



## App Note 133

### UPB and Emergency Generator Use

If a UPB installation is receiving power from a backup or emergency generator, probably one of the last things on your mind is how well your automation is working. However, with extensive UPB installations it may be the only way to control some lighting if UPB keypads are used to transit signals to load controllers installed elsewhere.

The UPB power line communication method consists of transmitting digitally encoded information over the electrical power line as a series of precisely timed electrical pulses that are superimposed on top of the normal 60HZ AC power waveform.

When power is received from the normal sources – the electric company – great care is taken by that service to maintain the frequency as close to 60hz as possible. Rarely deviates more than .1%. All of USA, Canada, and Mexico are synchronized exactly. You can look up the exact frequency on the internet for the North American continent at any time. While the intent of a mechanical or electronic backup generator is also to deliver power at 60hz sometimes it can vary significantly from that. Easily drift +/- several %.

Because of the precisely timed nature of the UPB signals as described above, a powerline frequency that is faster than 60hz, say 61 or 62 hz will affect UPB signals. During the design of the UPB protocol and the implementation of it in your UPB devices, the engineers attempted to allow for a line frequency that is not exactly at 60hz. The good news is that this was possible for frequencies close to 60hz but less than that. For example, a line frequency of 57, 58 or 59 hz will allow UPB signaling to operate normally. Unfortunately, it was not possible to allow for line frequencies over 60hz. The microprocessor code will run out of time at the end of the ½ cycle and miss the next zero crossing point. If the line frequency is over 61hz then UPB communication will fail, plus existing UPB triac based dimmers will miss ½ cycles when turned on and will appear to flicker. Relay devices such as the WS1R will not flicker.

The only way to insure proper UPB operation is to set the generator speed to below 60 hz. The freq must stay below 60 hz at all load conditions. All generators speed up when the load decreases and slow down when the load increases.

If you are using a backup generator, it may be possible to adjust the frequency lower so that you don't experience communication or dimmer flicker problems. Please consult any owners' manuals or discuss the problem with an electrician who specializes in backup generator systems.

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19201 Parthenia St. Suite J  
Northridge, CA 91324  
P: 818.701.9831 F: 818.701.1506  
pcssales@pcslighting.com  
www.pcslighting.com