

# Minutes

## Control Protocols Working Group

Thursday, 18 October 2012  
The Las Vegas Hotel  
Las Vegas, NV

**Presiding chairman:** Michael Lay; Philips Color Kinetics (Royal Philips Electronics); P; MP

**Recording secretary:** Karl G. Ruling; PLASA

### Members attending:

Jean-Francois Canuel; Spectrum Manufacturing Inc. (A.C. Lighting Ltd.); P; CP  
Kevin Loewen; Pathway Connectivity Inc. (Acuity Brands Inc.); P; MP  
Simon Hobday; Artistic Licence Engineering Ltd. (Alderamin Group); P; DE  
Bill Ellis; Candela Controls, Inc.; O; U  
Larry Dunn; City Theatrical, Inc.; A; MP  
Edward A. (Ted) Paget; Daktronics Automated Rigging Solutions (Daktronics Inc.); P; G  
Larry Schoeneman; DesignLab Chicago, Inc.; P; DR  
Milton Davis; Doug Fleenor Design, Inc.; A; MP  
Sean Sill; Doug Fleenor Design, Inc.; A; MP  
Maya Nigrosh; Electronic Theatre Controls, Inc.; A; MP  
Sang-Kyu Lim; Electronics and Telecommunications Research Institute; P; G  
Insu Kim; Electronics and Telecommunications Research Institute; A; G  
Eric Johnson; O; G  
Scott M. Blair; Full Throttle Films/ VER; P; DR  
Robert Goddard; Goddard Design Co.; P; MP  
Ed Garstkiewicz; Harting Inc., North America (Harting KGAA); P; G  
Peter Willis; Howard Eaton Lighting Ltd.; P; CP  
Roger Lattin; I.A.T.S.E. Local 728; P; U  
Hamish Dumbreck; JESE Ltd.; (James Embedded Systems Engineering); P; MP  
John Musarra; O; U  
Ken Vannice; Leviton Manufacturing Co., Inc.; P; MP (arrived at 10:00)  
Tyrone Mellon\_Jr.; Lex Products Corp.; P; CP  
Peter Kirkup; Lumen Radio AB; A; MP  
Hans Lau; LumenRadio AB; A; MP  
Charles Reese; Production Resource Group; P; DR  
Simon Newton; I; G  
Mitch Hefter; USITT; P; U  
Christopher Tilton; Westlake Reed Leskosky; P; DE

No visitors.

### 1 Opening remarks

Michael Lay called the meeting to order at 9:03.

### 2 Attendance

#### 2.1 Introductions of those present and circulation of attendance sheet

A bright orange sign-in sheet was circulated while those present introduced themselves.

#### 2.2 Determination of a quorum

Michael Lay asked for a show of hands of voting members. He counted them and then announced that a quorum was present and business could be conducted.

#### 2.3 Recognition of alternate voting members

### 3 Membership

#### 3.1 Requirements for membership

Michael Lay read the following statement aloud to the assembly:

Membership is open to all who are affected by the work of the group. People and companies that would be in any interest category other than a manufacturer interest category are at this time particularly encouraged to apply for membership. Voting members are required to attend meetings and to vote on letter ballots. Voting members and their alternates may not miss three consecutive meetings without a loss of voting status.

#### 3.2 Changes to observer status due to lack of attendance

Voting members who have missed the previous two meetings and will be moved to observer status if this meeting also is missed:

Peter Kirkup; Cooper Controls Ltd.; MP  
Peter Willis; Howard Eaton Lighting Ltd.; CP  
Charles Reese; Production Resource Group; DR  
Mitch Hefter; USITT; U  
Christopher Tilton; Westlake Reed Leskosky; DE

All were present, but Kirkup had applied to change his company representation. (See 3.3.)

#### 3.3 Processing of new membership requests and reaffirmation of members with new companies

As of Thursday 27 September, the following applications had been received and logged:

Eric N. Johnson, representing himself; Observer; General interest  
Matthew Ardine; IATSE Local 728; Observer; User  
Perter Kirkup; LumenRadio; Alternate; MP

Simon Hobday asked to be moved from observer to principal voting member for Artistic Licence, with Wayne Howell as alternate.

Hamish Dumbrek asked to be moved from observer to principal voting member for James Embedded Systems Engineering.

Ted Paget moved that the membership requests be accepted. The motion was seconded and then approved with a show of hands

#### 3.4 Consensus body

The complete consensus body during the period of this meeting was:

Name	Representing	Voting status	Int. cat.
Jean-Francois Canuel	A.C. Lighting Ltd.	P	CP
Reza Khanmalek	A.C. Lighting Ltd.	A	CP
Kevin Loewen	Acuity Brands Inc.	P	MP
Robert Bell	Acuity Brands Inc.	A	MP
Gary Douglas	Acuity Brands Inc.	A	MP
Alan Martello	Acuity Brands Inc.	A	MP
Philip Nye	Acuity Brands Inc.	A	MP
Garrett Gallant	Acuity Brands Inc.	A	MP
Simon Hobday	Alderamin Group	P	DE
Wayne David Howell	Alderamin Group	A	DE
Paul Kleissler	City Theatrical, Inc.	P	MP
Larry Dunn	City Theatrical, Inc.	A	MP

Name	Representing	Voting status	Int. cat.
Edward A. (Ted) Paget	Daktronics Inc.	P	G
Larry Schoeneman	DesignLab Chicago, Inc.	P	DR
Ulrich Kunkel	DIN, NVBF Committee	P	U
Doug Fleenor	Doug Fleenor Design, Inc.	P	MP
Milton Davis	Doug Fleenor Design, Inc.	A	MP
Sean Sill	Doug Fleenor Design, Inc.	A	MP
Daniel W. Antonuk	Electronic Theatre Controls, Inc.	P	MP
Steve Terry	Electronic Theatre Controls, Inc.	A	MP
Maya Nigrosh	Electronic Theatre Controls, Inc.	A	MP
Sang-Kyu Lim	Electronics and Telecommunications Research Institute	P	G
Insu Kim	Electronics and Telecommunications Research Institute	A	G
Scott M. Blair	Full Throttle Films/ VER	P	DR
Robert Goddard	Goddard Design Co.	P	MP
Ed Garstkiewicz	Harting KGAA	P	G
Howard Forryan	Harting KGAA	A	G
Peter Willis	Howard Eaton Lighting Ltd.	P	CP
Edwin S. Kramer	I.A.T.S.E. Local 1	P	U
John Huntington	I.A.T.S.E. Local 1	A	U
Roger Lattin	I.A.T.S.E. Local 728	P	U
Dennis Grow	I.A.T.S.E. Local 728	A	U
Alan M. Rowe	I.A.T.S.E. Local 728	A	U
Hamish Dumbreck	James Embedded Systems Engineering	P	MP
Ken Vannice	Leviton Manufacturing Co., Inc.	P	MP
Tyrone Mellon_Jr.	Lex Products Corp.	P	CP
Joshua Liposky	Lex Products Corp.	A	CP
Peter Kirkup	Lumen Radio AB	A	MP
Michael Karlsson	LumenRadio AB	P	MP
Marcus Bengtsson	LumenRadio AB	A	MP
Hans Lau	LumenRadio AB	A	MP
Ron Bonner	PLASA EU	P	G
Charles Reese	Production Resource Group	P	DR
Michael Lay	Royal Philips Electronics	P	MP
Kimberly Corbett	Schuler Shook	P	DE
Simon Newton	Simon Newton	I	G
Mitch Hefter	USITT	P	U
Christopher Tilton	Westlake Reed Leskosky	P	DE
	<b>Total possible</b>	<b>27</b>	
	<b>Subtotals by interest categories</b>	<b>3</b>	<b>CP</b>

Name	Representing	Voting status	Int. cat.
		9	MP
		3	DE
		3	DR
		4	U
		5	G

#### 4 Approval of the minutes from the July meeting

See *CPmin07-2012.pdf*

Scott Blair moved that the draft minutes be accepted. The motion was seconded and then approved with a show of hands.

#### 5 Reading of the call for patents

Michael Lay read the following statement aloud to the assembly:

"PLASA intends not to publish any standard that contains protected intellectual property, unless that information can be licensed by anyone for a reasonable fee. PLASA uses a process of open patent and copyright disclosures to implement its intent. PLASA does not conduct patent or copyright searches and does not warrant that its standards contain no protected intellectual property.

"In keeping with the open disclosures policy, I ask if anyone present wishes to notify this working group of the existence of a patent or copyright or other intellectual property that might protect material in a standard being developed by this working group. You need not be the holder of the patent or copyright to notify this working group of its existence."

Nothing was reported.

#### 6 Reading of the anti-trust statement

Michael Lay read the following statement aloud to the assembly:

"The PLASA Board of Directors, the Technical Standards Council, and the leadership of this working group will reject or nullify any actions that unlawfully restrain trade. Anyone who feels that such an action is being or has been taken is requested to bring that matter to the attention of the chairs immediately. Anyone who feels that actions in restraint of trade have been taken and not properly annulled is requested to notify the TSC chair or PLASA chair immediately.

"PLASA legal counsel has informed us that violations of the anti-trust laws can have serious consequences. Individuals engaged in certain unlawful conduct can be found criminally liable. An individual convicted of a criminal violation of the Sherman Act may be fined as much as \$1,000,000 and imprisoned for up to ten years. An easy to read pamphlet describing restraint of trade issues is available from the Technical Standards Manager."

The TSM held up some of the easy-to-read pamphlets to show their availability at the meeting.

No restraint of trade problems were reported.

#### 7 Approval of agenda

The following items were added to the agenda:

8.7.4 PLASA show report

8.7.5 PLASA Focus at Stamford

8.7.7 RDM responder testing results

9.2 A standardized approach for making RDM monitoring networks.

9.3 RDM compliance testing

9.4 RDM six years on.

9.5 Task group meeting scribes.

9.6 CPWG structure and voting membership: observation and comments

Mitch Hefter moved that the amended agenda be approved. The motion was seconded. The motion was accepted with a show of hands

## **8 Old business**

### **8.1 Standards Maintenance. Any news or action needed on any of these standards? This is a placeholder in the agenda, so we don't forget to maintain them.**

ANSI E1.3 – 2001 (R2011), Entertainment Technology - Lighting Control Systems - 0 to 10V Analog Control Specification & Application Guide For ANSI E1.3 – 2004 Lighting Control Systems 0 to 10V Analog Control Specifications. Revision, reaffirmation or withdrawal in 2016.

ANSI E1.11 – 2008, Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories. Revision, reaffirmation, or withdrawal in 2013. (*See New business*)

ANSI E1.17 - 2010, Architecture for Control Networks. Revision, reaffirmation or withdrawal in 2016.

ANSI E1.20 - 2010, Remote Device Management over USITT DMX512. Revision, reaffirmation or withdrawal in 2016.

ANSI E1.27-1 – 2006 (R2011), Entertainment Technology - Standard for Portable Control Cables for Use with USITT DMX512/1990 and E1.11 (DMX512-A) Products. Revision, reaffirmation or withdrawal in 2016.

ANSI E1.27-2 – 2009, Entertainment Technology - Recommended Practice for Permanently Installed Control Cables for Use with ANSI E1.11 (DMX512-A) and USITT DMX512/1990 Products. Revision, reaffirmation, or withdrawal in 2014.

ANSI E1.30-1 - 2010, EPI 23, Device Identification Subdevice. Revision, reaffirmation or withdrawal in 2016.

ANSI E1.30-3 – 2009, EPI 25, Time Reference in ACN Systems Using SNTP and NTP. Revision, reaffirmation, or withdrawal in 2014.

ANSI E1.30-4 – 2010, EPI 26, Device Description Language (DDL) Extensions for DMX512 and E1.31 Devices. Revision, reaffirmation, or withdrawal in 2015.

ANSI E1.30-7 – 2009, EPI 29, Allocation of Internet Protocol Version 4 Addresses to ACN Hosts. Revision, reaffirmation, or withdrawal in 2014.

ANSI E1.30-10 – 2009, EPI 32, Identification of Draft Device Description Language Modules. Revision, reaffirmation, or withdrawal in 2014.

ANSI E1.31 – 2009, Entertainment Technology – Lightweight streaming protocol for transport of DMX512 using ACN. Revision, reaffirmation or withdrawal in 2014.

ANSI E1.37-1 - 2012, Additional Message Sets for ANSI E1.20, Remote Device Management

### **8.2 BSR E1.30-12, EPI 34, E1.31 Universe Synchronization**

*Progress report from the Task Group headed by Ulrich Kunkel.*

Ulrich Kunkel was not present. Karl Ruling read Kunkel's emailed report to the assembly:

Unfortunately I had to cancel my visit to the Las Vegas meeting as a larger project's commissioning doesn't allow me to join you this time.

For the subject of E1.30-12 EPI 34 Universe Synchronization there has been an ad hoc meeting right after the summer CPWG round in NY.

There are still a few open questions of how to implement universe synchronization into E1.31 so I would recommend to "officially" call for a universe synchronization task group meeting around the January CPWG meeting in Texas.

In preparation to this the CPWG shall decide at the Vegas meeting whether we are going to maintain the EPI format or if the E1.31 standard itself shall be changed to include the universe synchronization method.

Here are the notes of the meeting we held in NY:

1. There was discussion if the "EPI" format would be the right concept to implement a universe synchronization mechanism into E1.31 or if the E1.31 standard should altered itself. Most task group members were preferring an updated version of E1.31 especially thus the discussed method will maintain the standard's downward compatibility.
2. The sync for universe synchronization shall only be carried out by one source.
3. We are aiming for a single controller setup only – don't care about multiple controllers, this is out of the scope of this standard.
4. The controller latency is not the scope, but it shall be static to avoid problems with lost packages on the network.
5. The sync packet shall be transmitted with no data.
6. The address of the sync packet shall be transmitted as HI/LO byte in octet 109/110. This will stop receivers waiting for sync packets forever and will stop them from joining every single universe's multicast group just in case it might be "the" sync universe.
7. The idea of the sync bit as part of the E1.31 option bits stays.
8. Shall we change the vector of the framing layer (octet 40-43) and skip the DMP-layer?
9. Is there a requirement to configure the universe synchronization mechanism using E1.30?
10. Shall the configuration for universe synchronization be carried out on the receiver and controller side?
11. Is there a dedicated range of universes to be synchronized or shall we allow all possible universes to be in one sync group?

The universe synchronization task group is formed by

North America

Scott M. Blair, LiteSpeed Design; Paul Kleissler, City Theatrical, Inc.; Kevin Loewen, Pathway Connectivity Inc.; Alan Martello, Acuity Brands Lighting; Maya Nigrosh, Electronic Theatre Controls Inc.; Charles Reese, Production Resource Group

Europe  
Ulrich Kunkel, E3 Engineering; Philip Nye, Acuity Brands Lighting

Asia  
Sang-Kyu Lim, ETRI

Very best regards and have a constructive meeting

Ulrich

Mit freundlichen Grüßen  
Best regards  
Dipl.-Ing. Ulrich Kunkel  
Geschäftsführer

Scott Blair spoke in favor of putting this EPI into E1.31. He said that we want to change E1.31 anyway to make a faster data rate for networks that don't have to connect to EIA 485-based DMX512 networks; when we revise that standard, this feature can be added.

Because of the strong interest within the group in advancing this standard, Michael Lay asked Maya Nigrosh to be the task group chair alternate, and to run the January task group meeting if Ulrich Kunkel is unable to attend.

### **8.3 BSR E1.33, Transport of ANSI E1.20 (RDM) in an E1.31 environment**

*Public review report. The review ended EOD October 8. A summary of the comments was sent to the CPWG on October 10.*

Scott Blair reported that there were 138 comments, but the comments in this review are more focused than the ones in the previous public review. He said that he hopes to have draft resolutions done in time for the July 2013 meeting.

### **8.4 BSR E1.37-2, Additional Message Sets for ANSI E1.20 (RDM) – Part 2, IPv4 & DNS Configuration Messages**

*Public review report. The review ended EOD October 1. A summary of the comments was sent to the CPWG on October 3.*

Simon Newton said he hopes to have a set of comment resolutions drafted for consideration by the work group at the January 2013 meeting.

### **8.5 BSR E1.37-x, Additional Message Sets for ANSI E1.20, LED walls and video displays**

*Progress report. Scott Blair et alia.*

Scott Blair reported that he had started mapping video-related PIDs in a spreadsheet and now has about 120 possible PIDs. He said that this project needs E1.33 to be completed for it to be really useful.

He also said that he has started working on an article for trade publications about why the video industry needs this standard.

Concern was expressed by Peter Willis for the expanding number of messages on a DMX512 (EIA 485) network with its limited bandwidth and the possible resulting congestion. This led to a discussion of the continuous expansion of PIDs. There is no mandatory list of PIDs; manufacturers pick and choose what to implement. It was argued that this hampers interoperability. However, others argued that the open-ended development of PIDs allows the protocol to grow. We can't imagine all the possible useful PIDs.

No motion was offered.

There was further discussion of the open structure of E1.37-x and whether this is good because particular PIDs might be buried in a document with other unrelated PIDs. The open-ended structure is so that we can quickly start on new features, but it makes for messy documentation.

No motion was offered.

## **8.6 BSR E1.45, Visible Light Communication control protocol proposal**

*Public review report. The review ends EOD October 1. Karl Ruling.*

There was discussion of a set of proposed comment resolutions and a revised draft standard.

Eric Johnson spoke against any using any addressing scheme in E1.45. He suggested just letting the 802 message's native addressing scheme work. Removing the two address bytes would make a significant difference in the payload efficiency. There was additional discussion, and the draft standard and draft comment resolutions were modified accordingly.

Kevin Loewen moved that the proposed resolutions as modified be accepted. The motion was seconded. The motion was approved with a show of hands, with all voting in favor except for three abstentions. This was approval by a supermajority.

Kevin Loewen moved that the revised BSR E1.45 be offered for a second public review. The motion was seconded. The motion was approved with a show of hands, with all voting in favor except for two abstentions. This was approval by a supermajority.

## **8.7 CPWG marketing efforts**

### **8.7.1 European Plugfests**

Ron Bonner was not present, so Peter Willis reported that it was a great success. There was a spontaneous round of applause.

### **8.7.2 LDI Connectivity Pavilion**

Bill Ellis reported that the Pavilion is almost all ready to go and in good shape.

Peter Willis thanked Bill Ellis for his work. Willis reiterated that repeatedly asking for equipment to populate a booth or stand is frustrating.

### **8.7.3 LDI Sessions – CPWG Related**

Saturday – 11:00AM – 12:30PM P05 RDM: Beyond the Basics

Sunday – 10:00AM – 11:30AM P08 Troubleshooting IP Networks

The above scheduled LDI sessions were noted. Simon Newton asked for more equipment to demonstrate during the sessions.

### **8.7.4 PLASA show report**

Peter Willis reported on the RDM stand at the PLASA trade show in London in September. He showed pictures of the completed stand and the stand during setup.

There was a discussion of the funding of RDM stands and the need to market the protocols.

No motion was offered.

### **8.7.5 PLASA Focus at Stamford**

Peter Willis talked about a NY scene shop electrician who knew nothing about the RDM-enabled devices that Willis's company had provided in scenery for a Broadway show. The electrician doesn't go to LDI, so he can't be educated there. Could there be an RDM session at Focus Stamford?

Bob Goddard pointed out that the Focus Stamford trade show is less than one month away. Karl Ruling said that programming at the Focus shows is a question for PLASA Events. He said that the possibility of adding a session now is unlikely since the schedule is complete.

There was further discussion of the Focus Stamford show and the need to educate theatre consultants. There was interest expressed by the membership in organizing a structured protocol marketing plan for 2013. Michael Lay agreed to put out a call for volunteers to write such a plan before the January meeting for review by the CPWG membership.

#### **8.7.6 Responder test results**

Simon Newton presented results of responder testing on some real products. The test results are being posted on <http://rdm.openlighting.org>.

### **9 New business**

#### **9.1 ANSI E1.11 – 2008, Entertainment Technology - USITT DMX512-A**

*Revision, reaffirmation, or withdrawal in 2013.*

Ted Paget moved that we start the process of reaffirming ANSI E1.11. The motion was seconded. There was discussion. The vote was approved with a show of hands.

#### **9.2 A standardized approach for making RDM monitoring networks**

Peter Willis argued that we need to standardize a set of PIDs to do a particular monitoring job. Right now network monitoring can be done in different ways. There was a discussion of a real product that unmutes itself on a regular basis, which causes the devices to be discovered over and over again. If the unmute happens before the initial discovery is completed, the discovery process is never completed.

No motion was offered.

#### **9.3 RDM compliance testing**

Peter Willis argued that we need RDM compliance testing and certification for products. Hans Lau spoke in favor of testing to enforce our standards.

Karl Ruling explained that PLASA could certify products, just as we certify technicians, but that certification would not be part of the Technical Standards Program. Developing an objective, defensible certification program and running it would be costly, and it would need to be self-funding to be sustainable. He suggested that anyone seriously interested in product certification develop a business proposal, outlining the potential market and the fiscal viability of a product certification program.

There was discussion. No motion was offered.

#### **9.4 RDM six years on**

Peter Willis argued that we need to work to ensure interoperability (reduce/limit the number of PIDs and insist a basic set be supported) or RDM will be an abandoned protocol in six years. He suggested that if we can make interoperability easy, RDM can displace DALI in the market.

No motion was offered.

#### **9.5 Task Group Scribe**

Peter Willis described the new TSP scribe position and what this person does. Scott Blair said that he thought a scribe would be useful for the plugfests.

No motion was offered.

#### **9.6 CPWG structure and voting membership: observation and comments**

Peter Willis suggested that his topic was really more appropriate for the Technical Standards Council, but he thought we should think about the CPWG's structure and voting membership. Meeting attendance is required to

maintain voting status, and attending meetings in North America is a hardship for Europeans. We should explore using teleconferencing for working group meetings to increase European participation.

No motion was offered.

### **9.7 Working group leadership**

Michael Lay noted that we had failed to do our usual, regular reconsideration of the working group's leadership. The meeting had now run over-schedule, so there was not time for nominations. Karl Ruling will send out an email asking for nominations. He said his position should be the one considered for replacement, but that he would be happy to serve again.

### **10 Other business and announcements**

None.

### **11 Upcoming Meetings**

*As of 27 September the next meeting is scheduled for Saturday 26 January 2013, from 09:00 to noon at the Marriott Solana in Westlake, Texas. The "Reserve a Hotel Room" link on the PLASA website is active.*

Michael Lay announced the above scheduled meeting time.

### **12 Adjournment**

Scott Blair moved that the meeting adjourn. The motion was seconded. The motion was accepted. Michael Lay declared the meeting adjourned at 12:52.

**Membership as of 24 October 2012**

Name	Company	Representing	Voting status	Int. cat.
Charles Alicea	Philips- Professional Luminaires	Royal Philips Electronics	O	MP
Simon Alpert	Lighttech Event Technologies	Lighttech Event Technologies	O	CP
Klaus Amling	Licht-Technik	Licht-Technik	O	MP
Daniel W. Antonuk	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	P	MP
Shahid Anwar	Avolites Ltd.	Avolites Ltd.	O	MP
Matthew Ardine	IATSE Local 728	IATSE Local 728	O	U
Avraham Mendall Mor "Avi"	Lightswitch	Lightswitch	O	U
Daniel Ayers	Norcostco (Sales-Midwest)	Norcostco	O	DR
Timothy Baarsch	Artistic Licence Engineering Ltd.	Artistic Licence Holdings	O	DE
Robert Barbagallo	Solotech Inc.	Solotech Inc.	O	U
Robert Bell	Acuity Brands Lighting	Acuity Brands Inc.	A	MP
BenDarrington	Wireless Solutions Sweden AB	Wireless Solutions Sweden AB	O	MP
Marcus Bengtsson	LumenRadio AB	LumenRadio AB	A	MP
Adam Bennette	Electronic Theatre Controls Ltd.	Electronic Theatre Controls, Inc.	O	MP
David Bertenshaw	David Bertenshaw	David Bertenshaw	O	G
Stephen Bickford	T. Kondos Associates	T. Kondos Associates	O	U
Torrey Bievenour	Vision Quest Lighting	Vision Quest Lighting	O	G
Scott M. Blair	Full Throttle Films/ VER	Full Throttle Films/ VER	P	DR
Lee J. Bloch	Bloch Design Group, Inc.	Bloch Design Group, Inc.	O	G
David A. Boller	Organic Machines LLC	Organic Machines LLC	O	CP
Ron Bonner	PLASA Technical Resources Office	PLASA EU	P	G
André Broucke	André Broucke	André Broucke	O	G
John (Javid) D. Butler	Integrated Theatre, Inc.	Integrated Theatre, Inc.	O	CP
Jean-Francois Canuel	Spectrum Manufacturing Inc.	A.C. Lighting Ltd.	P	CP
Steve Carlson	High Speed Design, Inc.	High Speed Design, Inc.	O	MP
Nyasha Chigwamba	Dept. of Computer Science	Rhodes University	O	U
Soo-Myong Chung	Bloch Design Group, Inc.	Bloch Design Group, Inc.	O	G

Name	Company	Representing	Voting status	Int. cat.
Paul J. Clark	HxDx	HxDx	O	CP
Edward R. Condit	Edward R. Condit	Edward R. Condit	O	G
Kimberly Corbett	Schuler Shook	Schuler Shook	P	DE
Eric Cornwell	West Side Systems	West Side Systems	O	U
Stuart Cotts	Oregon Shakespeare Festival	Oregon Shakespeare Festival	O	U
Klas Dalbjorn	Labgruppen AB	TC Group	O	MP
Milton Davis	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	MP
Gilray Densham	CAST Software	CAST Group Inc	O	MP
Gary Douglas	Acuity Brands Lighting	Acuity Brands Inc.	A	MP
Gary Dove	Dove Systems	Dove Systems	O	MP
Yongshun Duan	Macostar Physics Application Technology Development (Wuhan) Ltd.	Macostar International Ltd.	O	CP
Hamish Dumbreck	JESE Ltd.	James Embedded Systems Engineering	P	MP
Larry Dunn	City Theatrical, Inc.	City Theatrical, Inc.	A	MP
Jerry Durand	Durand Interstellar, Inc.	Durand Interstellar, Inc.	O	CP
James Eade	PLASA	PLASA	O	G
Andrew Eales	Wellington Institute of Technology	Rhodes University	O	U
Bill Ellis	Candela Controls, Inc.	Candela Controls, Inc.	O	U
Paul K. Ericson	Syska Hennessy Group Lighting Design	Syska Hennessy Group Lighting Design	O	U
Jon R. Farley	Sixteenth Avenue Systems	Sixteenth Avenue Systems	O	CP
Martin Farnik	Robe Show Lighting s.r.o.	Robe Show Lighting s.r.o.	O	MP
Doug Fleenor	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	P	MP
Trevor Forrest	Helvar Lighting Control	Helvar Lighting Control	O	MP
Howard Forryan	Harting Ltd.	Harting KGAA	A	G
Steve Friedlander	Auerbach Pollock Friedlander	Auerbach Pollock Friedlander	O	U
Garrett Gallant	Pathway Connectivity Inc.	Acuity Brands Inc.	A	MP
Phillip M. Gallo	TMB	TMB	O	DR
Ed Garstkiewicz	Harting Inc., North America	Harting KGAA	P	G
Robert Goddard	Goddard Design Co.	Goddard Design Co.	P	MP

Name	Company	Representing	Voting status	Int. cat.
Jerry Gorrell	Theatre Safety Programs	Theatre Safety Programs	O	G
Tom Grimes	High End Systems, Inc.	Barco	O	MP
Dennis Grow	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	A	U
Josh Gubler	Josh Gubler	Josh Gubler	O	CP
Rob Halliday	Rob Halliday	Rob Halliday	O	U
Sean Harding	High Output, Inc.	High Output, Inc.	O	G
Mitch Hefter	Mitch Hefter	USITT	P	U
Bill Hewlett	Hewlett Electronics	Hewlett Electronics	O	CP
Simon Hobday	Artistic Licence Engineering Ltd.	Artistic Licence Holdings	P	DE
Helge Hoffmann	JB Lighting	JB Lighting	O	MP
Jim Holladay	Luxence	Luxence	O	G
Wayne David Howell	Artistic Licence Engineering Ltd.	Artistic Licence Holdings	A	DE
John Huntington	City Tech, Ent Tech Department	I.A.T.S.E. Local 1	A	U
Osedum P. Igumbor	Dept. of Computer Science	Rhodes University	O	U
Sierk Janszen	Kiss Box	Ground Zero	O	U
Eric Johnson	Eric Johnson	Eric Johnson	O	G
Rob Johnston	Interactive Technologies, Inc.	Interactive Technologies, Inc.	O	MP
Ed Jones	Edwin Jones Co., Inc.	Edwin Jones Co., Inc.	O	CP
Tyrone Mellon_Jr.	Lex Products Corp.	Lex Products Corp.	P	CP
Jussi Kallioinen	Eastway Sound & Lighting	Eastway Sound & Lighting	O	U
Tae Gyu Kang	ETRI	Electronics and Telecommunications Research Institute	O	G
Michael Karlsson	LumenRadio AB	LumenRadio AB	P	MP
Reza Khanmalek	Spectrum Manufacturing Inc.	A.C. Lighting Ltd.	A	CP
Insu Kim	ETRI	Electronics and Telecommunications Research Institute	A	G
Peter Kirkup	Lumen Radio AB	Lumen Radio AB	A	MP
Hiroshi Kita	Marumo Electric Co., Ltd.	Marumo Electric Co., Ltd.	O	MP
Phil Klapwyk	IATSE Local 891	IATSE Local 891	O	U

Name	Company	Representing	Voting status	Int. cat.
Paul Kleissler	City Theatrical, Inc.	City Theatrical, Inc.	P	MP
Mark T. Kraft	Lehigh Electric Products Co.	Lehigh Electric Products Co.	O	MP
Edwin S. Kramer	I.A.T.S.E. Local 1	I.A.T.S.E. Local 1	P	U
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	DIN, NVBF Committee	P	U
Jason Kyle	JPK Systems Ltd.	JPK Systems Ltd.	O	MP
Roger Lattin	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	P	U
Hans Lau	LumenRadio AB	LumenRadio AB	A	MP
Michael Lay	Philips Color Kinetics	Royal Philips Electronics	P	MP
Rick Leinen	Leviton Manufacturing Co., Inc.	Leviton Manufacturing Co., Inc.	O	MP
Hans Leiter	ETC GmbH	Electronic Theatre Controls, Inc.	O	MP
Jon Lenard	Applied Electronics	Applied Electronics	O	MP
Maarten Lepelaars	eldoLED	eldoLED	O	MP
Sang-Kyu Lim	ETRI	Electronics and Telecommunications Research Institute	P	G
Joshua Liposky	Lex Products Corp.	Lex Products Corp.	A	CP
Kevin Loewen	Pathway Connectivity Inc.	Acuity Brands Inc.	P	MP
Mark Manthei	Shure Inc.	Shure Inc.	O	G
Paul F. Mardon	Pulsar Ltd.	Pulsar Ltd.	O	MP
Alan Martello	Acuity Brands Lighting	Acuity Brands Inc.	A	MP
Mick Martin	ShowCAD Control Systems	ShowCAD Control Systems	O	MP
Paul Kenneth McEwan	Zero 88	Cooper Controls Ltd.	O	MP
John Mehlretter	Lehigh Electric Products Co.	Lehigh Electric Products Co.	O	MP
John Musarra	John Musarra	John Musarra	O	U
Tobin Neis	Barbizon Companies	Barbizon Companies	O	DR
Simon Newton	Simon Newton	Simon Newton	I	G
Maya Nigrosh	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	A	MP
Philip Nye	Acuity Brands Lighting	Acuity Brands Inc.	A	MP
Lars F. Paape	Scientific Algorithms and Embedded Systems	Scientific Algorithms and Embedded Systems	O	U

Name	Company	Representing	Voting status	Int. cat.
Edward A. (Ted) Paget	Daktronics Automated Rigging Solutions	Daktronics Inc.	P	G
Gary Pritchard	LSC Lighting Systems (Aust) PTY Ltd	LSC Lighting Systems PTY Ltd	O	MP
Eric Proces	Eric Proces	Eric Proces	O	U
Torben Kaas Rasmussen	Martin Professional A/S	Martin Professional A/S	O	G
Charles Reese	Production Resource Group	Production Resource Group	P	DR
Charlie Richmond	Richmond Sound Design Ltd.	Richmond Sound Design Ltd.	O	CP
Bernardo Benito Rico	Ben-Ri Electronica S.A.	Ben-Ri Electronica S.A.	O	MP
Steve Roberts	Carr & Angier	Carr & Angier	O	G
Erwin Rol	Erwin Rol Software Engineering	Erwin Rol	O	G
Dietmar Rottinghaus	Connex GmbH	Connex GmbH	O	G
Alan M. Rowe	IATSE Local 728	I.A.T.S.E. Local 728	A	U
Richard Salzedo	Avolites Ltd.	Avolites Ltd.	O	MP
Yngve Sandboe	Sand Network Systems, Inc.	Sand Network Systems, Inc.	O	MP
Larry Schoeneman	DesignLab Chicago, Inc.	DesignLab Chicago, Inc.	P	DR
Martin Searancke	Dream Solutions Ltd.	Dream Solutions Ltd.	O	MP
Chuck Seifried	Phoenix Civic Plaza	City of Phoenix	O	U
John Sellers	AIM Northwest	AIM Northwest	O	G
Andrew Sherar	Lightmoves PLC	Lightmoves PLC	O	MP
Yehuda Shukram	Compulite Systems	Compulite Systems	O	MP
Sean Sill	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	MP
Storm K. Staley	Stormwerx	Stormwerx	O	U
Ralph Stillinger	Strand Lighting	Royal Philips Electronics	O	MP
Bart Swinnen	Luminex LCE	Luminex LCE	O	MP
Arnold Tang	Arnold Tang Productions	Arnold Tang Productions	O	U
Steve Terry	Electronic Theatre Controls	Electronic Theatre Controls, Inc.	A	MP
Geoffrey O. Thompson	Nortel Networks, Inc.	IEEE 802.3/Nortel Networks	O	G
Christopher Tilton	Westlake Reed Leskosky	Westlake Reed Leskosky	P	DE
David Timmins	Jands Electronics	Jands Electronics	O	MP
J. B. Toby	Avolites Ltd.	Avolites Ltd.	O	MP

Name	Company	Representing	Voting status	Int. cat.
Bob Toms	Catalyst Microsystems LLC	Catalyst Microsystems LLC	O	G
Robert Tooker	Robert Tooker	Robert Tooker	O	U
Tad Trylski	Tad Trylski	Tad Trylski	O	U
Stephen J. Tyrrell	Quantum Logic	Quantum Logic	O	MP
Tracy Underhill	4U Consulting	4U Consulting	O	G
Steve Unwin	Pulsar Ltd.	Pulsar Ltd.	O	MP
Samuli Valo	Picturall Ltd.	Picturall Ltd.	O	MP
Ken Vannice	Leviton Manufacturing Co., Inc.	Leviton Manufacturing Co., Inc.	P	MP
Carlo Venturati	Clay Paky S.P.A.	Clay Paky S.P.A.	O	MP
Will Wagner	Carallon Ltd.	Carallon Ltd.	O	MP
Oliver Waits	Avolites Ltd.	Avolites Ltd.	O	MP
John Warwick	Philips/Color Kinetics	Royal Philips Electronics	O	MP
Colin Waters	TMB	TMB	O	DR
Ralph Weber	ENDL Texas	ENDL Texas	O	G
Lars Wernlund	Lewlight	Lewlight	O	MP
Michael (Mike) Whetstone	Integrated Theatre, Inc.	Integrated Theatre, Inc.	O	CP
Peter Willis	Howard Eaton Lighting Ltd.	Howard Eaton Lighting Ltd.	P	CP
Loren Wilton	Showman Systems	Showman Systems	O	CP
Barbara Wohlsen	Barbara Wohlsen	Barbara Wohlsen	O	U
C. S. Wong	Macostar International Ltd.	Macostar International Ltd.	O	CP
Jiantong Wu	Beijing Special Engineering Design & Research Institute	Beijing Special Engineering Design & Research Institute	O	G
Kehang Wu	Shure Inc.	Shure Inc.	O	G
David Yellin	LightMinded Industries, Inc.	LightMinded Industries, Inc.	O	MP
Larry Zoll	Zoll Design & Consulting, LLC	Zoll Design & Consulting, LLC	O	U

P principal voting member  
A alternate voting member  
I individual voting member  
O observer non-voting member

CP custom-market producer  
MP mass-market producer  
DE designer  
DR dealer/rental company  
U user  
G general interest