Remote-Start Generator for GreenFeed

The optional remote-start generator will allow GreenFeed to charge itself even if there is no access to line power. This is achieved using a gasoline-powered generator to charge the batteries when the voltage gets low.

GreenFeed can be configured to automatically turn on the remote-start generator using the following options, which are found in the Feeders->Configure page:

Hours to monitor battery level:	00,01,02,03,04,05,06,07,
Battery level out-of-range delay:	600
Power save battery level:	10
Emergency battery level:	9.902
Generator minimum battery level:	11.099
Generator maximum battery level:	14.499
Generator minimum run time:	180
Generator maximum run time:	3600
Generator minimum ignition startup attempt time:	1
Generator maximum ignition startup attempt time:	7
Generator startup - battery check delay:	60
Ensure battery voltage rises this much:	0.601
Once turned off, leave generator off for this many seconds:	900

1) Generator minimum battery level – When the batteries get to or below this voltage level, GreenFeed will automatically try to turn on the generator. Depending on the number of batteries and type of battery used, this value should be somewhere between 10 and 12 volts.

2) Generator maximum battery level – If GreenFeed was successful in starting the generator it will charge the batteries until the voltage reaches this level or higher. Depending on the number of batteries and type of battery used, this value should be somewhere between 13.5 and 15.5 volts.

3) Generator minimum run time – Once GreenFeed has successfully started the generator, the generator will run for **at least** this long (in seconds), even if the voltage level is above the maximum battery level.

4) Generator maximum run time – Once GreenFeed has successfully started the generator, the generator will run for **at most** this long (in seconds), even if the voltage level does not reach the maximum battery level. The default value of 3600

seconds (1 hour) will prevent the generator from running for too long, in case the battery charger is not working correctly.

*** The combination of items 2, 3, and 4 determine how long the generator will run, once it is automatically started. ***

5) Generator minimum/maximum ignition startup attempt time – Under ideal conditions, the generator will start up immediately, but in sub-optimal conditions (such as cold weather or after a long period of off-time), the generator start process must be allowed to run for a few seconds. Just as a car ignition key may need to be held for a few seconds for the engine to "turn over". GreenFeed will first attempt to start the generator for only 1 second. If the generator fails to start, GreenFeed will attempt to start it for 3 seconds. If the generator still fails to start, GreenFeed will attempt to start it for 5 seconds. It will repeat this process until it reaches the "maximum ignition startup attempt time" (in seconds). If the generator still does not start after reaching this length of time, it will send an email alert stating that it cannot start the generator. The default is to start the time at 1 second and end after 7 seconds which allows for up to four different attempts to start the generator.

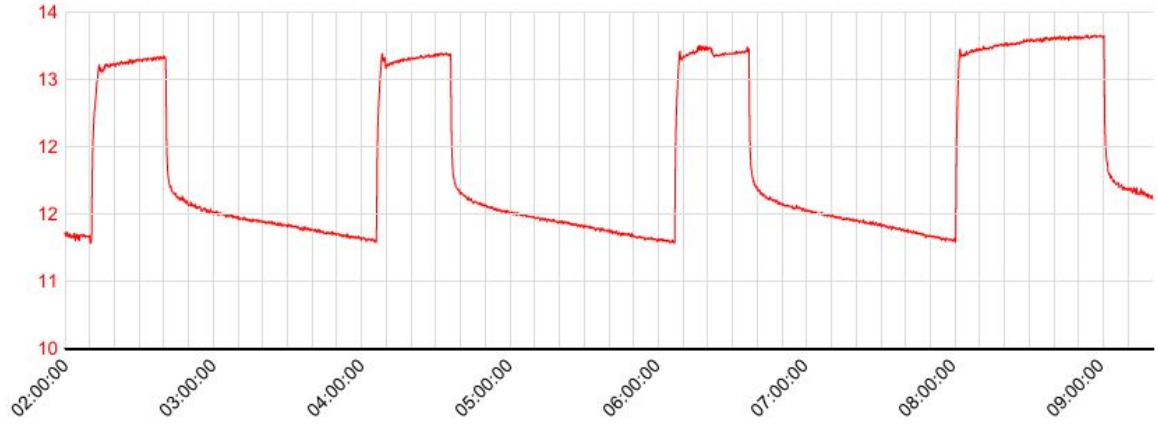
6) Generator startup - battery check delay – To determine if the generator has started correctly, GreenFeed monitors the battery voltage before and after it attempts to start the generator. If the voltage level increases during this time, then the generator started successfully. The duration between starting the generator and when to check for a voltage change is configured with this option. Generally, the default of 15 seconds is a good value.

7) Ensure raw battery voltage rises this much – The voltage increase mentioned in item 6 is configured by this option. For most batteries, the voltage should increase at least 0.2 volts once they are connected to a charger; this is the default value.

*** The combination of items 6 and 7 are used by GreenFeed to determine if the generator is actually starting up or not ***

8) Once turned off, leave generator off for this many seconds – To avoid the generator constantly turning on and off, a "cooldown" time can be set. Once the generator is automatically turned off, it will not be allowed to automatically turn on for this many seconds.

Below is a common battery voltage + generator cycle from a GreenFeed unit:



Each rise is caused when the generator turns on, then when the generator turns off, the voltage slowly drops until the generator turns on again.