Minutes of teleconference meeting of the IEEE P1789
Date: 3/25/09
Start time: 12.00 PM
End time: 1:00 PM

Attendees:
Anindita Bhattacharya, Kevin Dowling, Jianzhong Jiao, Faisal Khan, Brad Lehman, John Halliwell, Conor Quinn, Anatoly Shteynberg

1. The agenda and the last meeting minutes were presented. Prior to the January meeting minutes being entered into the record there was discussion about whether the scope of the group should be included on the minutes. The officers agreed that they would do this in the future but asked that the existing minutes be accepted without this requirement. This was agreed to and the minutes were entered without any objection.
2. Brad Lehman presented the LinkedIn discussion summary and reminded members that technical reference material is posted on the IEEE private posting board (not LinkedIn web site) at http://grouper.ieee.org/groups/1789/ and then clicking on the members only link. In the web discussion, there seemed to be uniform consensus that modulating LEDs above 5.5kHz has no known health visual health risks. This was based on the summary research table with references provided by Prof. Wilkins, as well as the web technical discussion among committee members. (NOTE: see discussion on Audio issue of this below.) Other web discussions were ongoing to assure that the PAR1789 standards group communicates well with other related standard groups in lighting. There is interest from IEEE P802.15.7, which is developing a specification for data communication through blinking LEDs to learn more about our findings.
3. A summary of officer activities, publicity outreach, and membership expansion was given. The officers met with IEEE Power Electronics Standards Chair at the IEEE Applied Power Electronics Conference in Washington DC. A report was given on this meeting and the emphasis to make sure PAR1789 recommendations do not inhibit technical innovation. Flyers and announcements were handed out at the conference, which includes many LED IC driver manufacturers. Other members also announced the various workshops and conferences in which they included presentations of IEEE PAR1789 activities. Similarly, there will be an EDN blog on activities and there has been email sent to members of the LED Professionals LinkedIn group http://www.linkedin.com/groups?gid=779517 that has hundreds of members. Membership is growing, and a list of memberscan be found on our LinkedIn group page. An emphasis on including all stakeholders in the process was mentioned.
4. The frequency of modulating LEDs above 5.5kHz was discussed. The 5.5kHz is in a sensitive audio frequency range, but above this frequency produces minimal flicker related visual effects to a viewer. The range of audio frequency is commonly listed between 20Hz and 20kHz. It was agreed upon that we would enter into the minutes and in any future web site postings that frequencies above 5.5kHz did not seem to have adverse visual health effects but that there may exist audio effects. Further, this is a conservative frequency, and PAR 1789 plans to discuss lower frequency limits in the future. This is a starting point for Par1789 discussions and is not an official statement by our group: It is simply an update on the progress and working status of our efforts as of today. Further, it was mentioned that for some applications in lighting, there may even be specific frequency ranges that have health benefits. All this is to be considered within the scope of PAR 1789 activities.

5. John Halliwell talked about the various lighting products tested at EPRI. He also talked briefly about the high brightness LEDs and mentioned that sometimes lamps use multiple lower brightness LEDs. He mentioned the presence of 120 Hz ripple in street lighting which is possibly caused by the PFC circuit used in those lamps. This varied from anywhere to 5% to 30% ripple. He also talked about the tested modulation frequency of various LED lighting products.
6. A strategy for how our group should proceed was discussed. It was decide that we will first focus our efforts on examining health effects of flicker in LED lighting. Once we understand and write detailed summaries of the various health effects of the flicker, then we will associate risks and any recommended practices.
7. Action Item 1: Kevin Dowling agreed to start a technical discussion to help lead the group on health effects of aspects of flicker. The group was reminded; also, it was their responsibility to read the existing material posted on the private pages and in the LinkedIn discussion boards on this topic.
8. Faisal Khan asked members (again) for suggestions regarding future telecon meeting topics. The plan is to have the next few meeting discussion topics prepared in advance. We will have a member or an outside expert lead a discussion on a topic of interest for a major portion of the meeting. Members should email Faisal Khan with suggestions of topic.
9. Meeting was adjourned.

IEEE Approved Scope of PAR1789 (any modifications must be approved by the IEEE Standards Board of Governors)

The scope of this standard is to: 1) Define the concept of modulation frequencies for LEDs and give discussion on their applications to LED lighting, 2) Describe LED lighting applications in which modulation frequencies pose possible health risks to users, 3) Discuss the concept of dimming of LEDs by modulating the frequency of driving currents/voltage 4) Present recommendations for modulation frequencies for LED lighting and dimming applications to protect against known adverse health effects.