout the world. This includes remote telecommunications, oil & gas, lighting, traffic, railroad, surveillance, residential, and many other applications where grid connectivity is not economically viable and solar power is the best solution.

Over the years, we've experienced steady growth and now we offer over 50 product SKU's including off-grid inverters and accessories that complement our solar charge controllers.

**PES: We have been reading about your EcoPulse™ solar charge controller, could you explain to us what it is and how it works?**

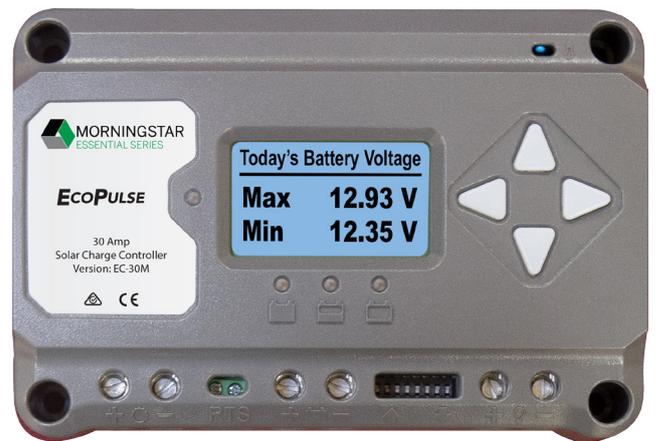
**BB:** The EcoPulse is our latest pulse width modulation (PWM) charge controller. It comes in 10, 20, and 30 amp metered and non-metered models to charge 12 or 24 volt battery systems. The device weighs less than half a kilogram and it is connected to

the solar array, the battery, and the load - which could be a light, radio, medical monitoring device, or something else that requires electrical power generally in the 100 to 800 Watt range.

During the day, the controller accepts power from the solar array and delivers it to the load. Any excess power is delivered to the batteries. The controller regulates the current and voltage delivered to the batteries so they can maintain a near full state of charge without getting overcharged.

Then during the evening, when there is no sunlight, the controller utilizes reserve battery power which it delivers to the load. The EcoPulse has an adjustable load control function so it can disconnect the load if the load draws too much battery power and drains the battery down to an unacceptable voltage limit.

In a nutshell, the EcoPulse maintains batteries at a high state of charge which increases battery life. The EcoPulse could represent 5% of your off-grid system costs whereas batteries could represent 40% of initial costs and as much as 80% of the lifetime costs of your system. Compared to other controller brands, the EcoPulse increases battery life and provides peace of mind for consumers, as they are sure their systems will deliver reliable power throughout the day and night for many, many years.



**PES:** What sort of installations is it suitable for – domestic, industrial etc?

**BB:** The EcoPulse was clearly designed for residential, rural electrification, boating and RV-caravan consumer applications outside of the US and Canada.

In addition to adjustable charge and load control settings, the controller has dusk 'til dawn lighting control. It also has environmental and electronic protections and complies with IEC 62109 standards.

**PES:** What motivated Morningstar to develop such a product?

**BB:** Ah, this is a very interesting question. For almost 25 years Morningstar has developed a strong reputation for supplying industrial strength, high quality, reliable charge controllers with innovative features for remote telecommunications, oil & gas, traffic and other industrial/commercial sites.

However, a fair amount of residential and leisure consumers were also attracted to our products because of Morningstar's quality and reliability, but not necessarily because of the innovative features and industrial specs.

This market segment also needed a lower price point. Hence we decided to make a new product that focused primarily on reliable, quality battery charging without communications capabilities, data logging,

hazard class certifications, and other embellishments that are highly sought after in professional/industrial projects.

**PES:** What are the advantages of this system to the end user and is it cost effective?

**BB:** The biggest advantage is that the EcoPulse has a much lower price point than other Morningstar controllers with comparable charge ratings. The EcoPulse has reliable control capabilities, but by omitting some industrial features we were able to save on design, manufacturing, and certification costs.

Additionally, this product requires less technical support resources, because there are no communications and data issues involved that might require education and training for distributors and end-users. But we kept the features that consumer end-users like.

For example, one really cool feature, preferred by consumer end-users, is the interactive multi-lingual display on the metered versions of the EcoPulse. The large font and backlit meter are very easy to read and the meter display scroll buttons allow for quick charge and load control adjustments and activation or deactivation of lighting control. These adjustments can be made in the field in a matter of seconds without any tools.

**PES:** Do you plan to make other competitively priced controllers for non-industrial consumers that are primarily focusing on reliability and cost, rather than extra features?

**BB:** Yes, we are already designing MPPT controllers for consumer applications that will be more competitively priced than our comparably rated professional/industrial controllers. The EcoPulse and other consumer targeted controllers will be created and placed into our newly created Essential Series™ of products.

As the name implies, this Product Series includes controllers that are for consumer and leisure markets where essential charging functionality is the primary concern. Our industrial strength controllers that include communications, data logging and additional certifications have been moved into our newly created Professional Series™.

**PES:** How easy is it to use and is specific training needed to use it, if so how long and where is the training done?

**BB:** The EcoPulse is very easy to use. Customers say you can set it and forget it. Our detailed operation manual contains pictures and step by step guides in English, Spanish, French and German concerning implementation and usage.

People that are new to off-grid solar will be able to use this controller pretty easily.

*‘For many years we have been designing products that get used on every major continent throughout the world and we will continue to do so.’*

No training or prerequisites are required to use and deploy this controller.

**PES:** Can you tell us more about your Professional Series controllers?

**BB:** The charge controllers within our Professional Series have helped regulate power for commercial lighting and surveillance; repeaters at telecommunications sites, and process control, cathodic protection and SCADA equipment at oil and gas sites.

Many of these sites are difficult and costly to access if a controller needs to be serviced or replaced, so only the highest quality controllers are considered for deployment. These professional/industrial sites oftentimes require controllers that meet specific noise, communications and hazard class ratings. Morningstar has been tried and tested to meet these requirements for several decades.

**PES:** What makes Morningstar stand out from the competition and how do you intend to stay one step ahead?

**BB:** First and foremost, we’ve had a long and consistent track record for supplying high quality, reliable charge controllers. Since our beginnings, a lot of companies in the solar industry have come and gone, or have experienced high turnover due to mergers or other factors.

Morningstar, however, has maintained the same ownership since the very beginning and many of our employees have been with the company for ten years or more.

Secondly, we devote sufficient resources towards research and development so we can keep designing innovative products to improve the customer experience and solve new challenges.



Off-grid rural electrification projects in developing countries

**PES:** Do you have any other projects on the horizon?

**BB:** We have some large off-grid rural electrification projects in developing countries for which we are starting to supply controllers. Before the end of this year, we plan to launch a cloud based site manager that will allow installers to see PV array, battery and load metrics for all of their off-grid systems.

But the biggest project we are working on involves the introduction of a new off-grid inverter charger in the first half of 2018 and we will be featuring at Solar Power International this September.

The off-grid inverter project is very exciting, because it can serve a huge market. Presently, our small SureSine inverter has been a popular product because of its rugged design ability to supply high quality reliable AC power. Our new off-grid inverter charger provides us with a great opportunity to win new customers who are looking for Morningstar quality in the 4 to 5 kW range.

**PES:** Speaking from a global standpoint, which geographical regions do you

anticipate being key for Morningstar as we move to the end of 2017?

**BB:** For many years we have been designing products that get used on every major continent throughout the world and we will continue to do so.

Rural electrification projects in Africa and South America will definitely be a major focus for us. Australia-New Zealand will also be key for us because our new EcoPulse controller meets requirements for boating and RV-caravan applications in that region.

**PES:** Has 2017 been a good year so far for Morningstar and how are things looking for the end of the year?

**BB:** 2017 has been a good year. We launched the third generation of our ProStar PWM controller early in the year. It has many advanced features compared to the old ProStar and we made no sacrifices to quality and reliability. With the new EcoPulse and the new web service that we will roll out soon, we plan to have a very strong second half of the year.

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