

# Introducing Morningstar's New TriStar MPPT 600V Charge Controller with DC Transfer Switch



For retrofitting existing grid-tied solar installations with battery backup power

***This new version of the TriStar MPPT 600V controller includes:***

- PV disconnect/Transfer switch
- Grid-tie inverter terminals
- All the features associated with previous versions including
  - Peak efficiency of 97.9%
  - Pre-set for 48 Vdc battery systems
  - Full I-V curve sweep in < quarter of a second
  - Parallel operation of multiple controllers from a single source input
  - Extensive networking and communications capabilities



Don't let your PV array go to waste.

*It's Time for the Switch!*



*"Morningstar's DC Coupled backup solution for grid-tied solar systems is a game changer. Now people can use the PV array that they already paid for to create backup power when the grid goes down. This simple, clean, scalable approach has many advantages over AC coupling and other solutions." – Sequoia Cross, CEO, Backwoods Solar*

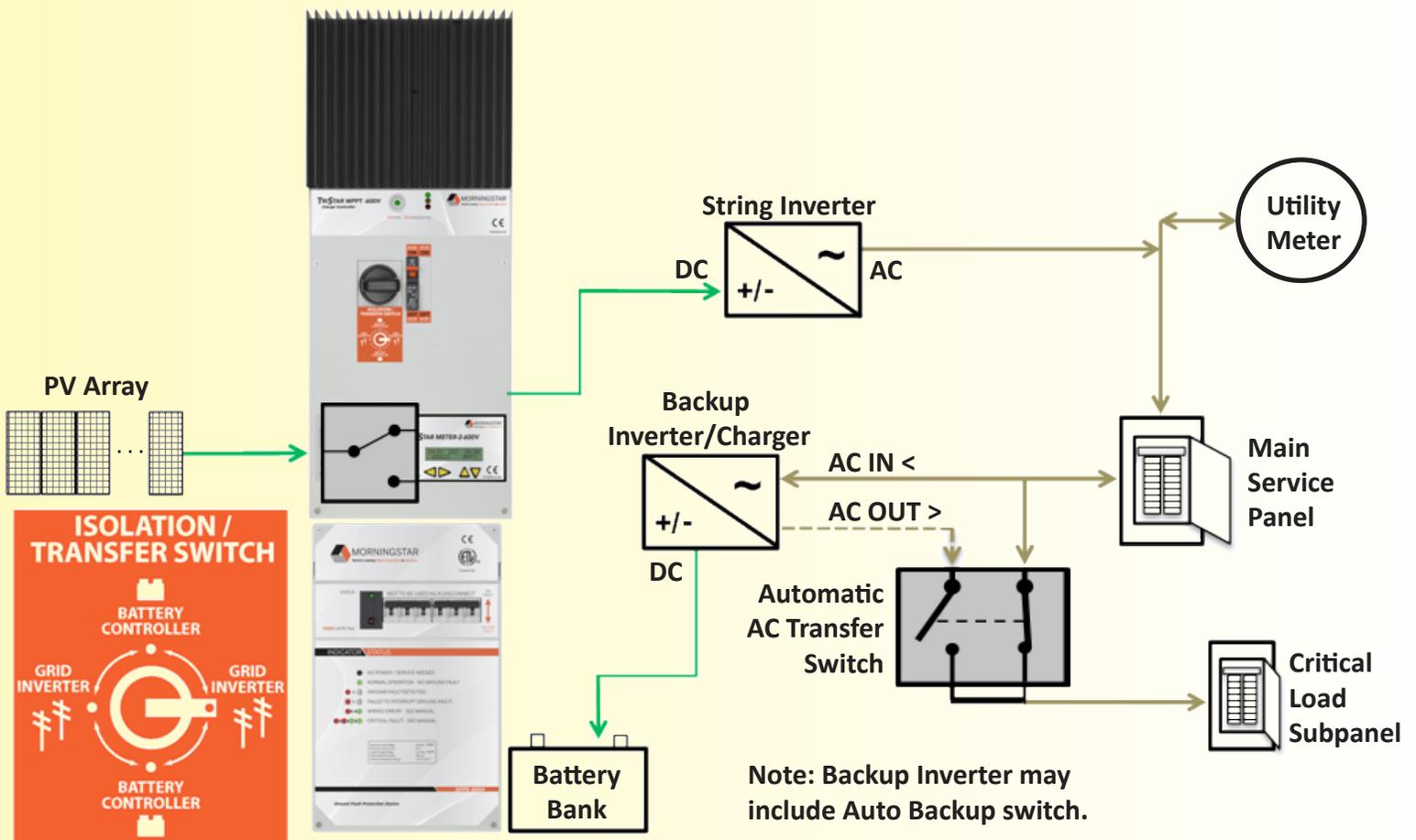


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# HOW IT WORKS:

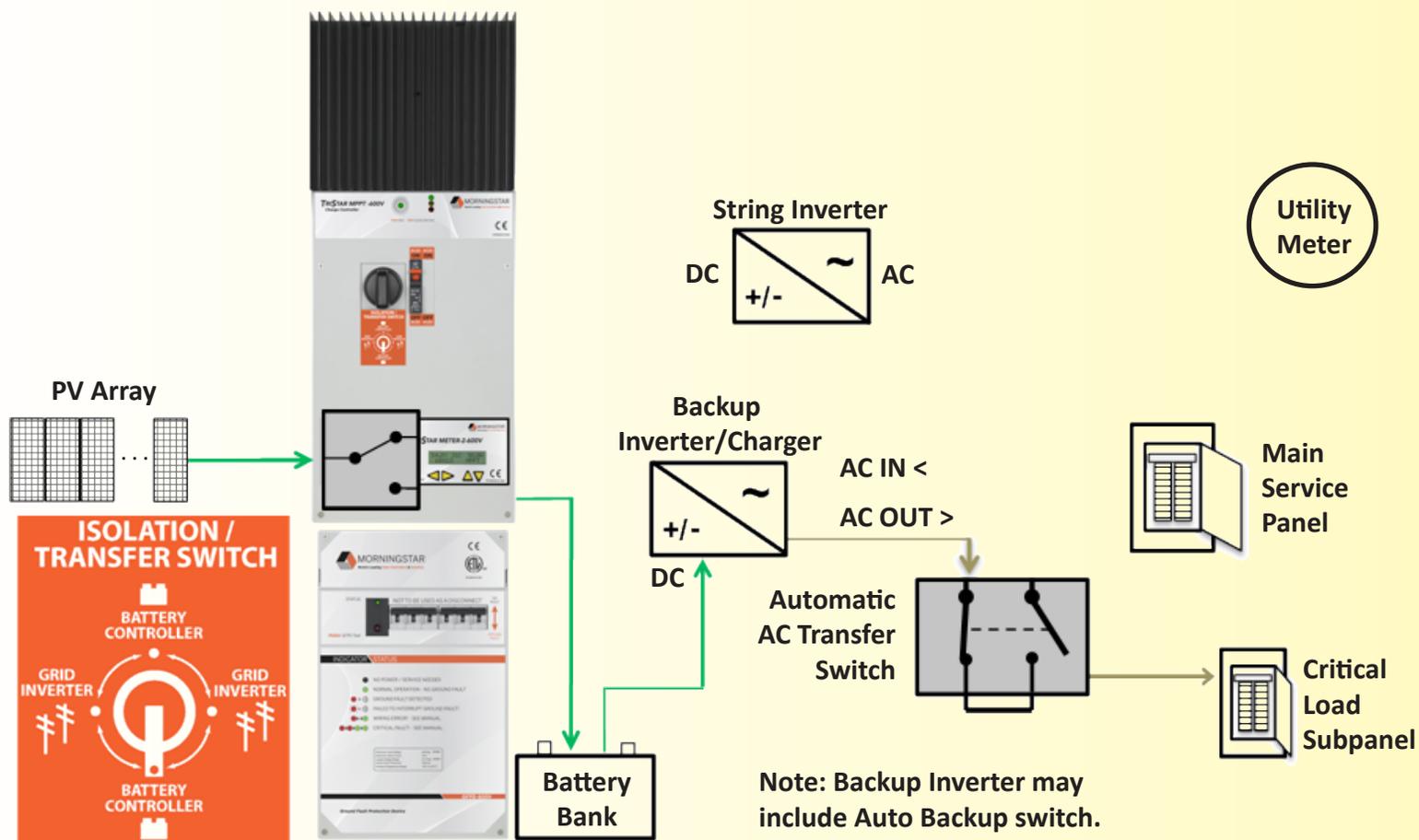
## During Grid-Tied Operation: PV array is connected to the string inverter



The diagram above illustrates an example of a grid-tied solar system that has been retrofitted to include the TriStar MPPT 600V Controller with DC Transfer Switch, a ground fault protection device, batteries, and a backup inverter/charger to enable battery backup in the event of a grid failure. As long as the grid is up and operating normally, the controller's PV transfer switch is maintained in the Grid ON/controller OFF position to direct electricity flow to accommodate net metering in a typical grid-tied system. DC power from the solar array does not get regulated by the controller while its switch is in the Grid ON/controller OFF position. Instead, the controller's switch directs power to the string inverter, which creates and channels AC power to the main service panel. Any excess power is delivered to the utility company for a credit. The power delivered to the main service panel flows to the critical load sub-panel, and also to the backup inverter/charger which converts AC power to DC power to charge the battery bank. This enables a ready supply of backup power when a grid outage occurs.

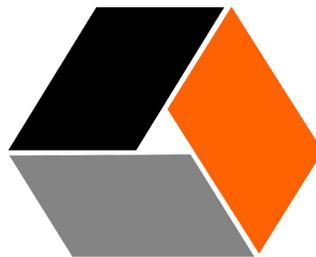
# HOW IT WORKS:

## During Battery Backup Operation: TriStar MPPT 600V is connected to the PV array



2nd parallel input TS-MPPT600V controller  
can increase the charging capacity.

During a grid outage, batteries instantly supply power to critical loads. The PV disconnect transfer switch on the 600V controller is then turned to the Battery Backup/Controller ON position. With the switch in this position, the DC power flows through the controller and to the batteries to charge the batteries. The batteries send DC power to the inverter/charger, which converts the DC to AC power, and the automatic AC transfer switch inside the backup inverter charger directs the power to the critical load sub-panel so that critical loads can be run, such as your refrigerator, lights, computer, sump pump, and cell phone charging outlet. So during a grid outage, you have emergency power from your batteries that get charged from the PV array. Then when the grid power is restored, the controller's PV transfer switch is turned back to the original Grid On/Controller OFF position so electricity resumes flow in a typical grid-tied system path.



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