US008614766B1

(12) **United States Patent**
Clark

(10) **Patent No.: US 8,614,766 B1**

(45) **Date of Patent: Dec. 24, 2013**

(54) **SYSTEMS AND METHODS FOR CONTROLLING A POWER STATE OF A REMOTE DEVICE USING CAMERA BODY BACKLIGHTING CONTROL SIGNALING**

(75) Inventor: **James E. Clark**, South Burlington, VT (US)

(73) Assignee: **Lab Partners Associates, Inc.**, South Burlington, VT (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 200 days.

(21) Appl. No.: **12/705,164**

(22) Filed: **Feb. 12, 2010**

Related U.S. Application Data

(60) Provisional application No. 61/151,885, filed on Feb. 12, 2009.

(51) **Int. Cl.**
H04N 5/222 (2006.01)

(52) **U.S. Cl.**
USPC **348/370**; 348/371

(58) **Field of Classification Search**
USPC 348/370, 371
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,039,375 A	6/1962	Umbach	
3,185,056 A	5/1965	Gold et al.	
3,205,803 A	9/1965	Burgarella et al.	
3,259,042 A	7/1966	Kagan	
RE26,627 E	7/1969	Burgarella et al.	
3,659,509 A	5/1972	Burgarella	
3,728,947 A	4/1973	Harnden et al.	
3,782,258 A	1/1974	Boekkooi et al.	
3,810,214 A	5/1974	Malone et al.	
4,047,191 A	9/1977	Coppa et al.	
4,194,818 A	3/1980	Matteson et al.	
4,201,434 A	5/1980	Tureck	
4,209,244 A	6/1980	Sahara et al.	

(Continued)

FOREIGN PATENT DOCUMENTS

CA	2616030	1/2013
CN	2007-80020420.4	6/2010

(Continued)

OTHER PUBLICATIONS

Affadavit of James E. Clark: FlashWizard II Synchronizer, signed Mar. 20, 2008; previously submitted in U.S. Appl. No. 11/697,241.

(Continued)

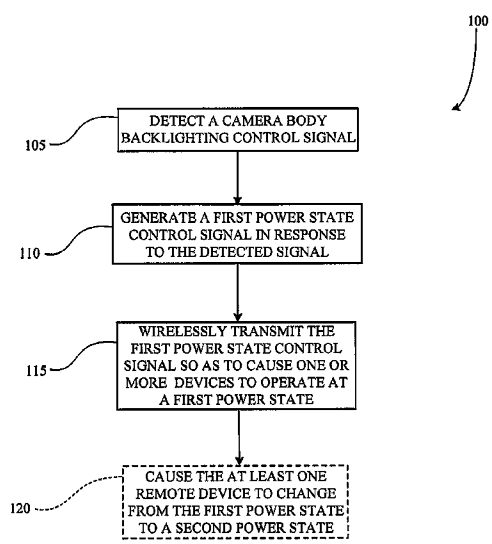
Primary Examiner — Anthony J Daniels

(74) *Attorney, Agent, or Firm* — Birch Tree IP Law & Strategy PLLC

(57) **ABSTRACT**

A control system for communicating with a wirelessly remote device, such as a lighting device, a special effects device and an in-scene device, in a photographic image-acquisition setting using a camera body. The control system is configured to detect a camera body backlighting control signal. In response to detecting of the camera body backlighting control signal, the control system generates a power state control signal for controlling the power state of the wirelessly remote device. The control system then causes the power state control signal to be wirelessly transmitted to the remote device so as to cause the remote device to operate in a first power state. The control system also causes the remote device to change from the first power state to a second power state. Such a system can allow a photographer to easily control the remote device while remaining at the camera body.

26 Claims, 11 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

4,333,719	A	6/1982	Takami et al.	
4,344,680	A	8/1982	Ishida et al.	
4,351,594	A	9/1982	Ishida et al.	
4,355,309	A	10/1982	Hughey et al.	
4,482,895	A	11/1984	Weinberg	
4,509,845	A	4/1985	Mizokami	
4,571,049	A	2/1986	Tsunefuji et al.	
4,573,786	A	3/1986	Taniguchi et al.	
4,603,954	A	8/1986	Egawa et al.	
4,636,052	A	1/1987	Bowsher	
4,643,551	A	2/1987	Ohmori	
4,693,582	A	9/1987	Kawamura et al.	
4,740,804	A	4/1988	Shands	
4,816,850	A	3/1989	Phillipeaux et al.	
4,816,855	A	3/1989	Kitaura et al.	
4,884,094	A	11/1989	Kitaura et al.	
4,988,584	A	1/1991	Shaper	
5,016,037	A	5/1991	Taniguchi et al.	
5,159,375	A	10/1992	Taniguchi et al.	
5,283,610	A	2/1994	Sasaki	
5,299,012	A	3/1994	Tsuruta et al.	
5,359,375	A	10/1994	Clark	
5,384,611	A	1/1995	Tsuji et al.	
5,422,543	A	6/1995	Weinberg	
5,436,531	A	7/1995	Weinberg	
5,521,708	A	5/1996	Beretta	
5,640,623	A	6/1997	Sasaki	
5,692,223	A	11/1997	Ichikawa et al.	
5,708,833	A	1/1998	Kinney et al.	
5,713,050	A	1/1998	Ozawa	
5,721,971	A	2/1998	Sasaki	
5,734,934	A	3/1998	Horinishi et al.	
5,754,898	A	5/1998	Nakano	
5,848,306	A	12/1998	Shono	
6,006,039	A	12/1999	Steinberg et al.	
6,029,013	A	2/2000	Larkin et al.	
6,052,539	A	4/2000	Latorre	
6,088,542	A	7/2000	Yanai et al.	
6,127,940	A	10/2000	Weinberg	
6,167,199	A	12/2000	Fukui	
6,188,431	B1 *	2/2001	Oie	348/211.5
6,278,481	B1	8/2001	Schmidt	
6,351,610	B1	2/2002	Numako et al.	
6,353,711	B1	3/2002	Numako et al.	
6,366,737	B1	4/2002	Numako et al.	
6,400,907	B1	6/2002	Izukawa	
6,404,987	B1	6/2002	Fukui	
6,430,369	B2	8/2002	Lee et al.	
6,453,154	B1	9/2002	Haber et al.	
6,524,237	B1	2/2003	McGowan	
6,618,557	B1	9/2003	Ziemkowski	
6,625,399	B1	9/2003	Davis	
6,683,654	B1	1/2004	Haijima	
6,718,135	B2	4/2004	Kawasaki et al.	
6,731,952	B2	5/2004	Schaeffer et al.	
6,748,165	B2	6/2004	Ogasawara	
6,778,764	B2	8/2004	Barghini et al.	
6,798,986	B2	9/2004	Hagiuda	
6,941,067	B2	9/2005	Muramatsu	
7,016,603	B2	3/2006	Clark	
7,035,534	B2	4/2006	Shih et al.	
7,133,607	B2	11/2006	Clark	
7,184,658	B2	2/2007	Squillace	
7,362,965	B2	4/2008	Clark	
7,437,063	B2	10/2008	Clark	
7,446,800	B2	11/2008	Holmes	
7,463,304	B2	12/2008	Murray	
7,684,692	B2	3/2010	Kashiyama	
7,702,228	B2	4/2010	Clark	
7,714,908	B2	5/2010	Holmes	
7,764,875	B2	7/2010	Clark	
7,775,575	B2	8/2010	Clark	
7,783,188	B2 *	8/2010	Clark	396/198
7,834,894	B2	11/2010	Swanson et al.	
7,877,005	B2 *	1/2011	Okubo	396/56
7,880,761	B2	2/2011	Clark	
7,885,533	B2	2/2011	Clark	
7,965,335	B2 *	6/2011	Niblock	348/371
7,969,504	B2	6/2011	Matsuda et al.	
7,970,267	B1	6/2011	Clark	
8,116,620	B2	2/2012	King	
8,116,621	B2	2/2012	King	
8,121,468	B2	2/2012	Clark	
8,130,276	B2	3/2012	Holmes	
8,134,576	B2	3/2012	Swanson et al.	
8,180,210	B2	5/2012	Clark	
8,326,136	B1	12/2012	Clark	
8,326,140	B2	12/2012	Clark	
8,326,141	B1	12/2012	Clark	
8,331,776	B2	12/2012	Clark	
8,351,774	B2	1/2013	Clark	
8,526,808	B2	9/2013	Clark	
8,532,476	B2	9/2013	Clark	
8,538,250	B2	9/2013	Clark	
8,559,804	B1	10/2013	Clark	
8,571,401		10/2013	Clark	
8,571,406		10/2013	Clark	
2001/0042149	A1	11/2001	Ito et al.	
2002/0009296	A1	1/2002	Shaper et al.	
2002/0013161	A1	1/2002	Schaeffer et al.	
2002/0067425	A1	6/2002	Iverson	
2002/0067923	A1	6/2002	Fujimura	
2003/0128272	A1	7/2003	Clough et al.	
2003/0133018	A1	7/2003	Ziemkowski	
2003/0161621	A1	8/2003	Takaiwa	
2003/0193588	A1	10/2003	Yuen et al.	
2004/0036774	A1	2/2004	Nichols et al.	
2005/0006484	A1	1/2005	Ito	
2005/0174434	A1	8/2005	Chang et al.	
2006/0014563	A1	1/2006	Cheng	
2006/0216009	A1	9/2006	Kawamura	
2006/0275024	A1	12/2006	McNary	
2006/0291016	A1	12/2006	Ishigami et al.	
2008/0065137	A1	3/2008	Boucher et al.	
2008/0065139	A1	3/2008	Scribner et al.	
2008/0180531	A1	7/2008	Sekiguchi	
2009/0129765	A1	5/2009	King	
2009/0135262	A1	5/2009	Ogasawara	
2009/0278479	A1	11/2009	Platner et al.	
2009/0310012	A1	12/2009	Ueda et al.	
2010/0158494	A1	6/2010	King	
2010/0177212	A1	7/2010	Holmes	
2010/0202767	A1	8/2010	Shirakawa	
2010/0209089	A1	8/2010	King	
2011/0001665	A1	1/2011	King	
2011/0119409	A1	5/2011	King	
2011/0123185	A1	5/2011	Clark	
2011/0128390	A1	6/2011	Clark	
2011/0129207	A1	6/2011	King et al.	
2011/0167008	A1	7/2011	King	
2012/0027395	A1	2/2012	Clark	
2012/0099847	A1	4/2012	Clark	
2012/0120281	A1	5/2012	Swanson et al.	
2012/0127340	A1	5/2012	Holmes	
2012/0127361	A1	5/2012	Clark	
2012/0140088	A1	6/2012	Clark	
2012/0148221	A1	6/2012	Clark	
2012/0194699	A1	8/2012	Kouno	
2012/0207459	A1	8/2012	Clark	
2012/0207460	A1	8/2012	Clark	
2012/0243859	A1	9/2012	Clark	
2013/0089313	A1	4/2013	Clark	
2013/0094845	A1	4/2013	Clark	
2013/0100340	A1	4/2013	Clark	

FOREIGN PATENT DOCUMENTS

CN	2010-10600736.4		2/2012
CN	2010-10600736.4		12/2012
EP	0984320	A1	3/2000
EP	07760263.9		1/2011
EP	07760263.9		7/2011
EP	8756458.9		7/2011
EP	11177995.5		12/2011

(56) **References Cited**

FOREIGN PATENT DOCUMENTS

EP	11177995.5		7/2012
EP	11177997.1		12/2012
JP	56-143422		11/1981
JP	59-064821	A	4/1984
JP	59-170822		9/1984
JP	63-018874		1/1988
JP	05-093948		4/1993
JP	07-159866		6/1995
JP	2002-244193	A	8/2002
JP	2002-318413		10/2002
JP	2003-172970	A	6/2003
JP	2003-215672	A	7/2003
JP	2003-325451		11/2003
JP	2004-072230		3/2004
JP	2006-149935		6/2006
JP	2007-067870	A	3/2007
KR	10-0728117		6/2007
WO	9638925	A1	12/1996
WO	PCT/US2003/37271		5/2004
WO	PCT/US2007/066162		11/2007
WO	PCT/US2006/028229		2/2008
WO	PCT/US2008/065137		9/2008
WO	PCT/US2008/065139		9/2008
WO	PCT/US2010/024088		7/2010
WO	2010093914	A1	8/2010
WO	2010093927	A1	8/2010
WO	2010093994	A1	8/2010
WO	PCT/US2010/024108		9/2010
WO	PCT/US2010/024195		9/2010
WO	2012009537	A1	1/2011
WO	PCT/US2011/044008		11/2011
WO	PCT/US2012/025915		6/2012
WO	2012161772	A1	11/2012

OTHER PUBLICATIONS

Analog Devices Technical Data Sheet for ADF7020-1 Transceiver IC, Analog Devices, Inc., 2005, pp. 1-44.

ASH Transceiver Impedance Matching; Document Created on Dec. 10, 2001; pp. 1 to 10; http://www.rfm.com/products/apnotes/antennamatch.pdf; last viewed on Dec. 15, 2005.

Canon EOS 40D Usuer's Manual; about Sep. 2007; Canon Corporation.

Declaration of James E. Clark filed on Feb. 18, 2005 in U.S. Appl. No. 10/306,759.

Ken Rockwell; How to Use Nikon Strobes Wirelessly, for Free!; Dec. 17, 2005; http://web.archive.org/web/20051217091704/http://www.kenrockwell.com/nikon/ittlslave.htm; last viewed at Internet archive on Apr. 1, 2010.

Nikon D2x; Sep. 2004; pp. 1 to 12; Nikon Corporation.

Nikon WT-1 Transmitter User's Manual; around Dec. 2003; Nikon Corporation.

Nikon WT-2 Article, Part 1; Nikon Corporation; http://nikonimaging.com/global/technology/scene/11/Index.htm; last viewed on Mar. 14, 2008.

Nikon WT-2 Article, Part 2: Nikon Corporation; http://nikonimaging.com/global/technology/scene/11/Index_02.htm; last viewed on Mar. 14, 2008.

Phil Askey, Nikon D2H Review: 15. Wireless: Digital Photography Review, Wireless (Review of WT-1 Transmitter); Dec. 2003; http://www.dpreview.com/reviews/NikonD2H/page15.asp; last viewed on Mar. 18, 2008.

Phil Askey, Nikon D2H Review: 1. Introduction: Digital Photography Review, Nikon D2H Review, Dec. 2003; http://www.dpreview.com/reviews/NikonD2H/; last viewed on Mar. 18, 2008.

Phil Askey, Nikon D2Hs Preview: 1. Introduction: Digital Photography Review (includes Review of WT-2 Transmitter); Feb. 2005; http//www.dpreview.com/articles/nikond2hs/; last viewed Mar. 14, 2008.

PocketWizard MultiMAX Transceiver New Trigger Control Software Features, by LPA Design, pp. 1 to 6, United States.

PocketWizard MultiMAX Transceiver Owner's Manual, by LPA Design, May 2001, pp. 1-55 and "Relay Mode" on p. 40, United States.

Quantum FreeWire Transceiver; Jul. 17, 2005; pp. 1 to 7; http://web.archive.org/web/20050717015832/http://www.qtm.com/wireless/freewire.html; last viewed at Internet Archive on Apr. 25, 2008.

Quantum FreeWire Transceiver; Nov. 15, 2004; pp. 1 to 7; http://web.archive.org/web/20041115093657/http://www.qtm.com/wireless/freewire.html; last viewed at Internet Archive on Apr. 25, 2008.

Quantum FreeWire Transceiver; Oct. 7, 2001; pp. 1 to 6; http://web.archive.org/web/20011007140624/http://www.qtm.com/wireless/freewire.html; last viewed at Internet Archive on Apr. 25, 2008.

Rob Galbraith; Casting Light on the PocketWizard MiniTT1 and FlexTT5; Parts 1 to 5; Feb. 16, 2009; http://www.robgalbraith.com/bins/multi_page.asp?cid=7-9884-9903; last viewed on Jul. 12, 2012.

Robert Hanashiro; Equipment Corner—News & Notes for all Those Gear-Heads; Nov. 26, 2001; pp. 1 to 3; http://www.sportsshooter.com/news_story.html?id=594; last viewed on Septemer, 17, 2002.

Strobist Blog: PocketWizard FlexTT5 and MinITT1: Full Review; Feb. 16 to 18, 2009; blog comments, pp. 1 to 40; http://strobist.blogspot.com/2009/02/pocketwizard-flextt5-and-minitt1-full.html; last viewed on Feb. 18, 2009.

Strobist Blog: PocketWizard FlexTT5 and MinITT1: Full Review Feb. 16, 2009; pp. 1 to 11; http://strobist.blogspot.com/2009/02/pocketwizard-flextt5-and-minitt1-full.html; last viewed on Feb. 18, 2009.

U.S. Appl. No. 10/306,759, Aug. 29, 2003, Office Action, 7,016,603.

U.S. Appl. No. 10/306,759, Dec. 18, 2003, Response to Office Action, 7,016,603.

U.S. Appl. No. 10/306,759, Dec. 24, 2003, Examiner Interview Summary, 7,016,603.

U.S. Appl. No. 10/306,759, Mar. 27, 2004, Final Office Action, 7,016,603.

U.S. Appl. No. 10/306,759, Apr. 15, 2004, Examiner Interview Summary, 7,016,603.

U.S. Appl. No. 10/306,759, Apr. 20, 2004, Response to Final Office Action, 7,016,603.

U.S. Appl. No. 10/306,759, Aug. 24, 2004, Office Action, 7,016,603.

U.S. Appl. No. 10/306,759, Feb. 18, 2005, Request for Continued Examination, 7,016,603.

U.S. Appl. No. 10/306,759, Mar. 29, 2005, Office Action, 7,016,603.

U.S. Appl. No. 10/306,759, Apr. 14, 2005, Response to Office Action, 7,016,603.

U.S. Appl. No. 10/306,759, Jun. 29, 2005, Final Office Action, 7,016,603.

U.S. Appl. No. 10/306,759, Aug. 25, 2005, Response to Final Office Action, 7,016,603.

U.S. Appl. No. 10/306,759, Sep. 16, 2005, Notice of Allowance, 7,016,603.

U.S. Appl. No. 10/306,759, Oct. 18, 2005, 312 Amendment, 7,016,603.

U.S. Appl. No. 10/306,759, Dec. 20, 2005, Response to 312 Amendment, 7,016,603.

U.S. Appl. No. 10/306,759, Jan. 4, 2006, Response to 312 Amendment, 7,016,603.

U.S. Appl. No. 10/306,759, Nov. 18, 2006, Certificate of Correction, 7,016,603.

U.S. Appl. No. 11/305,668, Mar. 8, 2006, Office Action, 7,133,607.

U.S. Appl. No. 11/305,668, Jun. 8, 2006, Response to Office Action, 7,133,607.

U.S. Appl. No. 11/305,668, Jun. 13, 2006, Supplemental Response to Request for Clarification by the Examiner, 7,133,607.

U.S. Appl. No. 11/305,668, Jun. 30, 2006, Notice of Allowance, 7,133,607.

U.S. Appl. No. 11/305,668, Mar. 29, 2007, Request for Correction of Letters Patent, 7,133,607.

U.S. Appl. No. 11/529,203, Aug. 14, 2007, Office Action, 7,362,965.

U.S. Appl. No. 11/529,203, Oct. 16, 2007, Terminal Disclaimer, 7,362,965.

U.S. Appl. No. 11/529,203, Oct. 16, 2007, Response to Office Action, 7,362,965.

(56) **References Cited**

OTHER PUBLICATIONS

U.S. Appl. No. 11/529,203, Oct. 25, 2007, Terminal Disclaimer, 7,362,965.
U.S. Appl. No. 11/529,203, Dec. 14, 2007, Notice of Allowance, 7,362,965.
U.S. Appl. No. 12/104,950, Dec. 31, 2009, Office Action, 7,764,875.
U.S. Appl. No. 12/104,950, Feb. 1, 2010, Response to Office Action, 7,764,875.
U.S. Appl. No. 12/104,950, Mar. 23, 2010, Notice of Allowance, 7,764,875.
U.S. Appl. No. 12/843,254, Jul. 27, 2010, Preliminary Remarks, 8,121,468.
U.S. Appl. No. 12/843,254, Aug. 25, 2011, Office Action, 8,121,468.
U.S. Appl. No. 12/843,254, Aug. 25, 2011, Response to Office Action, 8,121,468.
U.S. Appl. No. 12/843,254, Aug. 25, 2011, Terminal Disclaimer, 8,121,468.
U.S. Appl. No. 12/843,254, Nov. 28, 2011, Notice of Allowance, 8,121,468.
U.S. Appl. No. 13/399,333, Jun. 14, 2012, Office Action.
U.S. Appl. No. 11/488/491, Oct. 16, 2007, Office Action.
U.S. Appl. No. 11/490,322, Apr. 20, 2010, Office Action, 7,880,761.
U.S. Appl. No. 11/490,322, Jul. 12, 2010, Response to Office Action, 7,880,761.
U.S. Appl. No. 11/490,322, Sep. 15, 2010, Notice of Allowance, 7,880,761.
U.S. Appl. No. 11/697,241, Nov. 8, 2007, Office Action, 7,437,063.
U.S. Appl. No. 11/697,241, Mar. 10, 2008, Response to Office Action, 7,437,063.
U.S. Appl. No. 11/697,241, Mar. 24, 2008, Examiner Interview Summary, 7,437,063.
U.S. Appl. No. 11/697,241, Jun. 9, 2008, Notice of Allowance, 7,437,063.
U.S. Appl. No. 12/250,914, Jun. 12, 2009, Office Action, 7,702,228.
U.S. Appl. No. 12/250,914, Jun. 29, 2009, Response to Office Action and Terminal Disclaimer, 7,702,228.
U.S. Appl. No. 12/250,914, Oct. 28, 2009, Terminal Disclaimer, 7,702,228.
U.S. Appl. No. 12/250,914, Dec. 3, 2009, Notice of Allowance, 7,702,228.
U.S. Appl. No. 12/762,811, Dec. 28, 2010, Office Action, 7,970,267.
U.S. Appl. No. 12/762,811, Mar. 28, 2011, Response to Office Action, 7,970,267.
U.S. Appl. No. 12/762,811, Mar. 28, 2011, Terminal Disclaimer, 7,970,267.
U.S. Appl. No. 12/762,811, Apr. 20, 2011, Notice of Allowance, 7,970,267.
U.S. Appl. No. 13/169,413, Dec. 20, 2011, Office Action, 8,180,210.
U.S. Appl. No. 13/169,413, Jan. 16, 2012, Response to Office Action, 8,180,210.
U.S. Appl. No. 13/169,413, Jan. 16, 2012, Terminal Disclaimers, 8,180,210.
U.S. Appl. No. 13/169,413, Mar. 22, 2012, Notice of Allowance, 8,180,210.
U.S. Appl. No. 13/438,500, Jun. 18, 2012, Office Action.
U.S. Appl. No. 12/129,447, Apr. 12, 2010, Notice of Allowance, 7,775,575.
U.S. Appl. No. 12/129,447, Apr. 12, 2010, Examiner Amendment, 7,775,575.
U.S. Appl. No. 12/129,402, Apr. 19, 2010, Notice of Allowance, 7,783,188.
U.S. Appl. No. 12/861,445, Sep. 30, 2010, Notice of Allowance, 7,885,533.
U.S. Appl. No. 13/021,951, Nov. 25, 2011, Notice of Allowance.
U.S. Appl. No. 13/021,951, Feb. 13, 2012, Withdrawal of Notice of Allowance.
U.S. Appl. No. 13/021,951, Feb. 22, 2012, Office Action.
U.S. Appl. No. 13/253,596, Nov. 30, 2011, Office Action.
U.S. Appl. No. 13/253,596, Feb. 29, 2012, Response to Office Action.
U.S. Appl. No. 13/253,596, May 9, 2012, Final Office Action.
U.S. Appl. No. 12/705,052, Mar. 27, 2012, Office Action.
U.S. Appl. No. 12/705,052, Jun. 27, 2012, Response to Office Action.
U.S. Appl. No. 12/705,096, Mar. 12, 2012, Office Action.
U.S. Appl. No. 12/705,096, Jun. 12, 2012, Response to Office Action.
U.S. Appl. No. 12/705,164, Mar. 29, 2012, Office Action.
U.S. Appl. No. 12/705,164, Jun. 29, 2012, Response to Office Action.
U.S. Appl. No. 13/399,333, filed Feb. 17, 2012.
U.S. Appl. No. 13/016,345, filed Jan. 28, 2011.
U.S. Appl. No. 13/438,500, filed Apr. 3, 2012.
U.S. Appl. No. 13/021,951, filed Feb. 7, 2011.
U.S. Appl. No. 13/253,596, filed Oct. 5, 2011.
U.S. Appl. No. 13/201,182, filed Aug. 11, 2011.
U.S. Appl. No. 13/201,185, filed Aug. 11, 2011.
U.S. Appl. No. 13/201,281, filed Aug. 12, 2011.
U.S. Appl. No. 13/208,686, filed Aug. 12, 2011.
U.S. Appl. No. 13/208,706, filed Aug. 12, 2011.
U.S. Appl. No. 13/401,175, filed Feb. 21, 2012.
U.S. Appl. No. 12/705,052, filed Feb. 12, 2010.
U.S. Appl. No. 12/705,096, filed Feb. 12, 2010.
U.S. Appl. No. 12/705,164, filed Feb. 12, 2010.
XE-200 RF Shutter Release for Rebel 2000; http://zenopuseelectronix.com/XE-200.html; last viewed on Sep. 9, 2002.
U.S. Appl. No. 12/705,096, Aug. 8, 2012, Notice of Allowance, 8,326,136.
U.S. Appl. No. 12/705,052, Sep. 5, 2012, Notice of Allowance, 8,326,141.
U.S. Appl. No. 13/399,333, Sep. 14, 2012, Response to Office Action, 8,351,774.
U.S. Appl. No. 13/399,333, Sep. 14, 2012, Terminal Disclaimers, 8,351,774.
U.S. Appl. No. 13/438,500, Sep. 14, 2012, Response to Office Action.
U.S. Appl. No. 13/438,500, Sep. 14, 2012, Terminal Disclaimers.
U.S. Appl. No. 13/399,333, Sep. 28, 2012, Notice of Allowance, 8,351,774.
U.S. Appl. No. 12/705,164, Nov. 29, 2012, RCE.
U.S. Appl. No. 13/208,706, Dec. 26, 2012, Office Action.
U.S. Appl. No. 13/208,686, Feb. 6, 2013, Office Action.
U.S. Appl. No. 13/183,046, Feb. 13, 2013, Office Action.
U.S. Appl. No. 13/708,326, filed Dec. 7, 2012.
U.S. Appl. No. 13/692,515, filed Dec. 3, 2012.
U.S. Appl. No. 13/692,550, filed Dec. 3, 2012.
U.S. Appl. No. 13/735,325, filed Jan. 7, 2013.
Nikon D80 User's Manual; see "Modeling Flash," p. 98; published on Aug. 11, 2006.
U.S. Appl. No. 13/735,325, Mar. 15, 2013, Office Action.
U.S. Appl. No. 13/735,325, Mar. 21, 2013, Response to Office Action w/Terminal Disclaimers.
U.S. Appl. No. 13/708,326, Mar. 26, 2013, Notice of Allowance.
U.S. Appl. No. 13/208,706, Mar. 26, 2013, Response to Office Action.
U.S. Appl. No. 13/016,345, Apr. 26, 2013, Restriction Requirement.
U.S. Appl. No. 13/183,046, Apr. 29, 2013, Response to Office Action.
U.S. Appl. No. 13/401,175, May 6, 2013, Office Action.
U.S. Appl. No. 13/208,686, May 6, 2013, Response to Office Action.
U.S. Appl. No. 13/735,325, May 14, 2013, Notice of Allowance.
U.S. Appl. No. 13/692,550, May 16, 2013, Notice of Allowance.
U.S. Appl. No. 13/201,182, May 24, 2013, Restriction Requirement.
U.S. Appl. No. 13/438,500, Jun. 12, 2013, Notice of Allowance.
U.S. Appl. No. 13/692,515, Jun. 24, 2013, Notice of Allowance.
U.S. Appl. No. 13/208,706, Jul. 2, 2013, Notice of Allowance.
U.S. Appl. No. 13/692,550, Jul. 2, 2013, Supplemental Notice of Allowance.
U.S. Appl. No. 13/208,686, Jul. 15, 2013, Final Office Action.
U.S. Appl. No. 13/183,046, Jul. 31, 2013, Notice of Allowance.
U.S. Appl. No. 13/401,175, Dated Aug. 6, 2013, Response to Office Action.
U.S. Appl. No. 13/016,345, Dated Sep. 17, 2013, Office Action.
U.S. Appl. No. 13/401,175, Dated Sep. 20, 2013, Notice of Allowance.
U.S. Appl. No. 13/201,281, Dated Sep. 25, 2013, Office Action.
U.S. Appl. No. 13/208,686, Dated Sep. 30, 2013, Notice of Allowance.

(56) **References Cited**

OTHER PUBLICATIONS

U.S. Appl. No. 14/021,200, Dated Oct. 8, 2013, Office Action.

U.S. Appl. No. 14/201,200, filed Sep. 9, 2013.

U.S. Appl. No. 14/015,336, filed Aug. 30, 2013.

* cited by examiner

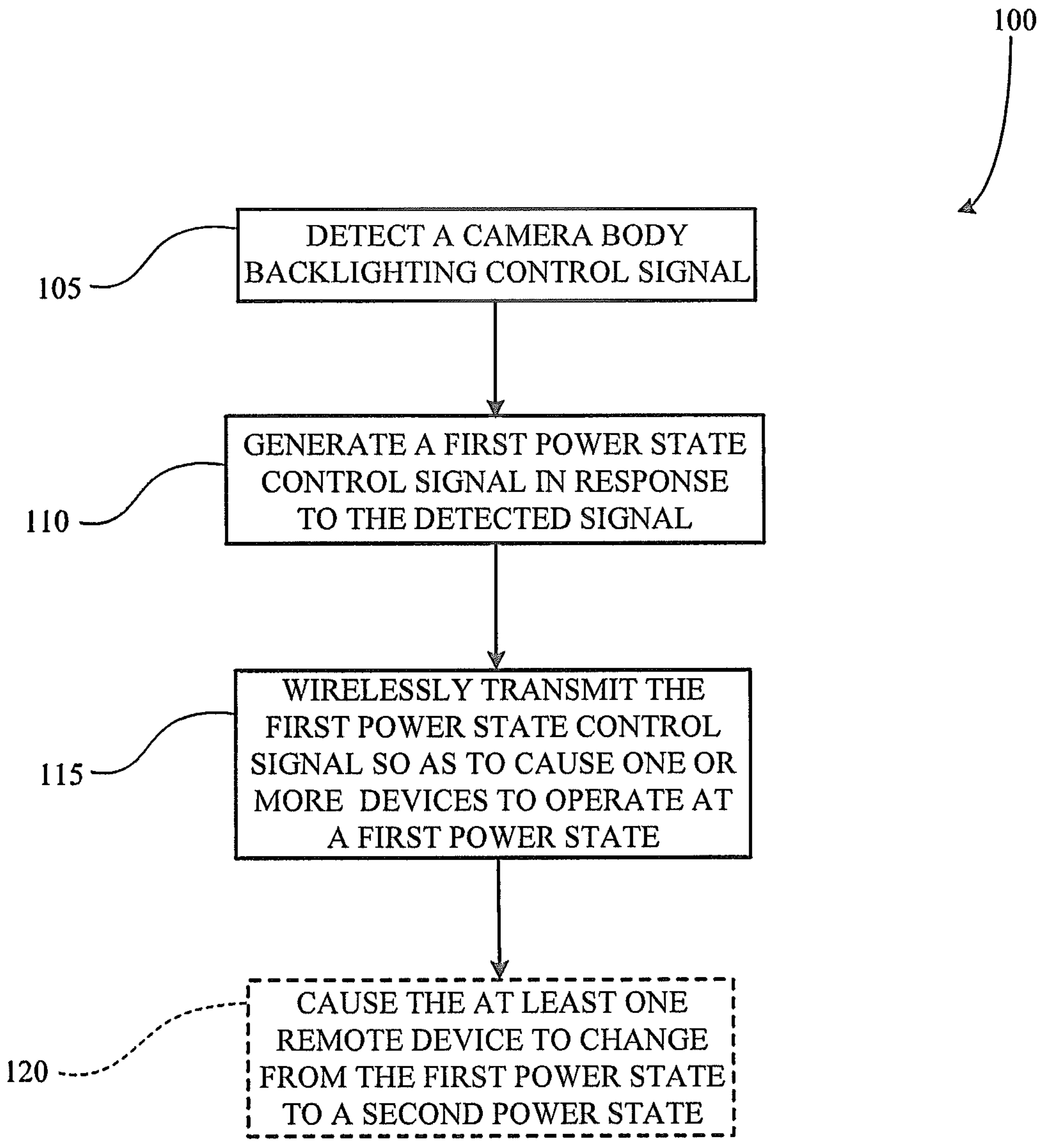

100
105
DETECT A CAMERA BODY BACKLIGHTING CONTROL SIGNAL
110
GENERATE A FIRST POWER STATE CONTROL SIGNAL IN RESPONSE TO THE DETECTED SIGNAL
115
WIRELESSLY TRANSMIT THE FIRST POWER STATE CONTROL SIGNAL SO AS TO CAUSE ONE OR MORE DEVICES TO OPERATE AT A FIRST POWER STATE
120
CAUSE THE AT LEAST ONE REMOTE DEVICE TO CHANGE FROM THE FIRST POWER STATE TO A SECOND POWER STATE

FIG. 1

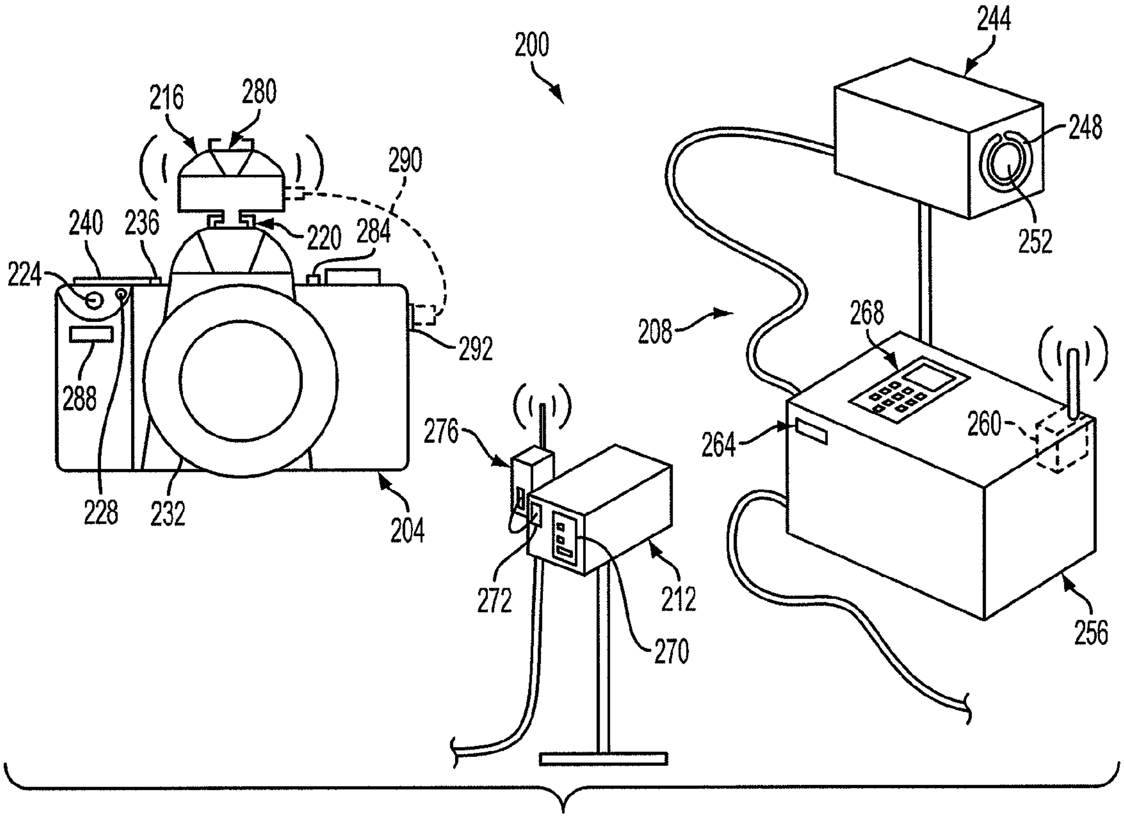

200
216
280
290
240
236
220
284
224
292
288
228
232
204
276
272
212
270
244
248
252
208
268
264
260
256

FIG. 2

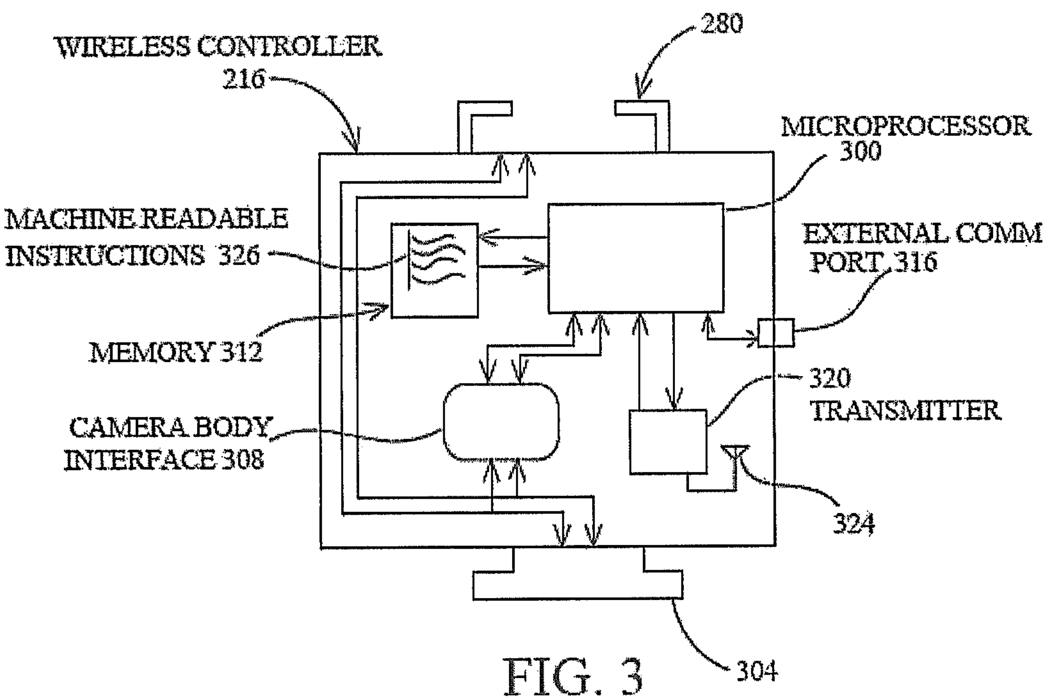

WIRELESS CONTROLLER
216
280
MICROPROCESSOR
300
MACHINE READABLE
INSTRUCTIONS 326
EXTERNAL COMM
PORT 316
MEMORY 312
320
TRANSMITTER
CAMERA BODY
INTERFACE 308
324
304

FIG. 3

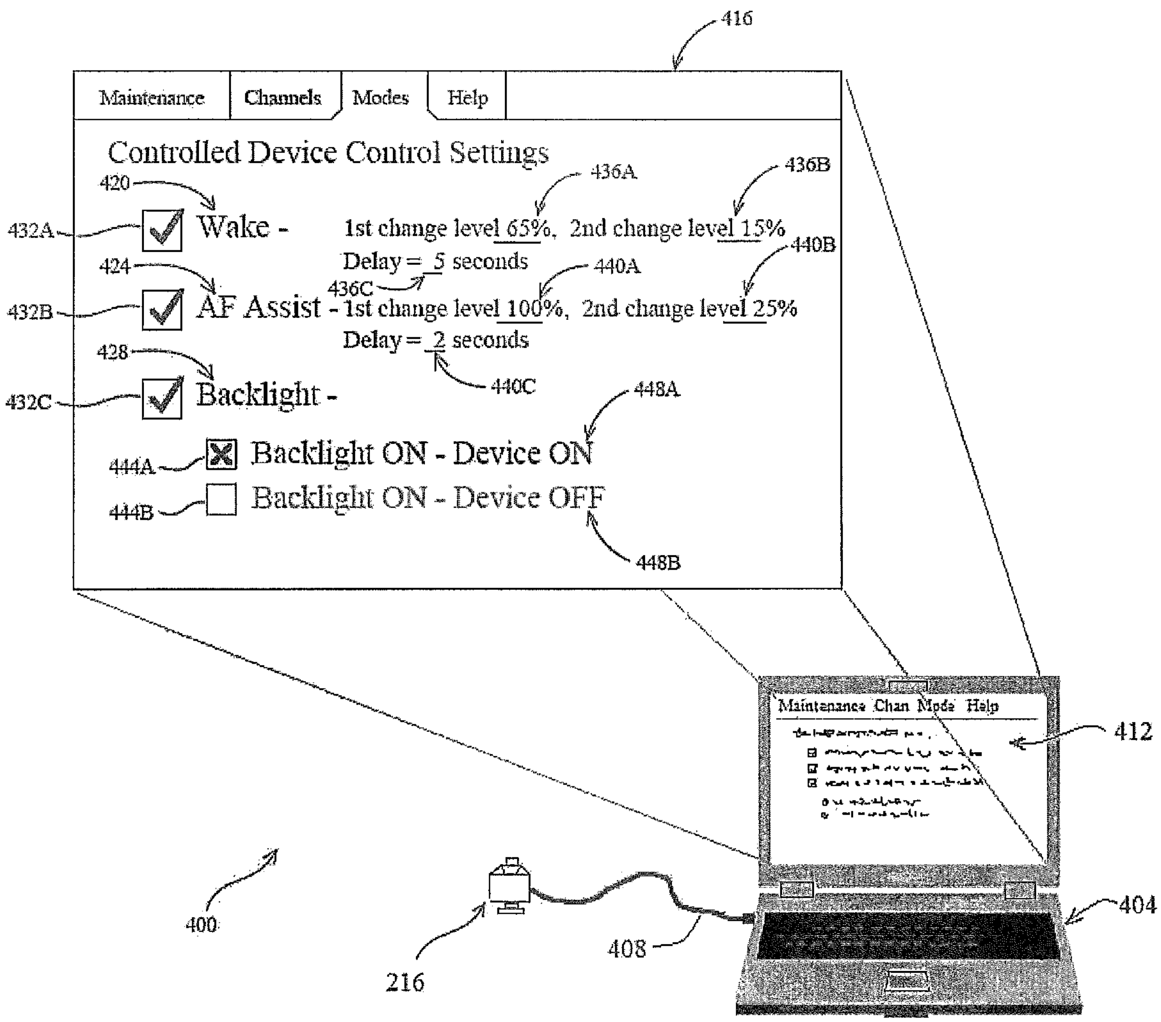
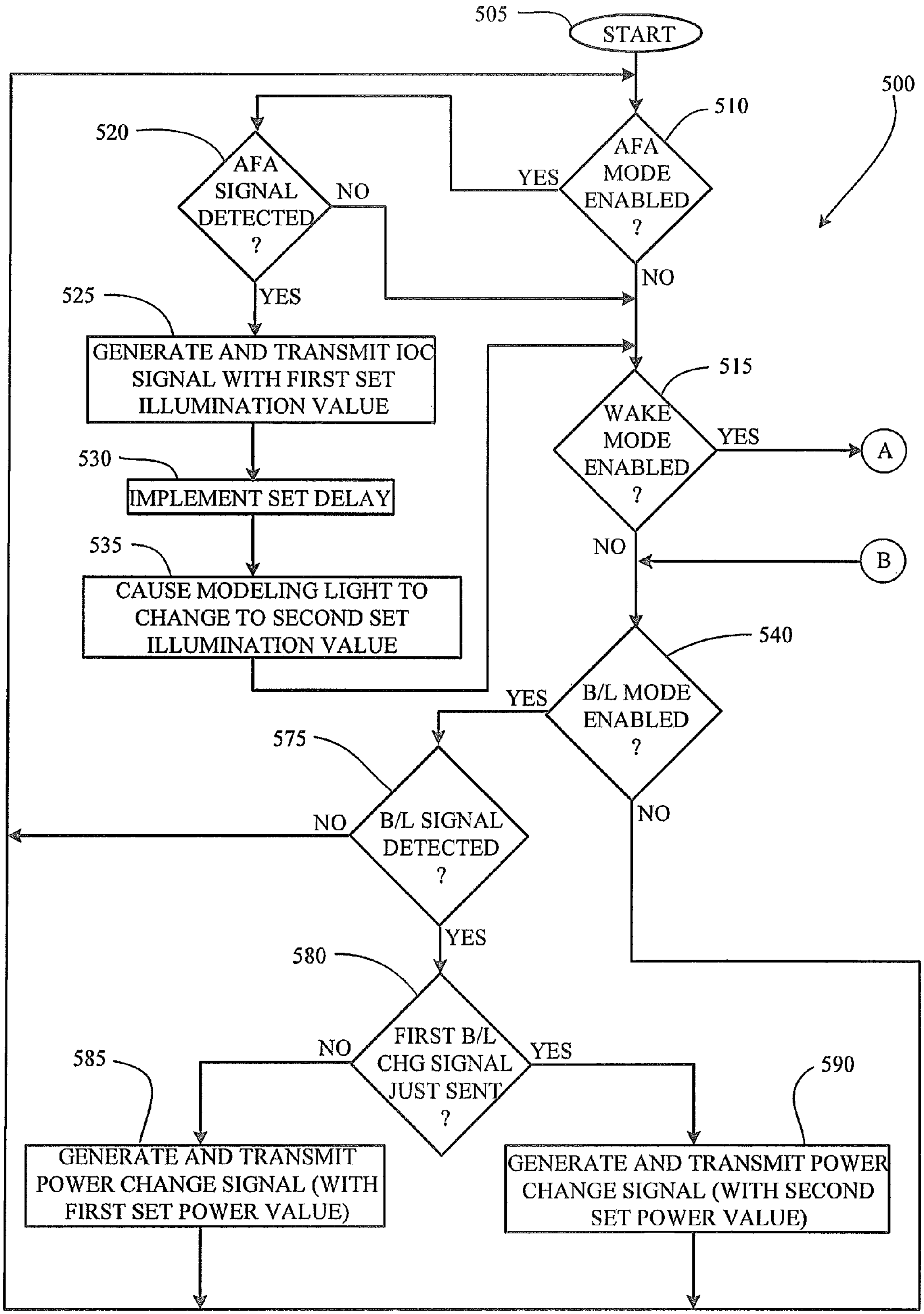

416
Maintenance
Channels
Modes
Help
Controlled Device Control Settings
420
436A
436B
432A
Wake -
1st change level 65%, 2nd change level 15%
440B
Delay = 5 seconds
424
440A
436C
432B
AF Assist - 1st change level 100%, 2nd change level 25%
Delay = 2 seconds
428
440C
432C
Backlight -
448A
444A
Backlight ON - Device ON
444B
Backlight ON - Device OFF
448B
Maintenance Chan Mode Help
412
400
216
408
404

FIG. 4



505
START
500
510
AFA MODE ENABLED ?
YES
NO
520
AFA SIGNAL DETECTED ?
NO
YES
525
GENERATE AND TRANSMIT IOC SIGNAL WITH FIRST SET ILLUMINATION VALUE
530
IMPLEMENT SET DELAY
535
CAUSE MODELING LIGHT TO CHANGE TO SECOND SET ILLUMINATION VALUE
515
WAKE MODE ENABLED ?
YES
A
NO
B
540
B/L MODE ENABLED ?
YES
NO
575
B/L SIGNAL DETECTED ?
NO
YES
580
FIRST B/L CHG SIGNAL JUST SENT ?
NO
YES
585
GENERATE AND TRANSMIT POWER CHANGE SIGNAL (WITH FIRST SET POWER VALUE)
590
GENERATE AND TRANSMIT POWER CHANGE SIGNAL (WITH SECOND SET POWER VALUE)

FIG. 5A

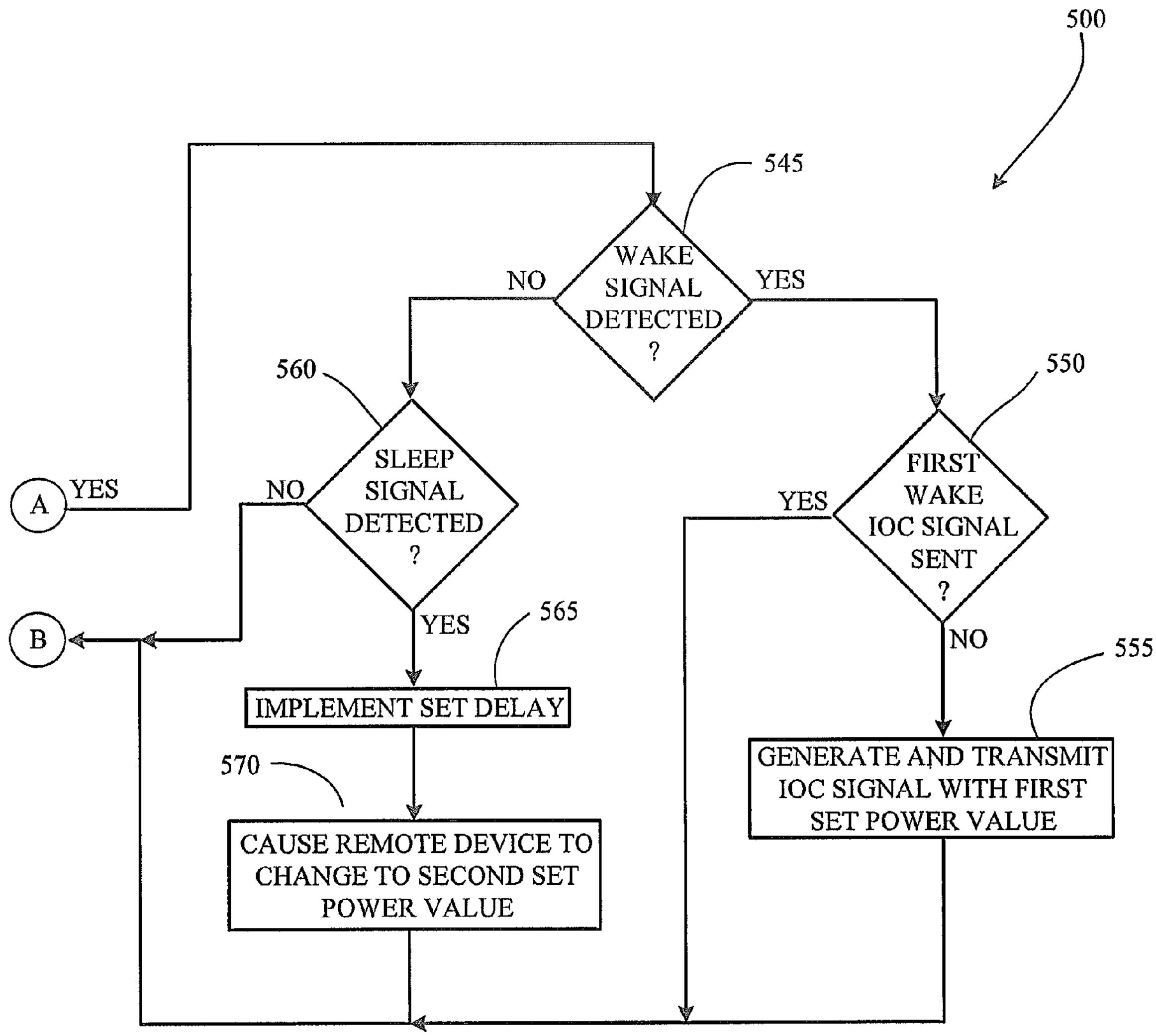

500
545
WAKE SIGNAL DETECTED ?
NO
YES
560
SLEEP SIGNAL DETECTED ?
550
FIRST WAKE IOC SIGNAL SENT ?
A
YES
NO
B
YES
YES
NO
565
555
IMPLEMENT SET DELAY
570
GENERATE AND TRANSMIT IOC SIGNAL WITH FIRST SET POWER VALUE
CAUSE REMOTE DEVICE TO CHANGE TO SECOND SET POWER VALUE

FIG. 5B

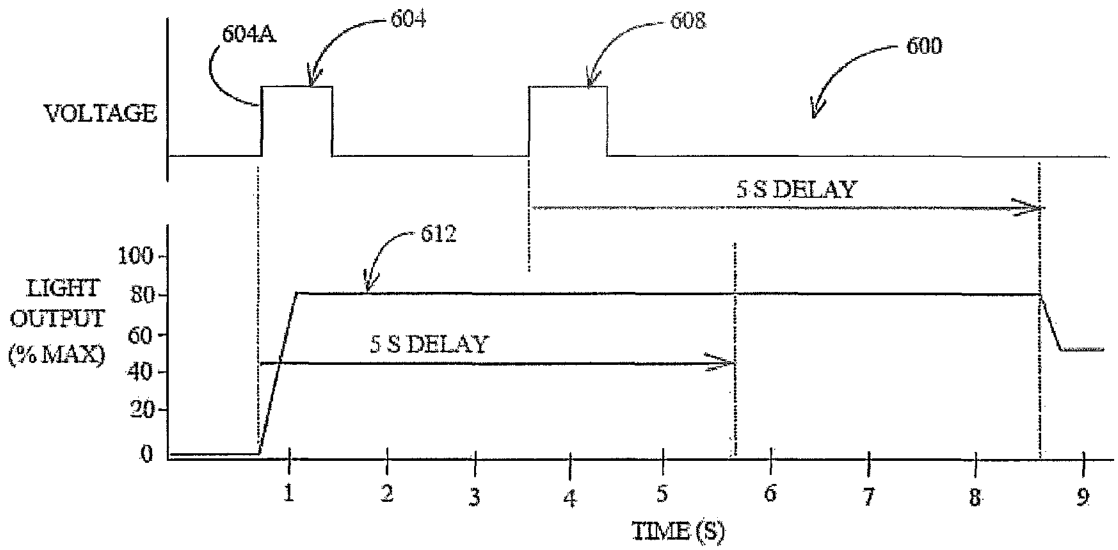

604A
604
608
600
VOLTAGE
5 S DELAY
612
100
LIGHT OUTPUT (% MAX)
80
60
40
20
0
5 S DELAY
1
2
3
4
5
6
7
8
9
TIME (S)

FIG. 6

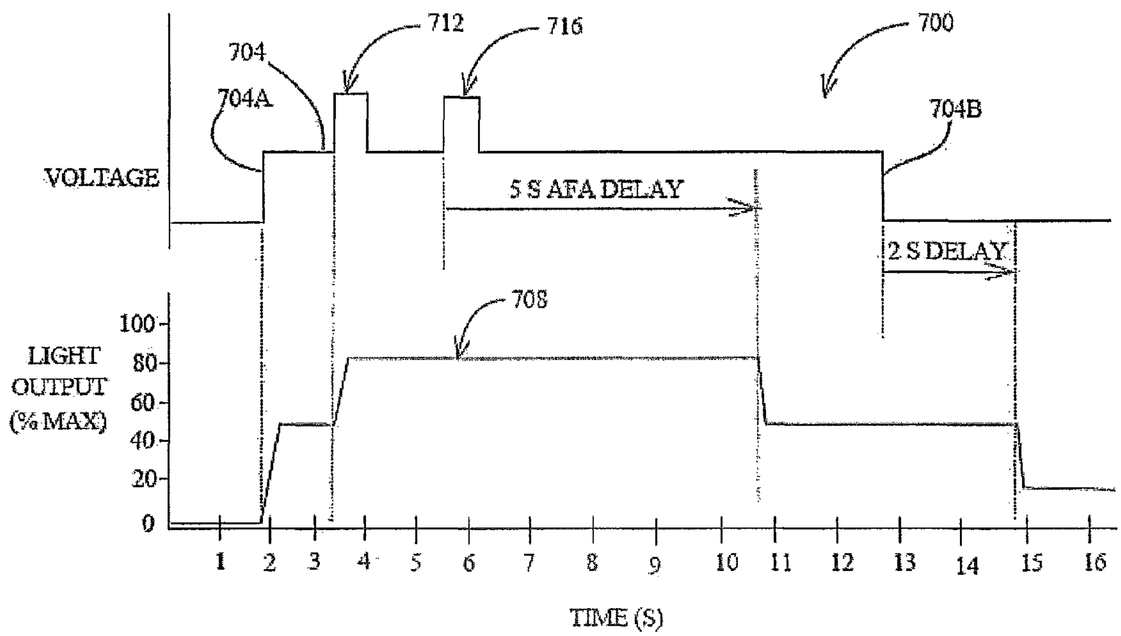

712
716
700
704
704A
704B
VOLTAGE
5 S AFA DELAY
2 S DELAY
708
100
LIGHT OUTPUT (% MAX)
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
TIME (S)

FIG. 7

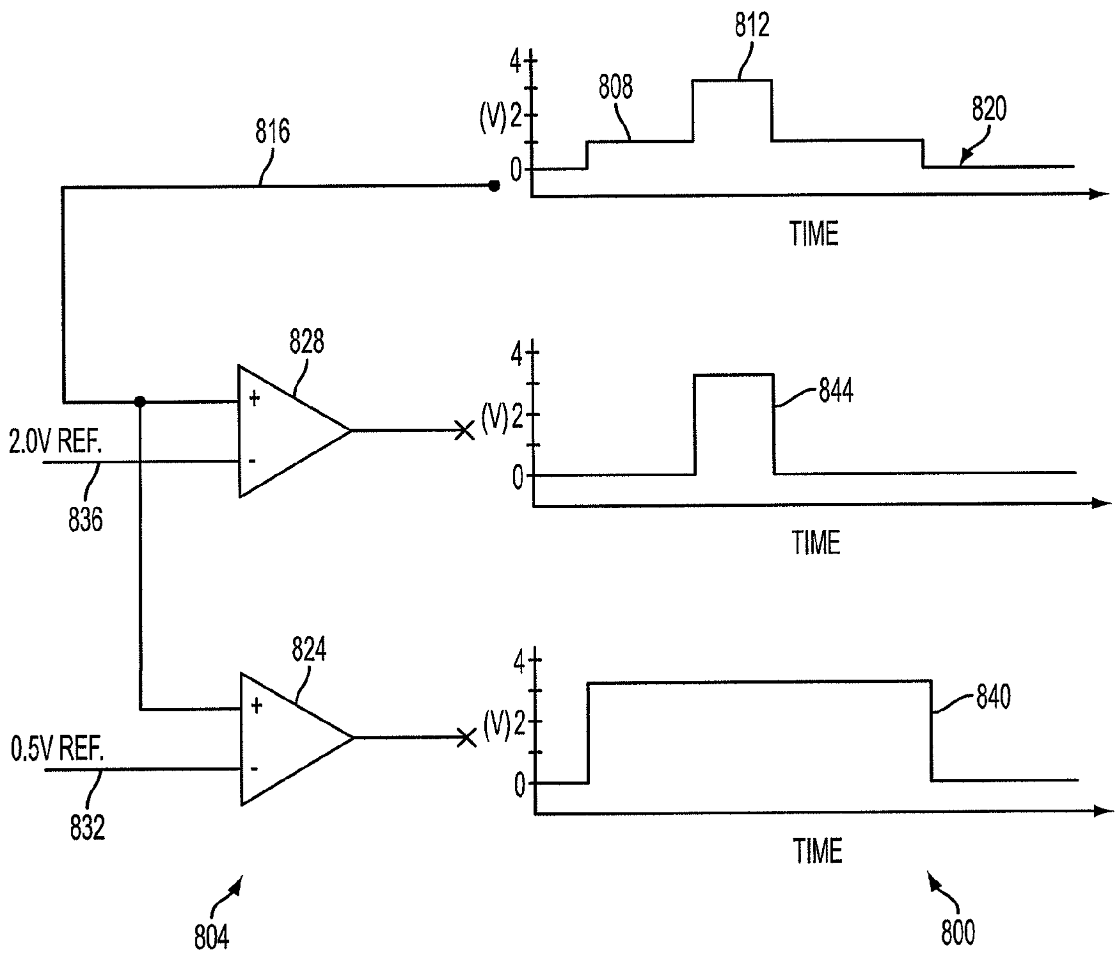
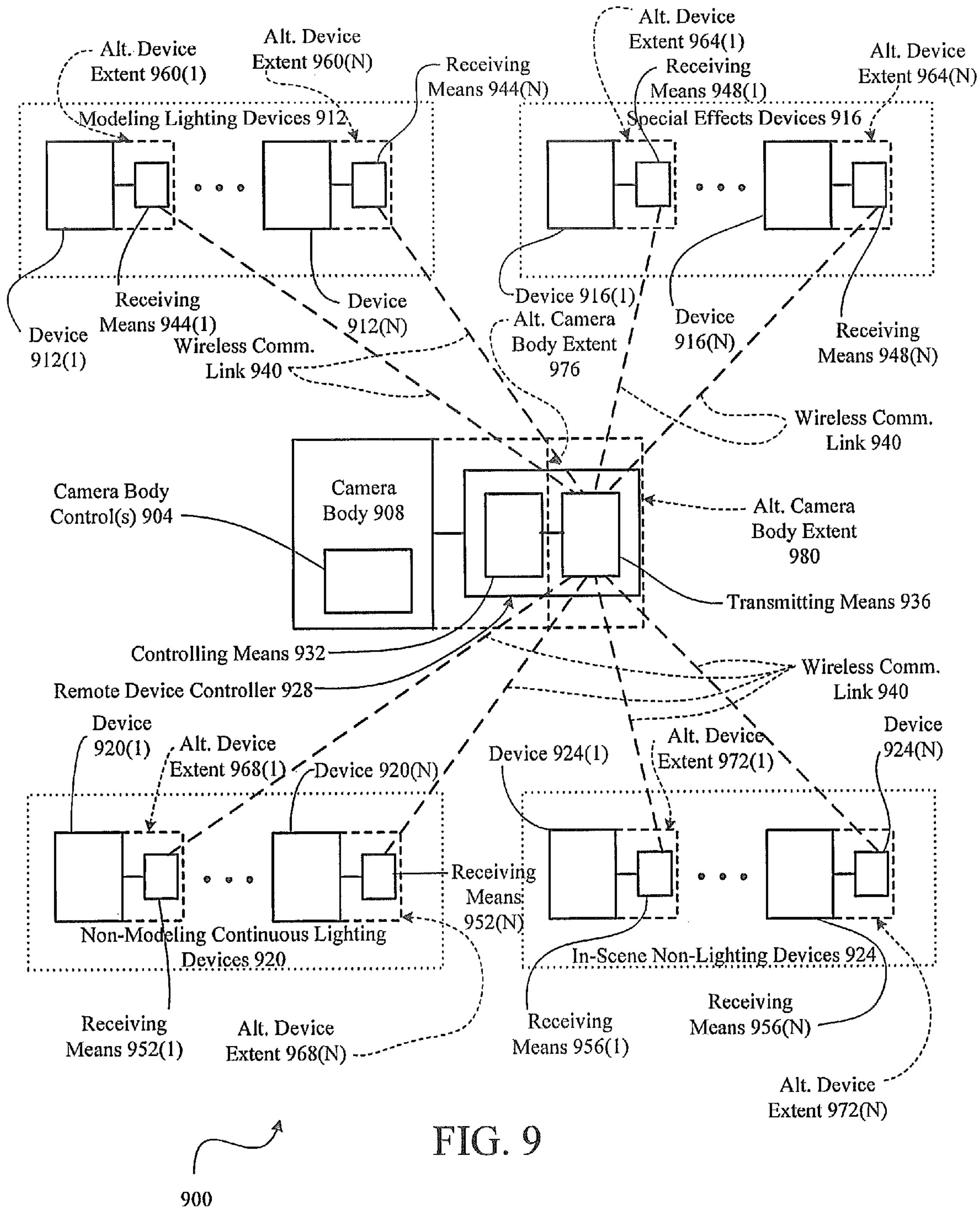

812
808
820
816
4
(V) 2
0
TIME
828
844
2.0V REF.
836
TIME
824
840
0.5V REF.
832
TIME
804
800

FIG. 8



Alt. Device Extent 960(1)
Alt. Device Extent 960(N)
Receiving Means 944(N)
Alt. Device Extent 964(1)
Receiving Means 948(1)
Alt. Device Extent 964(N)
Modeling Lighting Devices 912
Special Effects Devices 916
Device 912(1)
Receiving Means 944(1)
Device 912(N)
Wireless Comm. Link 940
Device 916(1)
Alt. Camera Body Extent 976
Device 916(N)
Receiving Means 948(N)
Wireless Comm. Link 940
Camera Body Control(s) 904
Camera Body 908
Alt. Camera Body Extent 980
Transmitting Means 936
Controlling Means 932
Remote Device Controller 928
Wireless Comm. Link 940
Device 920(1)
Alt. Device Extent 968(1)
Device 920(N)
Device 924(1)
Alt. Device Extent 972(1)
Device 924(N)
Receiving Means 952(N)
Non-Modeling Continuous Lighting Devices 920
In-Scene Non-Lighting Devices 924
Receiving Means 952(1)
Alt. Device Extent 968(N)
Receiving Means 956(1)
Receiving Means 956(N)
Alt. Device Extent 972(N)
900

FIG. 9

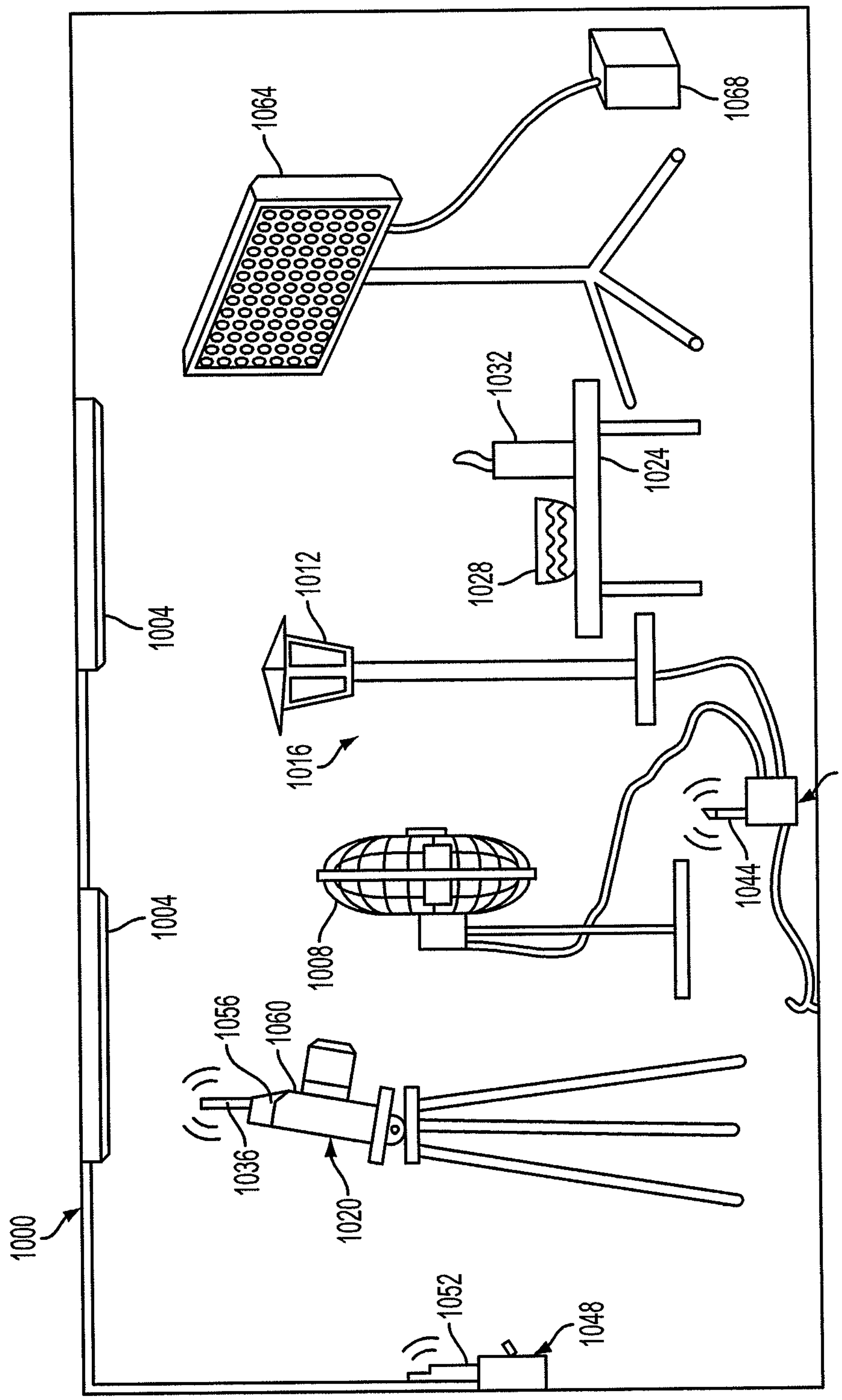

1000
1004
1004
1008
1012
1016
1020
1024
1028
1032
1036
1040
1044
1048
1052
1056
1060
1064
1068

FIG. 10

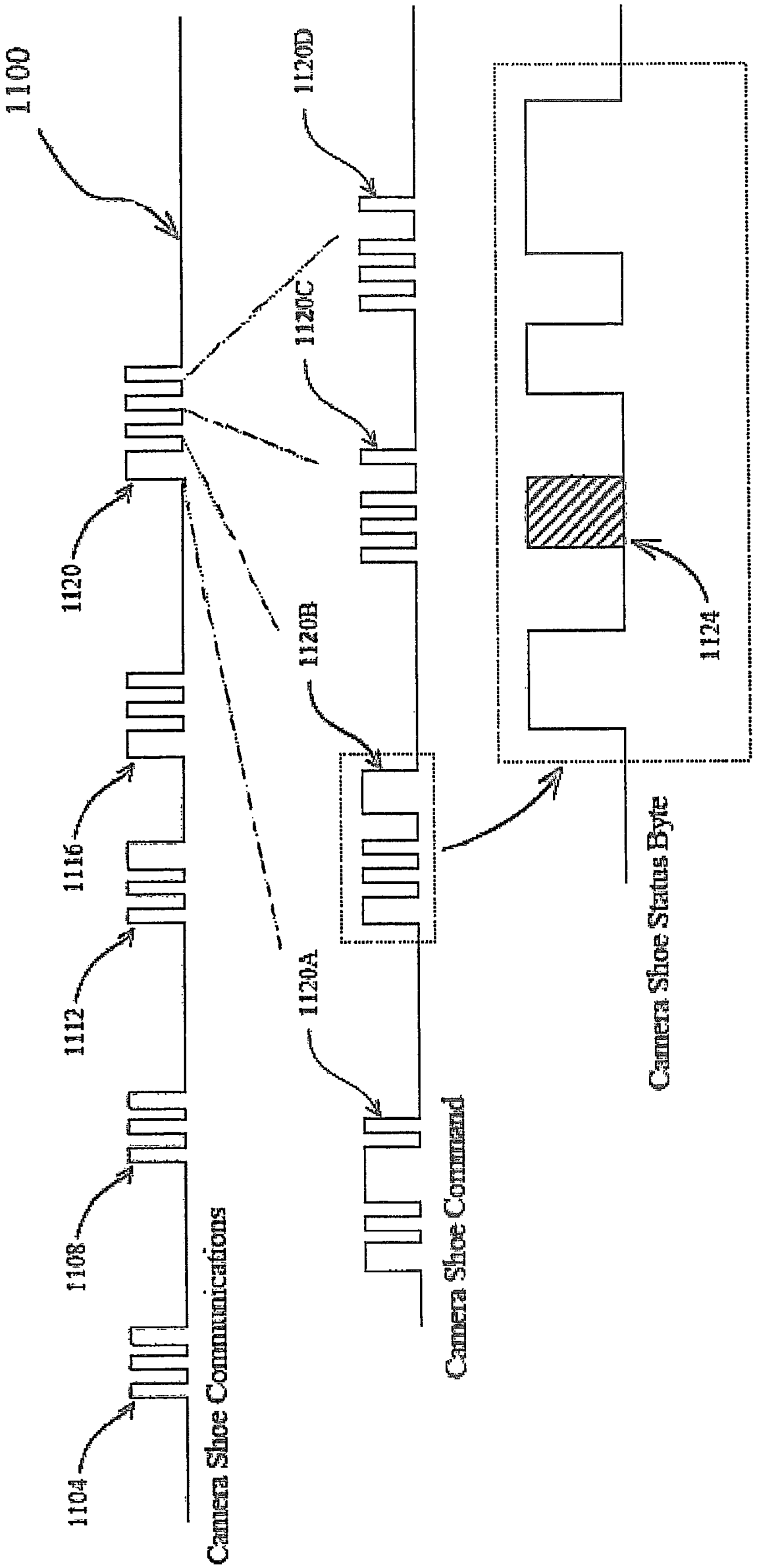

1100
1104
1108
1112
1116
1120
Camera Shoe Communications
1120A
1120B
1120C
1120D
Camera Shoe Command
1124
Camera Shoe Status Byte

FIG. 11

SYSTEMS AND METHODS FOR CONTROLLING A POWER STATE OF A REMOTE DEVICE USING CAMERA BODY BACKLIGHTING CONTROL SIGNALING

RELATED APPLICATION DATA

This application claims the benefit of priority of U.S. Provisional Patent Application No. 61/151,885, filed on Feb. 12, 2009, and titled "Systems And Methods For Controlling A Power State Of A Remote Device Using Camera Body Backlighting Control," which is incorporated here in by reference in its entirety.

FIELD OF THE INVENTION

The present invention generally relates to the field of photography. In particular, the present invention is directed to systems and method for controlling a power state of a remote device using camera body backlighting control.

BACKGROUND

Photography is an integral component of modern society, and photographed images pervade our lives. Photographic images appear, for example, in books, magazines, catalogs, journals, newspapers, billboards, posters and scrapbooks and are displayed in homes, art galleries, retail stores, shopping malls, office buildings and many other places. While many photographic images are acquired using only natural ambient light, many other images are acquired using photographic flash lighting. When image-acquisition flash lighting is used, a photographer often uses one or more modeling lights prior to image acquisition for any of a variety of reasons, such as checking for unwanted shadows, glare, reflection, etc. and/or checking for desired shadows and other lighting effects. Generally, these modeling lights are either kept powered up to a sufficient level or turned up to a sufficient level when needed. Keeping the modeling lighting powered up can be problematic due to the heat this type of lighting generates, which can be uncomfortable for live models and detrimental to heat-sensitive still subjects. Occasionally turning up the power of modeling lighting can be inconvenient, even using more recent remotely-controlled modeling lights.

Many photographic images are acquired without adding special effects to the captured scene. However, many other photographic images are acquired using added special effects, such as artificial wind, snow, mist and rain, and/or using contrived scenes that use in-scene props and other items, such as in-scene lighting. Today, many special effects generators, for example, fans, snow shakers, misters and rain systems, are turned off and on electronically using dedicated on/off and/or speed/power control switches. Similarly, in-scene lighting can often be controlled using such dedicated control switches. Typically, a photographer, or more often a photographer's assistant, has the task of controlling the operation of any special effects devices and in-scene lighting for image acquisition.

In addition, some photographic settings, such as very low-light scenes photographed in a photography studio (or other location having controllable ambient lighting), require ambient lighting to be lowered or turned off during image acquisition so that the ambient light does not interfere with image acquisition. Often, this ambient lighting needs to remain on except for short periods at and around the time of image acquisition because the ambient lighting is necessary for the photographer and any assistants to see while moving around the studio and/or readying the scene for image acquisition. Usually, a photographer or photographer's assistant manually controls the pertinent ambient lighting device(s) using conventional dedicated controls.

SUMMARY OF THE DISCLOSURE

In one implementation, the present disclosure is directed to a method of controlling a power state of a remote device using a camera body. The method includes: detecting a first camera body backlighting control signal; generating a first power state control signal in response to the detecting of the first camera body backlighting control signal, wherein the first power state control signal is configured to change the power state of the remote device; and wirelessly transmitting the first power state control signal to the remote device in response to the detecting of the first camera body backlighting control signal so as to cause the remote device to operate at a first power state.

In another implementation, the present disclosure is directed to a machine-readable storage medium containing machine-executable instructions for controlling a power state of a remote device using a camera body. The machine-executable instructions include: a first set of machine-executable instructions for implementing detection of a first camera body backlighting control signal; a second set of machine-executable instructions for generating a first power state control signal in response to the detection of the first camera body backlighting control signal, wherein the first power state control signal is configured to change the power state of the remote device; and a third set of machine executable instructions for controlling wireless transmission of the first power state control signal to the remote device in response to the detecting of the first camera body backlighting control signal so as to cause the remote device to operate at a first power state.

BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of illustrating the invention, the drawings show aspects of one or more embodiments of the invention. However, it should be understood that the present invention is not limited to the precise arrangements and instrumentalities shown in the drawings, wherein:

For the purpose of illustrating the invention, the drawings show aspects of one or more embodiments of the invention. However, it should be understood that the present invention is not limited to the precise arrangements and instrumentalities shown in the drawings, wherein:

FIG. **1** is a flow diagram illustrating a method of controlling the scene illumination output of one or more modeling lights using a camera body;

FIG. **2** is a diagram of a photographic system that includes a camera, a wireless controller, a remote multifunctional lighting system incorporating a modeling lighting source, and a special effects fan, wherein the system is configured to perform steps of the method of FIG. **1**;

FIG. **3** is a high-level diagram of the wireless controller of FIG. **2**;

FIG. **4** is a diagram illustrating a computer-based environment for configuring a wireless controller, such as the external wireless controller of FIGS. **2** and **3**;

FIGS. **5**A-B together contain a flow diagram illustrating a method of controlling the scene illumination output of modeling lighting using a controller having a wake mode, an autofocus assist mode and a backlight mode, such as the controller of FIGS. **2** and **3**;

FIG. **6** is an example timing diagram illustrating functioning of the autofocus assist mode of a wireless controller, such as the controller of FIGS. **2** and **3**, using the control settings illustrated on the screen of the graphical user interface of FIG. **4**;

FIG. **7** is an example timing diagram illustrating functioning of the wakeup mode of a controller, such as the controller of FIGS. **2** and **3**, using the control settings illustrated on the screen of the graphical user interface of FIG. **4**;

FIG. **8** is a diagram illustrating circuitry and corresponding signaling suitable for use in the camera body interface of a controller, such as the controller of FIGS. **2** and **3**;

FIG. **9** is a high-level diagram illustrating a flexible control system for controlling a host of devices, including modeling lighting devices, special effects devices, non-modeling continuous lighting devices and in-scene non-lighting devices, using one or more camera body controls of a camera body;

FIG. **10** is an elevational view of a photography studio containing a photographic system that includes a camera, ambient lighting devices and an in-scene lighting device, wherein the system is configured to allow a photographer to control operation of the ambient lighting devices and in-scene lighting device using the body of the camera; and

FIG. **11** is a diagram illustrating a digital camera-body-status communication signal containing autofocus assist and backlight information that a controller of the present disclosure can use to control one or more modeling lighting device(s).

DETAILED DESCRIPTION

Referring now to the drawings, FIG. **1** illustrates a method **100** of changing a power state of a remote device using camera body backlighting control. As will be readily understood by those skilled in the art after reading this entire disclosure, a control method containing broad concepts disclosed herein, such as method **100**, is useful for a number of purposes, including: allowing a photographer to use modeling lighting to check for unwanted and/or wanted lighting effects and levels that will appear in images captured using flash photography; allowing a photographer to control operation of remote special effects; allowing a photographer to control ambient and in-scene lighting; allowing a photographer to control remotely controllable devices appearing in a photographic scene; and any combination thereof, all without having to remove an eye from the camera's viewfinder or live-view display. Such a control method also allows for use of modeling lighting to provide light for assisting a camera in carrying out its autofocus functionality.

Method **100** typically begins at step **105** by detecting a camera body backlighting signal. As used herein and in the appended claims, the term "camera body backlighting signal" and like terms mean a signal generated either internally or externally relative to the camera body and that is used to control backlighting of one or more displays, such as one or more LCD (and/or other type of electronic display technology) camera settings/information panel, a live-view display, and any combination thereof. A camera body backlighting signal can be, for example, a signal generated by a backlighting control switch located on the camera body, a backlighting control switch located off of the camera body but provided to the camera body (e.g., via a port on the camera body), a signal generated by a microprocessor or other circuitry onboard the camera body in response to actuation of a backlighting control switch located either on or off of the camera body. Such a camera body backlighting control signal can be an analog signal, a digital signal or a combination of an analog and digital signal. In addition, such a camera body backlighting control signal can be a turn-on or a turn-off signal and can be in response to user actuation of a control (e.g., hard or soft switch) and/or in response to a timing out of a timer on a preset delay.

A camera body backlighting control signal can be detected either internally or externally relative to camera body, depending on the configuration of the corresponding system. Examples of ways a camera backlighting control signal can be detected internally include detection on a switch signal path between a backlighting control (such as a hard switch, e.g., a button) and a microprocessor or other circuitry located onboard the camera body and detection on a signal path downstream of any microprocessor or other circuitry. An example of the former is when a switch signal is used directly as the camera body backlighting control signal, and an example of the latter is when an internally generated "interpretive" camera body backlighting control signal is generated in response to a "raw" switch signal. For example, an interpretive camera body backlighting control signal can occur when a built-in microprocessor or other built-in circuitry responds to a raw camera body backlighting switch signal by generating a camera body backlighting control signal that is communicated to backlighting control circuitry and/or other circuitry, such as camera-body hotshoe circuitry. In this connection, it is noted that some contemporary camera bodies make camera body backlighting control signaling available at their hotshoes for the purpose of controlling backlighting on hotshoe-mounted strobe (flash) devices in concert with backlighting on the camera bodies themselves.

Once a camera body backlighting control signal is detected at step **105**, at step **110** a first power state change signal is generated in response to the detection of the camera body backlighting signal. Like detecting step **105**, generating step **110** can be performed internally or externally relative to the camera body, depending on the configuration of the overall control system. For example, if a particular camera body includes an internal controller, generating step **110** can be performed internally. In another example in which a controller is provided externally to a camera body, generation step **110** is performed outside the camera body. As will become apparent from the detailed examples provided below, the first power state change signal can be, for example, a signal recognizable directly by the target, i.e., controlled, device(s) or recognizable by an intermediate device, such as a wireless receiving device that, in turn, generates one or more signals recognizable by the controlled device(s). The relevant signaling depends on the overall configuration of the system. As will also be discussed below, the first power state change signal may be accompanied by and/or contain data, such as one or more power level values and/or a power state change time delay value for a subsequent power change, among others. Examples of such data are described below in the detailed examples.

At step **115** the first power state control signal is wirelessly transmitted so as to cause one or more controlled devices to operate at a first power state, or remain operating at the first power state if the device(s) was/were already operating at the first power state when it/they wirelessly received the first power state control signal. As those skilled in the art will readily appreciate, the term "power state" is used generically to account for the diversity of devices that can be controlled using a method of the present disclosure. As discussed below in greater detail, examples of such devices include, but are not necessarily limited to, modeling lighting devices, special effects devices, in-scene lighting devices and in-scene non-lighting devices. Consequently, the term "power state" refers to such states as "on," "off," a particular illumination output level (for lighting devices such as modeling lighting devices, ambient lighting devices, in-scene lighting devices, etc.), a particular speed (such as for special effects devices and in-scene non-lighting devices, e.g., wind generators, snow shakers, etc.) and a particular operating output level (such as amounts of simulate rain, fog, mist, etc.), among others.

As alluded to above relative to generating step **110**, the way the controlled device(s) are caused to operate at the first power state depends on the configuration of the overall control system. For example, if a particular controlled device has user-settable power levels settings that can be input wirelessly, then the system can be configured, for example, so that the power state change signal contains a desired power level setting. In another example, if a particular controlled device has user-settable power level settings that can be input only either through an onboard user interface on the device or through a wired port on the device, then the system may include two wireless devices, a first one at the camera body and a second one connected to the wired input port of the controlled device. In one scenario, the first wireless device at the camera body may transmit a simple remote-device trigger signal to the second wireless device at the controlled device. In this case, upon receiving the trigger signal the second wireless device would, for example, send the illumination output level setting. If multiple controlled devices are being controlled at the same time via wireless devices, each of these devices may have a unique identifier that a properly configured system can utilize to implement differing control schemes among the multiple devices. Detailed examples of ways of implementing transmitting step **115** are presented below.

After each controlled device has been set to the first power state at step **115**, at additional step **120** each controlled device is caused to change from the first power state to a second power state, which will typically be different from the first power state. The way that step **120** can be accomplished varies, for example, with the overall system configuration and capability of the controlled device(s). For example, if a particular controlled device has a built-in timer that is wirelessly settable with a delay and that device is able to change its power state when the timer times-out on the delay, then the transmission of the first power state control signal at step **115** can be accompanied not only by a desired state settings (e.g., power level, "on" setting, "off" setting, etc) for the first power state but also by a delay value and a desired powered state setting for the second power state. Then, when the built-in timer times-out on the set delay, that controlled device automatically changes from the first power state to the second power state. In another example wherein a controller at the camera body has a timer and the controlled device at issue is responsive to power state control signals containing corresponding respective power output settings, at step **115** the controller sends the first power state control signal containing a power level setting for the first power state and then sets its internal time to the desired delay. Then, when the controller's timer times-out on the set delay, at step **120** the controller sends a second power state control signal containing a power output setting for the second power state.

A further example includes two wireless communications devices and a controlled device that has settable power states and a settable delay, but only through a wired port. In one scenario, at step **115** a first one of the wireless communications devices at the camera body sends the first power state control signal to a second one of the wireless devices at the controlled device. When the second wireless communications device at the controlled device receives the first power state control signal, it then loads first and second power state settings and delay value into the controlled device, and the controlled device uses this data to control the first and second power states. In this example, step **120** is performed by the various aspects of the sending of the original, or first, power state signal, the loading of the delay and second power state setting by the second wireless device and the response of the controlled device to the set delay and second power output level. In a dual wireless communications device scenario other variations include, but are not limited to, the first device including the delay timer, the second device including the delay timer, the first device being programmed with desired power state settings and delay value and the second device being programmed with desired power state settings and delay value. Those skilled in the art will readily appreciate that there are numerous possible scenarios for performing step **120** and that a description of all of these scenarios is not needed for those skilled in the art to implement the broad concepts disclosed herein in any of the possible scenarios based on the present disclosure. Several particular examples of possible scenarios are described below in detail.

FIG. **2** illustrates an exemplary photographic system **200** that is configured to carry out the steps of method **100** of FIG. **1**. Referring to FIG. **2**, and also to FIG. **1**, photographic system **200** includes a camera body **204** and two continuous type modeling lighting apparatuses, namely, a multifunction lighting system **208**, which includes a continuous modeling light, and a dedicated modeling lighting device **212**. In this example, each modeling lighting apparatus **208**, **212** is controllable from camera body **204** via a controller **216** mounted to a hotshoe **220** on the camera body. As described below in detail, controller **216** is configured to control the modeling lighting functionality of multifunction lighting system **208** in one, the other, or both of a wake mode and an autofocus assist mode, depending on a user's preference, and to control modeling lighting device **212** in a backlight control mode. Briefly, wake mode of controller **216** uses a camera body wake signal and a corresponding camera body sleep signal each generated by camera body **204** to control scene illumination output levels of continuous type modeling lighting of multifunction lighting system **208**. The wake signal may be generated by any of a variety of controls on camera body **204**. However, a very useful control for a photographer to use to initiate the wake signal is a shutter release button **224** on camera body **204**, a partial press (commonly referred to as a "half press") of which causes the camera body to generate a wake signal. The corresponding sleep signal is typically automatically generated by camera body **204**, for example, by an internal microprocessor, after a preset time following release of the shutter release or other control.

Autofocus assist (AFA) mode of controller **216** uses a camera body autofocus assist signal generated by camera body **204** to control scene illumination output levels of the modeling lighting of multifunction lighting system **208**. In this example, camera body **204** is configured to generate an autofocus assist signal in two ways, a first in response to a user pressing an autofocus ("AF") button **228** located on the camera body within ready reach of a photographer's thumb and a second in response to the camera body (via autofocus circuitry (not shown)) determining that a lens **232** attached to the camera body needs to be actuated to bring the scene into focus. The generation of camera body autofocus assist signals in both of these manners is well known in the art such that further description is not necessary herein for those skilled in the art to implement the broad concepts disclosed herein.

In this example, backlight (B/L) mode of controller **216** uses a camera body **204** backlighting control signal generated by camera body to control scene illumination output levels of modeling lighting device **212**. In this case, camera body **204** includes a backlighting control switch **236** that a user uses to turn backlighting of one or more displays, such as LCD display panel **240**, on the camera body on and off as desired. It is noted that differing camera body models have differing ways of handling backlighting functionality and signaling. For example, some current camera body models have on-actuators like backlight control button **236**, whereas others have on-switches. In most current camera bodies, each type of actuator is used in conjunction with a built-in timer used to control when the camera body turns the backlighting off. In addition, some current camera body models make the camera body backlighting signaling available at the hotshoe of the camera body, whereas others do not. As will be seen below, camera body **204** of FIG. **2** is of the type that makes camera body backlight signaling available at hotshoe **220**. Camera body **204** is also configured like many conventional camera bodies to make camera body wake (and sleep) and autofocus assist signals available at hotshoe **220**. Further details of wake, AFA and B/L modes of controller are described below in greater detail after a description of multifunction lighting system **208** and modeling lighting device **212**.

In this example, multifunction lighting system **208** includes a dual function lighting head **244** that provides both image acquisition strobe light from a flash source **248** (such as a xenon flash tube) and continuous light from a continuous light source **252** (such as a tungsten bulb). Lighting head **244** is powered by a suitable generator pack **256**. A similar multifunctional lighting system is available from Profoto, Stockholm, Sweden, among other photographic lighting manufacturers. Generator pack **256** includes a built-in wireless communications device **260** and an onboard microprocessor (not shown) responsive to a relatively robust set of user-settable lighting control parameters, including modeling lighting control parameters. Parameters for operating multifunction lighting system **208** that a user is able to set/control using wireless communications device **260** include illumination output level settings. In this example, wireless communications device **260** implements a pair of illumination level change delay settings. The use of these parameters and settings is described below in greater detail.

Wireless communications device **260** is in wireless RF communication with controller **216** so as to receive one or more instructions (sets) for controlling the operation of multifunction lighting system **208**. In this connection, wireless communications device **260** includes an RF receiver (not shown). In other embodiments, wireless communications device **260** may also include an RF transmitter or, alternatively to separate RF receiver and transmitter, an RF transceiver. It is noted that in yet other embodiments, wireless communications may be implemented using another communication technique, such as visible-light communication (e.g., using a strobe attached to controller **216**) and infrared communication, among others.

When an instruction (of instruction set, depending on the communication protocol) containing a power level setting is received by the built-in microprocessor of generator pack **256** (for example via built-in wireless communications device **260**, an external port **264** or a built-in user interface **268**), the onboard microprocessor changes the output illumination level of continuous light source **252** to the setting provided in that instruction (set). If a delay value is not also provided with the instruction (set), continuous light source **252** will stay at the new setting until the microprocessor receives another power state instruction, such as another illumination output setting or a power-off instruction. However, when the onboard microprocessor of generator pack **256** receives an instruction (set) containing first and second power level settings and a delay setting, the built-in microprocessor first changes the illumination output of continuous light source **252** to the first power level setting, holds the illumination output for the delay setting and then changes the illumination output to the second power level setting. The power level setting may be expressed in any convenient form, such as percentage of maximum output power, absolute input power or absolute output power, among others. The delay setting may also be expressed as any convenient value, such as number of seconds, minutes or other predefined periods.

In this example, modeling lighting device **212** is a standalone modeling lighting device that utilizes a continuous light source (on hidden side of device **212**, but such as a tungsten bulb, a light-emitting diode (LED) or an array (panel) of LEDs) to provide continuous light at a user-selectable illumination output level. Such a modeling lighting device is available from Elinca, Geneva, Switzerland, among other photographic lighting manufacturers. Modeling lighting device **212** includes an onboard controller (not shown) that can be set to any one of various illumination output levels via either of an integrated user interface **270** and a wired communications port **272**. Because modeling lighting device **212** does not have a built-in wireless communications device like generator pack **256**, the modeling lighting device is supplemented with an external RF wireless communications device **276** that is in wired communication with wired communications port **272** of the device. In this example, modeling lighting device **212** is configured to be toggled between two user-preset illumination output levels set by a user via integrated user interface **270** in response to it receiving a certain trigger signal. Consequently, wireless communications device **276** is in wireless RF communication with controller **216** so as to receive first and second IOC signals (which may be the same as one another) that cause wireless communications device **276** to provide each certain toggling trigger signal to modeling lighting device **212**. In this connection, wireless communications device **276** includes an RF receiver (not shown). In other embodiments, wireless communications device **260** may also include an RF transmitter or, alternatively to separate RF receiver and transmitter, an RF transceiver. It is noted that in yet other embodiments, wireless communications may be implemented using another communication technique, such as visible-light communication (e.g., using a strobe attached to controller **216**) and infrared communication, among others.

In this example, wireless RF communications among controller **216**, wireless RF communications device **260** of generator pack **256** and wireless RF communications device **276** of modeling lighting device **212** includes the ability of each of these devices to distinguish signaling meant for it from signaling meant for any other device. This can be accomplished in any of a variety of ways, such as by each device having a unique address and including in each transmission the unique address(es) of the device(s) intended to receive a particular transmission. Further detail of such signaling techniques is beyond the scope of this disclosure and is not needed for those skilled in the art to implement such techniques, since they are known in the art.

As those skilled in the art will readily appreciate, hotshoe **220** has a number of electrical contacts (not shown) for communicating various signals to and/or from an accessory, typically a flash device or strobe-controlling radio, mounted to the hotshoe. In this example, camera body **204** is of a type that outputs a camera body wake/sleep signal(s) via one of the pins, denoted the first pin, and outputs a camera body autofocus assist signal via the same first pin. Also in this example, the camera body wakeup signal is characterized by a first voltage change, here from a low level to an intermediate level, the camera body sleep signal is characterized by a second voltage change, here from the intermediate level to the low level, and camera body autofocus assist signal is identified by a third voltage change, here from the intermediate level to a high level. This example is discussed further below in connection with FIGS. **6** and **7**. Further, in this example the camera body backlight control signal appears on a second pin different from the first pin and is identified by an increase in voltage from a low voltage to a higher voltage that is held high while the backlighting is to be on. It is noted that some current camera bodies, such as EOS-series SLRs/DSLRs available from Canon, Inc., Tokyo, Japan, do not provide backlight signals externally through a hotshoe, whereas other current camera bodies, such as SLRs/DLSRs available from Nikon Corporation, Tokyo, Japan, provide backlight on/off information via a status bit in a digital communications bit cluster, for example to allow the camera-body backlighting control signal to control backlighting on a flash unit mounted to the hotshoe. Other camera bodies can have different backlighting signaling arrangements, such as the one illustrated in FIGS. **6** and **7**.

Another characteristic of this example is that backlight control mode is of a non-delay-type. That is, the camera body backlighting stays on until a user turns it off, here, using backlighting control button **236**. Consequently, when a user activates camera body backlight control button **236** to turn camera body backlighting on, controller **216** is configured to cause a first illumination output change in modeling lighting device **212**, here from off to on. (In this example, the photographer wants modeling lighting device **212** to be on when the backlighting of camera body **204** is on. However, there may be other situations when the photographer might want modeling lighting device **212** to be off when backlighting of camera body **204** is on. These differing options are described in more detail below.) Then, when the user activates backlight control button **236** again to toggle the camera body backlighting off, controller **216** is configured to cause a second illumination output change in modeling lighting device **212**, here from on to off. Further details of this control scheme are provided below.

In the current embodiment, controller **216** is not (though it could be) part of a hotshoe-mountable flash device that is fully compatible with camera body **204** (i.e., is able to use any signaling camera body **204** makes available via hotshoe **220**), although such a flash device (not shown), or other flash or non-flash device, may indeed be mounted on the controller via an auxiliary hotshoe **280** that has the same signals available as the signals available at hotshoe **220**. Nonetheless, in this example, controller **216** is configured to utilize some of the same information that camera body **204** normally provides to a compatible flash device via hotshoe **220**. Often, however, conventional camera bodies do not provide their hotshoes with any signaling, i.e., wake, sleep, autofocus assist, backlighting, etc., if they do not recognize that a compatible device has been engaged with the hotshoe. Consequently, in such cases, wireless controller **216** can be configured with an appropriate system for causing camera body **204** to provide the needed signals. U.S. patent application Ser. No. 12/129,402 filed on May 29, 2008, and titled "System and Method For Maintaining Hot Shoe Communications Between A Camera and A Wireless Device," discloses such systems and is incorporated herein by reference for all of its teachings on these systems.

Referring now to FIG. **3**, and also to FIG. **2**, in this example controller **216** includes, among other things, a microprocessor **300**, a hotshoe connector **304**, a camera body signal interface **308**, memory **312**, an external communications port **316**, an RF transmitter **320** and an antenna **324**. It is emphasized at this point, and will be recognized by those skilled in the art that the components of this example and their arrangement are presented for the sake of illustration and not limitation. Skilled artisans will understand that given the wide range of technologies available for implementing the overarching functionality disclosed herein, there are many ways of implementing this functionality. For example, while the various parts of controller **216** are shown as components discrete from one another, any two or more of the parts can be integrated onto a single integrated circuit chip, for example, as a system on chip. Similarly, various ones of the differing parts can be integrated with one another. For example, any memory provided may be partially or completely integrated with, for example, the microprocessor.

Further variations include the fact that RF transmitter **320** and corresponding antenna **324** can be replaced by another type of transmitting system, such as an infrared or visible light transmitter. An analog of the latter is a hotshoe mounted strobe device capable of sending data wireless to a remote strobe device using specially timed pulsed emissions from a flash tube. In still further variations, the parts of controller **216** provided to enable its functionality externally relative to a camera body, such as camera body **204** of FIG. **2**, can be eliminated and most of the remaining parts adapted for location inside a camera body, except perhaps for an antenna, strobe, or other wireless signal transmitting device. In the case of putting the functionality of a controller of the present disclosure, such as controller **216**, into a camera body, this can be accomplished by retrofitting an existing camera body or by designing the functionality into a new camera body design prior to production. In the latter case, any microprocessor(s)/circuitry used for the modeling lighting control functionality disclosed herein could be the same microprocessor(s)/circuitry that controls conventional camera functionalities. In yet other variations, any microprocessor/software implementation envisioned herein could be replaced by a purely hardware implementation at the choice of the designer. It is also noted that depending on the nature of the particular controller, the transmitter could be supplemented with a receiver, or both could be replaced by a transceiver without departing from the spirit of the embodiments disclosed and intended to be covered by the appended claims.

Returning now to the illustrative example, microprocessor **300** performs a host of functions including, but not limited to, executing machine-executable instructions **326** (e.g., firmware stored in memory **312**), communicating with camera body interface **308**, controlling/communicating with communications port **316**, controlling/communicating with transmitter **320** and providing wireless controller **216** with its unique functionality. Camera body interface **308** receives signals from a camera body, such as camera body **204** of FIG. **2**, for example via hotshoe **220**, and transforms those signals as needed for use by microprocessor **300**. Signals that camera body interface **308** is configured to transform in this example are a camera body wake/sleep signal, a camera body autofocus assist signal and a camera body backlight signal. An example of circuitry suitable for use in camera body interface **308** when these signals are analog voltage signals is described below in connection with FIG. **8**. It is noted, however, that not all camera systems use analog signals to communicate information such as wake, sleep, autofocus assist, and backlight on/off externally from the camera body. Other camera systems handle such communication digitally, for example, using digitally encoded signals. In such cases, the camera body interface may simply be a data link to the microprocessor. Yet other camera systems may implement a hybrid approach wherein one or more signals are analog and one or more signals are digitally encoded. In the context of a microprocessor-based controller, the camera body interface would be configured to handle both types of signaling.

As alluded to above, memory **312** is used generically in FIG. **3** to denote any and all types of memory in communication with controller **216**, including BIOS memory and RAM, among others, that are, as mentioned above, integrated into microprocessor **300** and/or provided externally to the microprocessor. Memory **312** contains information wireless controller **216** needs to perform its functionality, such as, but not limited to: machine-executable instructions **326** for enabling the functionality of the controller; controller setup data; controlled modeling light device parameter settings (such as illumination output levels and delay values); controlled device instructions (sets); and communications settings, e.g., transmit (and receive) frequencies, device identification codes, etc., among other things. Those skilled in the art will understand all of the various types of information that can/needs to be stored in memory **312** to make controller **216** a device that functions according to the concepts disclosed herein.

Continuing with this illustrative example, external communications port **316** is provided for transferring information to and from controller **216**. This allows a user to custom configure controller **216** and provide any needed operational settings for a particular application of the controller. In the present example, communications port **316** is a USB port. However, any other type of communications port, including a wireless port (e.g., Bluetooth, IEEE 802.11, etc.), can be provided in place of or in addition to USB port **316**. In this connection, FIG. **4** illustrates controller **216** in an information transfer environment **400**. In this example, controller **216** is connected to a suitable programming device, such as laptop computer **404** shown, via a USB cable **408** (since in this example external communications port **316** is a USB port). Laptop computer **404** provides a convenient vehicle for presenting to a user a graphical user interface (GUI) **412** of a software application (not shown, but running on the laptop computer in a conventional manner) designed for interacting with controller **216**. GUI **412** is shown presenting a screen **416** that allows a user to select which mode(s) of device control operation the user desires to enable and also allows a user to set the appropriate parameter(s) for each of the selected modes.

It is noted that the example shown in FIG. **4** is simply that, exemplary. In other implementations the programming of a controller made according to the present disclosure can be accomplished in any one or more of a number of ways. For example, the controller can be provided with a user-interface, such as an LCD screen and one or more buttons or other input devices, a touchscreen, etc. that allow a user to program the controller. In other implementations, control parameter values for the controller can be set with one or more mechanical buttons, switches and/or dials, etc. In yet other implementations, control parameter values can be set wirelessly, for example, using a wireless port as mentioned above. In such a case, the programming device could be a smartphone (e.g., BlackBerry device, iPhone device), PDA, laptop computer, desktop computer, dedicated programming device, etc. Those skilled in the art will understand and appreciate the variety of ways that a controller of the present disclose can be programmed with desired control parameter values, if the controller is not preset with the desired values or is not programmable.

As mentioned above, in the present example, controller **216** is configured to have control functionality based on camera body wake signals ("Wake" mode **420**), camera body autofocus assist signals ("AF Assist" mode **424**) and camera body backlight controls signals ("Backlight" mode **428**). Correspondingly, GUI **412** provides three primary selection controls (here a common GUI-type checkboxes **432**A-C) corresponding respectively to the three modes **420**, **424**, **428**. As will be seen below, a user can select any one, any two or all three of these modes **420**, **424**, **428**, as desired.

If a user selects checkbox **432**A indicating Wake mode **420**, the wake mode parameter selection input fields **436**A-C become active. In this example, Wake mode selection fields **436**A-C are for inputting three desired values, respectively: 1) a first illumination output level, in this example the illumination output level to which to change the modeling lighting of multifunctional lighting system **208** (FIG. **2**) as a function of controller **216** detecting a camera body wake signal; 2) a second illumination output level, here the illumination output level to which to change the modeling lighting of the multifunctional lighting system from the first illumination output level; and 3) a delay value used to determine when to cause the second illumination output level change. In this example, illumination output levels are expressed as a percentage of the maximum illumination output and the delay value is expressed in seconds.

If a user selects checkbox **432**B indicating AF Assist mode **424**, the autofocus assist parameter selection input fields **440**A-C become active. In this example, autofocus assist mode selection fields **440**A-C are for inputting three desired values, respectively: 1) a first illumination output level, in this example the illumination output level to which to change the modeling lighting of multifunctional lighting system **208** (FIG. **2**) as a function of controller **216** detecting a camera body wake signal; 2) a second illumination output level, here the illumination output level to which to change the modeling lighting of the multifunctional lighting system from the first illumination output level; and 3) a delay value used to determine when to cause the second illumination output level change. In this example, illumination output levels are expressed as a percentage of the maximum illumination output and the delay value is expressed in seconds.

If a user selects checkbox **432**C indicating Backlight mode **428**, a pair of parameter selection checkbox controls **444**A-B become active. In this example, Backlight mode **428** has two sub-modes **448**A-B. In first sub-mode **448**A, the controlled device (here, modeling lighting device **212** (FIG. **2**)) is turned on when a user turns on the camera body backlighting and is turned off when the user turns off the camera body backlighting. In second sub-mode **448**B, the controlled device is turned off when a user turns on the camera body backlighting and is turned on when the user turns off the camera body backlighting. It is noted that in alternative embodiments each of first and second sub-modes **448**A-B may be provided with power level fields similar to the power level fields of Wake and AF Assist modes **420**, **424**. However, in this example, modeling lighting device **212** (FIG. **2**) is either switched on or off, so no power levels need to be set. Rather, the on- and off-signaling from controller **216** to modeling lighting device **212** will be handled properly depending on which sub-mode **448**A-B is selected. That is, if first sub-mode **448**A is selected, the software application running on laptop computer **404** configures controller **216** to send an on-signal to wireless communications device **260** (FIG. **2**) when a user turns on the backlighting of camera body **204** and to send an off signal to that wireless communications device when the user turns off the camera body backlighting. The opposite is true of second sub-mode **448**B. In another alternative in which the power state change is binary, i.e., off-on-off or on-off-on, GUI **412** may be provided with two power level fields (not shown) corresponding to the two changes. These fields may be identical to fields **436**A-B, **440**A-B of, respectively, Wake mode **420** and AF Assist mode **424**. Then, if a user wants off-on-off functionality, the user would input 100% power for the first power level change (corresponding to the off-on transition) and 0% power for the second power level change (corresponding to the on-off transition). Of course, other alternatives are possible.

FIGS. **5**A-B illustrate a flow diagram illustrating one possible method **500** of controlling controller **216** so as to provide the controller with the functionality illustrated via GUI **412** of FIG. **4**. As those skilled in the art will readily appreciate, method **500** can be implemented in software, in analog circuitry and in any combination thereof. At step **505** method **500** begins. Depending on the power state of controller **216**, step **505** may begin when the controller is first powered on and, if the controller has wake and sleep states to control power consumption, every time the controller is woken up. At step **510** the controller determines (or already knows) whether or not AF Assist (AFA) mode **424** is enabled. As discussed above relative to GUI **412** (FIG. **4**), AF Assist mode **424** may be enabled during an appropriate setup procedure, for example, by a user checking checkbox **432**B in the GUI with controller **216** in communication with laptop **404**. If AF Assist mode **424** is not enabled, method **500** continues to step **515** wherein controller **216** checks to determine whether Wake mode **420** has been enabled, for example, in a manner similar to AF Assist mode **424**.

However, if at step **510** controller **216** determines (or knows) that AF Assist mode **424** is enabled, then method **500** proceeds to step **520** at which the controller determines whether or not it has detected an AFA signal generated by camera body **204** (FIG. **2**). If controller **216** has not detected camera body AFA signal, method **500** simply proceeds to step **515** to determine whether Wake mode **420** is enabled. On the other hand, if controller **216** has detected a camera body AFA signal, at step **525** controller **216** generates and transmits an illumination output change signal. In this example, since generator pack **256** (FIG. **2**) of multifunction lighting system **208** has built-in wireless communication device **260** and is responsive to instructions containing illumination level settings, step **525** includes transmitting the first change level set in field **436**A of GUI **412**. In this example, controller **216** transmits the first change level signal as soon as possible after it detects the camera body AFA signal.

At step **530** controller implements the delay set in field **436**C of GUI **412**. In this example, generator pack **256** has an internal timer and is responsive to wirelessly received instructions that include delay values. Consequently, in one example when controller **216** transmits the IOC signal along with the first illumination level at step **525**, at the same time it transmits the set delay value. Those skilled in the art will understand that other implementations can utilize a timer function built into the controller. At step **535**, controller **216** causes the modeling light to change to the second change level set in field **436**B of GUI **412**. In the present example in which generator pack **256** is responsive to a robust instruction set, controller **216** performs step **535** by sending the second change level along with the delay value and first change level that the controller sends at step **525**. Generator pack **256** then implements the change of the modeling light of multifunction lighting system **208** to the second change level after the internal timer of the generator pack times-out on the set delay value. If in another implementation controller **216** provides the timer functionality, the controller could send a second IOC signal containing the second change level in response to the timer timing out. Still further options are possible, depending on the particular capabilities of the modeling lighting devices at issue. It is noted that the flow diagram for method **500** does not capture other steps that can be implemented to provide various other operating features that may be needed to provide desired operation. For example, once controller **216** detects a camera body AFA signal at step **520**, it may be desirable to disable Wake mode **420** and/or backlight (B/L) mode **428** to prevent the controller from changing the modeling lighting to an illumination output level unsuitable for assisting autofocusing.

After controller **216** performs step **535**, example method **500** proceeds to step **515** at which the controller determines (or knows) whether or not Wake mode **420** is enabled. If Wake mode **420** is not enabled, method **500** proceeds to step **540** at which controller **216** determines (or knows) Backlight (B/L) mode **428** is enabled. However, if Wake mode **420** is enabled (step **515**), at step **545** controller **216** determines whether or not it detects a camera body wake signal. In this example (as seen further below in connection with FIG. **7**), the camera body wake signal is an analog signal indicated by an intermediate-level rise in a line voltage on the first pin of hotshoe **220** (FIG. **2**). (In this example, a high level rise in that line voltage indicates the presence of an AFA signal (see FIG. **7** and accompanying description.) When this line voltage is at the intermediate-level voltage, the camera body wake signal is said to be present. Correspondingly, a drop in the line voltage from the intermediate-level voltage corresponds to a sleep signal.

If controller **216** detects a camera body wake signal at step **545**, method **500** proceeds to step **550**, which in this example is implemented because the method is set up to continually loop through the various branches of the method. At step **550**, controller **216** determines whether or not it has already sent a first IOC signal based upon an earlier recognition that the camera body wake signal was high (in this example, at the intermediate-level voltage). If controller **216** has not already sent such first IOC signal, method **500** proceeds to step **555**, wherein the controller generates and transmits that first IOC signal. As will be seen below relative to FIG. **7**, in this example, step **555** essentially causes the modeling lighting of multifunction lighting system **208** to change almost instantaneously after the leading edge of the line voltage begins to rise toward the intermediate level. In this example, the sending of the first IOC signal at step **555** includes sending to wireless communications device **260** (FIG. **2**) of generator pack **256** the first change level noted in field **440**A of GUI **412**. After controller **216** sends the first IOC signal at step **555**, method **500** proceeds to step **540** so as to continue the looping. If at step **550** controller **216** determines that the first IOC signal from step **555** was sent previously since the current camera body wake signal became present, method **500** proceeds to step **540** and continues the continual looping.

If at step **545** controller **216** did not detect a wake signal, then method **500** proceeds to step **560** at which the controller detects whether a camera body sleep signal has occurred. If a camera sleep signal has not occurred, method **500** proceeds to step **540** to continue the looping nature of the method. In this example, the user-set delay value present in field **440**C of GUI **412** (FIG. **4**) is implemented relative to the camera body sleep signal. Since wireless communications device **260** includes a built-in timer, when controller **216** detects a camera body sleep signal at step **560** it proceeds to step **565** in which it implements the set delay value from field **440**C. In this example, controller **216** accomplishes step **565** by transmitting to wireless controller a second IOC signal that includes the second change level setting set in field **440**B of GUI **412**, along with a set-timer instruction and the delay value set in field **440**C of GUI **412**. At step **570** controller **216** causes the modeling lighting of multifunction lighting system **208** to change to the second change level set in field **440**B of GUI **412**. Again, controller **216** performs step **570** by way of the transmitting of the set delay value to wireless communications device **260** at the same time as the second change level setting. Generator pack **256** then changes the illumination output level of the modeling lighting to the second change level when the timer in second wireless communications device times out on the delay. In other embodiments, steps **565** and **570** can be handled differently. For example, if controller **216** were to have the timer functionality, step **565** could involve the controller setting the timer, and step **570** could involve the controller transmitting the second change level upon timing out of the timer. Of course, other possibilities exist. It is noted, too, that the delay could be initiated, for example, from the initial wake signal detection rather than the sleep signal detection. After controller has performed steps **565**, **570**, method **500** loops back to step **540**.

In another variation in which wireless communications device **260** at generator pack **256** includes a built-in timer to handle the delay values set in fields **436**C, **440**C of GUI **412**, this communications device may be augmented with additional timer functionality to account for instances where either camera body **204** never generates, in this example, a sleep signal (such as when a user turns the camera body off while it is still awake) or controller **216** never transmits a second IOC signal (such as when a user turns off the controller before detecting a sleep signal and/or transmitting the second IOC) or a receiver failing to receive a second IOC signal, for example, because of interference between the transmitter and receiver. In such a case, wireless communications device **260** can include a second timer that is reset with a delay value (herein called an "inactivity delay value") each time it receives a first IOC signal. This inactivity delay value will typically be stored in wireless communications device **260** and should be a value greater than any reasonably anticipated value for either of the delay values set in fields **436**C, **440**C of GUI **412** (FIG. **4**). In one example, the inactivity delay value is set to 10 minutes, though many other values may be used.

In conjunction with the inactivity delay value, wireless communications device **260** may also be programmed with a inactivity illumination output value setting that the wireless communications device can load into generator pack **256** if the wireless communications device's timer times out on the inactivity delay value, for example, if it never receives a second IOC signal in the normal course of method **500**. Again, this can happen in this example if camera body **204** never generates a sleep signal and/or controller **216** never transmits a second IOC signal, among other events. The inactivity illumination output value setting may be the same as, or different from, either or both of the illumination output value settings in fields **436**B, **440**B of GUI **412**.

At step **540**, if controller **216** detects (or knows) that Backlight (B/L) mode **428** (FIG. **4**) is not enabled, method **500** simply loops back to step **510**. However, if Backlight mode **428** is enabled, at step **575** controller **216** determines whether or not a camera body B/L signal (e.g., either an on or off signal) has occurred. If not, method **500** simply loops back to step **510**. However, if controller **216** detects a camera body B/L signal at step **575**, it proceeds to step **580** to determine whether or not it has already sent a first IOC signal at step **585** to modeling lighting device **212** (FIG. **2**), in this case simply a toggling signal. If controller **216** determines it has not sent the first IOC signal, method **500** proceeds to step **585** and sends that signal. It is noted that if modeling lighting device **212** were so enabled to respond to transmitted first and second change levels, the transmission of the relevant signaling at step **585** could include such a level value. After controller **216** generates and transmits an IOC signal at step **585**, method **500** loops back to step **510**. If, however, at step **580** controller **216** determines that it has already sent a first IOC signal (e.g., in response to a user turning camera body backlighting on), method **500** proceeds to step **590** at which the controller generates and transmits a second IOC signal (here, simply another toggle signal), for example, in response to the user turning the camera backlighting off. After controller **216** generates and transmits an IOC signal at step **590**, method **500** loops back to step **510**. It is noted that as with additional optional steps of method **500** relating to AF Assist mode **424**, various additional optional steps may be added relative to Wake and Backlight modes **420**, **428**. For example, various disabling steps and/or interrupt steps may be added to disable certain functionality and/or to allow ones of the various modes to interrupt one another. Those skilled in the art will readily understand how to implement the illustrated and other steps using well known programming and/or circuit design techniques.

Referring now to FIGS. **6**-**8**, and also to FIGS. **2** and **4**, FIGS. **6**-**8** illustrate example timing diagrams **600**, **700**, **800** for scenarios involving ones of the Wake and AF Assist modes **420**, **424** (FIG. **4**). As mentioned above, these diagrams **600**, **700**, **800** are for a camera body, such as camera body **204** of FIG. **2**, that communicates wake and autofocus assist signals via common hotshoe contacts as analog voltage signals, as opposed to digital data packet signals. That said, as mentioned above those skilled in the art could readily implement the same sort of control scheme in a digital instruction signaling environment that uses digital packet signal analogs to the analog voltage signals. In timing diagrams **600**, **700**, the settings for Wake mode **420** are: first power change level=50%; second power change level=15%; delay=2 seconds, and the settings for AF Assist mode **424** are: first power change level=80%; second power change level=60%; delay=5 seconds. These settings are shown on screen **416** of FIG. **4**.

Referring to FIGS. **2**, **4** and **6**, timing diagram **600** of FIG. **6** is an example in which only AF Assist mode **424** is enabled. In this example, camera body **204** (FIG. **1**) has generated first and second AFA signals **604**, **608** approximately 2 seconds apart from one another. Camera body **204** may generate each AFA signal **604**, **608** in any number of ways, such as in an automatic mode in response to a user performing a half-press on shutter release button **224** of the camera body or in response to the user pressing a dedicated AFA button **228** of the camera body. When wireless controller **216** first detects the leading edge **604**A of first AFA signal **604**, in this example, it generates and transmits a modeling light instruction (set) containing the first power change level, the second power change level and the delay values set, for example, via GUI **412** of FIG. **4**. Once generator pack **256** receives this instruction (set), as represented by modeling light illumination output curve **612** it changes the output level of the modeling light to the first power change level (here, 80%) from whatever level the modeling light was set to prior to receiving the instruction (set) (here, 0%) and starts a delay timer (not shown) internal to the modeling light using the preset delay value (here, 5 seconds).

If controller **216** does not detect another AFA signal in about 5 seconds from detecting first AFA signal **604**, i.e., in about the time of the delay value, the built-in timer of wireless communications device **260** will time-out and this wireless device will initiate via generator pack **256** the second power level change of the modeling light to the preset level (here, 60%). However, in the case illustrated in FIG. **6**, within about 2 seconds of detecting first AFA signal **604**, controller **216** detects second AFA signal **608**, which in this example causes the controller to send the same instruction (set) it sent in response to the detection of the first AFA signal. When wireless communications device **260** receives this second instruction (set), it initiates the first power level change (which is not actually a change since the first power change level had already been set in response to first AFA signal **604**) of the modeling light and re-sets its internal timer to the preset delay value. Since in this example controller **216** does not detect another AFA signal within about 5 seconds (again, the preset delay) of second AFA signal **608**, after the built-in timer of wireless communications device **260** times out, as seen by modeling light illumination output curve **612**, this communications device initiates the second power change and changes the modeling light output level to the second power change level (here, 60%).

Referring now to FIGS. **2**, **4** and **7**, timing diagram **700** of FIG. **7** is an example for a scenario in which both Wake and AF Assist modes **420**, **424** are enabled. In this example, when the controller **216** detects a leading edge **704**A of a wake signal **704**, it generates and transmits a modeling light instruction (set) that contains the first power change level. When wireless communications device **260** receives that instruction (set), as illustrated by modeling light illumination output curve **708**, it changes via generator pack **256** the modeling light output level from whatever level it was previously set to (here 10%) to the first power change level (here, 50%). As seen from timing diagram **700**, while camera body **204** remains awake (and correspondingly, wake signal **704** remains high), the camera body generates first and second AFA signals **712**, **716**, in this example 1.5 seconds apart from one another. When controller **216** detects the leading edge **712**A of first AFA signal **712**, it generates and transmits a modeling light instruction (set) in a manner essentially the same as described above relative to FIG. **6**. This instruction (set) includes the first power change level, the second power change level and the delay for the AF Assist mode (here, respectively, 80%, 60%, 5 seconds). Upon receiving such instruction (set), as seen by modeling light illumination output curve **708**, generator pack **256** changes its modeling light power output to 80% and sets its internal timer to 5 seconds.

Like the example of FIG. **6**, if controller **216** does not detect another AFA signal in about 5 seconds from detecting first AFA signal, i.e., about the time of the AF Assist mode delay value, the built-in timer of wireless communications device **260** will time-out and will cause generator pack **256** to make the second power level change to the preset level (here, 60%). However, in the scenario illustrated in FIG. **7**, within about 1.5 seconds of detecting first AFA signal **712**, controller **216** detects second AFA signal **716**, which in this example causes the controller to send the same instruction (set) it sent in response to the detection of first AFA signal. When wireless communications device **260** receives this second instruction (set), as seen by modeling light illumination output curve **708**, it initiates via generator pack **256** the first modeling light power level change (which is not actually a change since the first power change level had already been set in response to first AFA signal **712**) and re-sets the communications device's timer to the preset delay value. Since in this example controller **216** does not detect another AFA signal within about 5 seconds (again, the preset delay) of second AFA signal **512**, after the built-in timer of wireless communications device **260** times out, as seen by modeling light illumination output curve **508**, the communications device initiates the second power change and changes the output level of the modeling light to the second power change level (here, 60%).

In this example, after the timer internal to wireless communications device **260** has timed out from second AFA signal **716**, camera body **204** is still awake for a few seconds, as indicated by wake signal **704** still being high. Camera body **204** may remain awake, for example, because a user continues to hold shutter release button **224** at half-press. However, once controller **216** detects the trailing edge **704**B of wakeup signal **704** (i.e., a sleep signal), it generates and transmits to wireless communications device **260** a modeling light instruction (set) containing the wakeup mode second power change level (here, 15%) and the wake mode delay (here, 2 seconds). When wireless communications device **260** receives this instruction (set), it sets its internal delay timer to 2 seconds. When the internal timer times out, as seen by modeling light illumination output curve **708**, wireless communications device **260** causes generator pack **256** to change its modeling light output level from the current level (here, the 60% level from the second power change of AF Assist mode **424**) to the second power change level (here, 15%). As described above, if controller **216** is so enabled, after this last transmission it may enter a sleep mode to save power.

FIG. **8** illustrates example circuitry **804** that may be used in, for example, camera body interface **308** (FIG. **3**) of controller **216** (FIGS. **2** and **3**) to convert "raw" camera body wake and AFA signals **808**, **812** available, in this example, at hotshoe **220** of camera body **204** to signals suitable for use in microprocessor **300** of the controller. In the context of example circuitry **804**, camera body wake and AFA signals **808**, **812** are of the same analog character as the like signals **604**, **608**, **704**, **712**, **716** of FIGS. **6** and **7**, above. More precisely, in this example, wake signal **808** is characterized by a rise in voltage from a low voltage (here, 0V) to a midlevel voltage (here, 1V), and autofocus signal **812** is characterized by a rise in voltage from the midlevel voltage to a high voltage (here, 3.5V).

Circuitry **804** includes an input **816** that carries an input voltage signal **820** that contains wake and AFA signals **808**, **812** when they occur. Input **816** is electrically coupled to inputs of corresponding respective first and second comparators **824**, **828** that each compare input voltage signal **820** to a particular reference voltage on a corresponding reference voltage line **832**, **836**. Here, the reference voltage for first comparator **824** is 0.5V, which allows the first comparator to output a wake-signal-present signal **840** when wake signal **808** is present on input **816**. Similarly, the reference voltage for second comparator **828** is 2V, which allows the second comparator to output an AFA-signal-present signal **844** when AFA signal **812** is present on input **816**. In this example, wake-signal-present and AFA-signal-present signals **840**, **844** are provided as inputs to microprocessor **300** (FIG. **3**). If the I/O voltage regime of microprocessor **300** is 0V to 3.3V, then the wakeup-signal-present and AFA-signal-present signals **840**, **844** output from comparators **824**, **828** are either about 0V or about 3.3V, depending on whether corresponding wake and AFA signals **808**, **812** are present on input voltage signal **820**. Of course, those skilled in the art will readily appreciate that other circuitry may be used.

While the foregoing example is directed to an analog signaling scheme, those skilled in the art would readily be able to implement control concepts of the present disclosure in a digital signaling scheme where a camera body communicates various state and control information internally and/or externally using digitally encoded information. In addition, it is noted that while the foregoing example is directed to a controller located externally relative to a camera body, as mentioned above a controller of the same, like or other control functionality can be built into a camera body. A potential advantage of building a controller implementing broad concepts of the present disclosure into a camera body is that a greater variety of camera body signals would likely be available, since typically only a subset of the signals generated by a camera body are normally available externally to a camera body through various ports on the camera body.

While FIGS. **2-8** are directed specifically to controlling modeling lighting devices, methods incorporating broad concepts disclosed herein, such as method **100** of FIG. **1**, can be used to control virtually any type of controllable device. FIG. **9** generally illustrates this concept. FIG. **9** illustrates diagrammatically a flexible system **900** that allows a photographer to control any one or more of a myriad of devices of any one or more types using one or more camera body controls **904** located on a camera body **908**. In this example, devices that are controllable include modeling lighting devices **912** (**912**(**1**)-(N)) (which may be similar to modeling lighting apparatuses **208**, **212** of FIG. **2**), special effects devices **916** (**916**(**1**)-(N)) (such as a fan, a snow shaker, a misting device, a fogger, a rain maker, a sprayer, etc.), non-modeling continuous lighting devices **920** (**920**(**1**)-(N)) (such as ambient lighting (e.g., general studio/room lighting), in-scene lighting (e.g., electric lamps), etc.) and in-scene non-lighting devices **924** (**924**(**1**)-(N)) (such as a motorized train set, magnetic actuator, etc.). As those skilled in the art will appreciate, the general steps illustrated in method **100** of FIG. **1** can be used to control any one or more of controlled devices **912**, **916**, **920**, **924** singly or in various combinations with one another, as described in more detail below.

To enable the remote control functionality, system **900** includes a remote device controller **928** that issues one or more appropriate power state control signals to one or more of controlled devices **912**, **916**, **920**, **924**. To accomplish this, remote device controller **928** includes a controlling means **932** and a transmitting means **936**. Controlling means **932** detects the one or more camera body signals designated for controlling the one or more controlled devices **912**, **916**, **920**, **924** and, in response thereto, generates the appropriate signal(s) and any corresponding information, such as device identifier(s) for identifying the particular device(s) for receiving the signal(s). Controlling means **932** can be implemented in any of a variety of ways in a manner similar to controller **216** discussed above relative to FIGS. **2-8**. These ways include: a microprocessor and software (firmware) combination; a microprocessor, software and hard circuitry combination; and hard circuitry alone. Those skilled in the art will readily understand how to implement any of these ways when confronted with particular camera body signaling and other design parameters. The signals generated by controlling means will have any of a variety of configurations, depending on the robustness of the signaling the relevant ones of controlled devices **912**, **916**, **920**, **924** are designed to handle. Such signaling ranges, for example, from a simple toggling signal to signals that include power state settings for the first and second power state change, delay settings and device identification codes.

Transmitting means **936** transmits the signal(s) generated by controlling means **932** via wireless communications "links" **940** to corresponding respective ones of controlled devices **912**(**1**)-(N), **916**(**1**)-(N), **920**(**1**)-(N), **924**(**1**)-(N) via corresponding respective receiving means **944**(**1**)-(N), **948**(**1**)-(N), **952**(**1**)-(N), **956**(**1**)-(N). Transmitting and receiving means **936**, **944**(**1**)-(N), **948**(**1**)-(N), **952**(**1**)-(N), **956**(**1**)-(N) can utilize any suitable communications mode, such as wireless RF communications (in which case wireless communications links **940** will be wireless RF links), wireless optical (infrared (IR), visible) communications (in which case wireless communications links **940** will be wireless optical links), etc. In the case of wireless RF communications, transmitting means **936** may be an RF transmitter or RF transceiver and each receiving means **944**(**1**)-(N), **948**(**1**)-(N), **952**(**1**)-(N), **956**(**1**)-(N) may be an RF receiver or RF transceiver. In the case of wireless optical communications, transmitting means **936** may be, for example, an IR transmitter (transceiver) or a visible light transmitter (e.g., flash lighting strobe) (transceiver), and each corresponding receiving means **944**(**1**)-(N), **948**(**1**)-(N), **952**(**1**)-(N), **956**(**1**)-(N) may be an IR receiver (transceiver) or visible light receiver (transceiver). Those skilled in the art will readily understand how to implement the desired communications mode as needed to suit a particular design.

Each controlled device **912**(**1**)-(N), **916**(**1**)-(N), **920**(**1**)-(N), **924**(**1**)-(N) shown in FIG. **9** is shown as having a corresponding alternative device extent **960**(**1**)-(N), **964**(**1**)-(N), **968**(**1**)-(N), **972**(**1**)-(N) to indicate that the corresponding receiving means **944**(**1**)-(N), **948**(**1**)-(N), **952**(**1**)-(N), **956**(**1**)-(N) can be located essentially internally relative to that controlled device rather than externally ("essentially" being used to indicate that one or more parts of the receiving means, such as antenna, optical sensor, etc., may be located externally). For example, any one of receiving means **944**(**1**)-(N), **948**(**1**)-(N), **952**(**1**)-(N), **956**(**1**)-(N) may be built into the corresponding controlled device **912**(**1**)-(N), **916**(**1**)-(N), **920**(**1**)-(N), **924**(**1**)-(N) or may be provided as an aftermarket solution.

Similarly, camera body **908** is shown as having differing alternative extents **976**, **980** to show that remote device controller **928** and various parts thereof can be located either internally or externally relative to the camera body, depending on the particular design at issue. For example, when camera body **908** excludes the entirety of remote device controller **928**, the controller may be a hotshoe mountable device, such as shown with controller **216** of FIGS. **2** and **3**. However, in alternative embodiments, one or both of controlling means **932** and transmitting means **936** may be included within camera body **908**. In an example of the former, controlling means **932** may be implemented in the onboard microprocessor (not shown) of camera body **908** and transmitting means **936** implemented in an external accessory RF transmitter. In an example of the latter, controlling means **932** may be implemented in the onboard microprocessor (not shown) of camera body **908** and transmitting means **936** implemented in an onboard transmitter provided in the camera body, for example, at the time of manufacture.

Regardless of how remote device controller **928** is configured relative to camera body **908**, it may readily be configured to perform methods of the present disclosure, such as method **100** of FIG. **1**. For example, remote device controller **928** may be configured to have the same or similar functionality as described above relative to controller **216** in connection with FIGS. **2-8**, including the programmability illustrated relative to FIG. **4** and the signaling and functioning illustrated relative to FIGS. **5-8**. In this connection, it is noted that the functionality of controller **216** described above relative to FIGS. **2-8** is specific to modeling lighting. However, those skilled in the art will understand that the illumination output levels and control of modeling lighting devices **208**, **212** are readily translatable into power state levels and control of non-modeling lighting devices, such as special effects devices **916**, non-modeling continuous lighting devices **920** and in-scene non-lighting devices **924**.

For example, FIG. **10** illustrates a scenario within a photography studio **1000** in which a remote device controller (not shown, but the same as or similar to remote device controller **928** of FIG. **9**) is used to control non-modeling lighting devices, specifically, general studio lighting devices **1004**, a special effects fan **1008** and an in-scene lighting device, i.e., a post lamp **1012**. In this example, the remote device controller is configured in a manner similar to controller **216** of FIGS. **1** and **2**, has settings similar to the settings shown in GUI **412** of FIG. **4**, and performs the steps of method **500** of FIGS. **5**A-B at least with respect to Wake mode **420** and Backlight mode **428** (FIG. **4**). In particular and as described below in more detail, Wake mode **420** is used to control both fan **1008** and post lamp **1012**, and Backlight mode **428** is used to control studio lighting devices **100**.

Studio **1000** contains a scene **1016** to be photographed using a camera body **1020**. In this example, scene **1016** includes post lamp **1012**, a table **1024**, a bowl **1028** and a lit candle **1032** resting on the table. Scene **1016** is to be a very dimly lit scene, with the only light to be present when images are being captured by camera body **1020** during the image-acquisition phase being low levels of light from post light **1012** and from lit candle **1032**. Light levels during image acquisition are to be so low that any ambient lighting other than light from post light **1012** and lit candle **1032** must be extinguished. Also during image capture, fan **1008** is used to create a gentle breeze so as to cause lit candle **1032** to flicker slightly.

In this example, the remote device controller is built into camera body **1020** and includes an RF transmitter (not shown, but evidenced by antenna **1036** on the camera body). As mentioned, both fan **1008** and post light **1012** are being controlled using Wake mode **420** (FIG. **4**). Here, a single power controller **1040**, which includes a built-in RF receiver (not shown, but evidenced by antenna **1044**), is used to control both fan **1008** and post light **1012** by varying the electrical power provided to those devices. Power controller **1040**, in this example, includes a built-in timer (not shown) and is configured to be responsive to wireless signals containing power state change settings and a delay value in a manner similar to the modeling light of multifunctional lighting system **208** of FIG. **8**. Consequently, when the remote device controller detects a wake signal, it generates and transmits a signal that contains 1) the power state for power controller **1040** to change fan **1008** and post light **1012** to upon receipt of the signal, 2) the power state for the power controller to change the fan and post light to when the delay times-out, and 3) the delay value. These correspond to the values set in fields **436**A-C of GUI **412** of FIG. **4**. Note that in the present case, the values for fields **436**A-C are, respectively, 10%, 0% and 20 seconds. That is, the power states of fan **1008** and post light **1012** are very low upon the first power state change and are off after the expiration of the second delay. The 20 second delay gives the photographer about a 20 second window for capturing images.

As mentioned above, studio lighting devices **1004** are controlled using Backlight mode **428** (FIG. **4**), and during image capturing it is desired that the studio lighting be turned off. To facilitate this, studio **1000** includes a special switch **1048** that can be toggled on and off under wireless control. Consequently, switch **1048** includes a wireless receiver (not shown, but evidenced by antenna **1052**). Referring to FIG. **4**, sub-mode **444**B of Backlight mode **428** is selected in this example so that when the camera body backlighting is turned on, switch **1048**, and hence studio lighting devices **1004**, are turned off. Then, when a photographer is ready to acquire one or more images of scene **1016** under low-level lighting conditions, the photographer simply needs to turn the camera backlighting on, for example, using a backlighting control switch **1056** on camera body **1020**. The photographer may do this at any desired time, for example, after he/she turns on fan **1008** and post light **1012**, which can be accomplished by actuating a partial-press of a shutter-release button **1060** on camera body **1020**. As described above, a partial-press typically causes a camera body, such as camera body **1020** to generate a camera body wake signal, which the remote device controller aboard the camera body then uses to perform the process of controlling fan **1008** and post light **1012** via power controller **1040**. Those skilled in the art will readily understand that this example is merely illustrative and in no way should be construed as limiting. There are many ways of controlling studio lighting devices **1004**, fan **1008**, post light **1012** and other devices using the broad concepts disclosed herein.

Studio **1000** of FIG. **10** also includes an LED-array modeling lighting device **1064**, which, in this example is powered by a battery pack **1068**. Modeling lighting device **1064** can be controlled using any suitable one of the control schemes disclosed herein for controlling remote devices, such as the control schemes described above or devised in the spirit of the specifically disclosed control schemes and the present disclosure. An advantage of implementing such a control scheme in connection with LED-array modeling lighting device **1064**, other than the sheer ease, is that the device can be controlled to be turned on and/or adjusted to the appropriate power level substantially only when its light is needed, thereby reducing the power drain on battery pack. When such control schemes are utilized with other modeling lighting devices, and other light devices generally, these control schemes can greatly reduce usage of those devices, thereby extending the time between replacements of burned-out light bulbs. This can result in significant cost savings in replacement bulbs over time.

As mentioned above, remote-device control functionality disclosed herein can be implemented regardless of whether the camera body signal(s) utilized is/are analog signals or digital signals. The examples of FIGS. **6**-**8**, above, are directed to utilizing analog AF assist and backlighting control signals of a corresponding camera body that generates such signals to achieve the described exemplary remote-device control functionality. For the sake of completeness, FIG. **11** illustrates a digital camera-body-status communication signal **1100** that generally includes digital equivalents to the AF assist and backlighting signals discussed above. In this example, when the camera body is awake the camera body continually broadcasts camera-body/flash status and settings information via communication signal **1100** in the form of digital data bursts, here **1104**, **1108**, **1112**, **1116**, **1120** that each contain, for example, 12 to 24 bytes of status information, bits of which indicates statuses of various camera-body/flash status and settings. In this example, FIG. **11** shows four bytes **1120**A-D of such 12 to 24 bytes of burst **1120**, and one of these bytes, i.e., byte **1120**B, contains a status bit **1124** of interest. In this example, status bit **1124** is a bit that indicates whether or not the backlight is on, with a high value (1) indicating on and a low value (0) indicating off. Byte **1120**B or other byte of any one of the data bursts can also include a status bit indicating that an AF-assist request has been made. The same is true for many other camera-body signals, such as a red-eye-reduction signal, among others. When the camera-body signals being utilized for remote-device control functionality, the corresponding controller, for example, the digital counterpart to controller **216** of FIG. **2**, can be configured to monitor communications signal **1100** for the bit(s) of interests, for example, using digital signal monitoring techniques known in the art. Once the controller detects the desired signal(s) it can implement the desired remote-device control functionality, for example, any one or more of the functionalities described herein.

Exemplary embodiments have been disclosed above and illustrated in the accompanying drawings. It will be understood by those skilled in the art that various changes, omissions and additions may be made to that which is specifically disclosed herein without departing from the spirit and scope of the present invention.

What is claimed is:

1. A method of controlling a power state of a non-camera remote device using a camera body, the method comprising:

detecting a first camera body backlighting control signal that is generated in response to a user actuation of a backlighting control switch;

generating a first power state control signal in response to said detecting of the first camera body backlighting control signal, wherein the first power state control signal is configured to change the power state of the remote device; and

wirelessly transmitting the first power state control signal to the remote device in response to said detecting of the first camera body backlighting control signal so as to cause the non-camera remote device to operate at a first power state, wherein the first power state is a power state of an output functionality of the non-camera remote device.

2. A method according to claim **1**, further comprising causing the remote device to change from the first power state to a second power state different from the first power state.

3. A method according to claim **2**, wherein said causing of the remote device to change from the first power state to the second power state includes:

detecting a second camera body backlighting control signal;

generating a second power state control signal in response to said detecting of the second camera body backlighting control signal, wherein the second power state control signal is configured to change the power state of the remote device; and

wirelessly transmitting the second power state control signal to the remote device so as to cause the remote device to operate at the second power state.

4. A method according to claim **2**, wherein said causing of the remote device to change from the first power state to the second power state includes:

implementing a time delay as a function of said detecting of the first camera body backlighting control signal;

generating a second power state control signal in response to expiration of the time delay, wherein the second power state control signal is configured to change the power state of the remote device; and

wirelessly transmitting the second power state control signal to the remote device so as to cause the remote device to operate at a second power state.

5. A method according to claim **1**, wherein said detecting of the first camera body backlighting control signal includes detecting the first camera body backlighting control signal internally relative to the camera body and said generating of the first power state control signal includes generating the first power state control signal internally relative to the camera body.

6. A method according to claim **1**, wherein said detecting of the first camera body backlighting control signal includes detecting the first camera body backlighting control signal externally relative to the camera body, said generating of the first power state control signal includes generating the first power state control signal externally relative to the camera body and said wireless transmitting of the first power state control signal includes wirelessly transmitting the first power state control signal externally relative to the camera body.

7. A method according to claim **6**, wherein the camera body has a hotshoe and said detecting of the first camera body backlighting control signal externally relative to the camera body includes detecting the first camera body control signal via the hotshoe.

8. A method according to claim **1**, wherein said detecting of the first camera body backlighting control signal includes detecting a camera backlighting-on signal and said generating of the first power state control signal includes generating a first power state off signal configured to turn off the remote device.

9. A method according to claim **1**, wherein the remote device is a continuous lighting device and said generating of the first power state control signal includes generating an illumination output level signal.

10. A method according to claim **9**, wherein the continuous lighting device includes a modeling lighting device responsive to the illumination output level signal.

11. A method according to claim **9**, wherein the continuous lighting device includes an ambient lighting device responsive to the illumination output level signal.

12. A method according to claim **9**, wherein the continuous lighting device includes an in-scene lighting device responsive to the illumination output level signal.

13. A method according to claim **1**, wherein the remote device is a non-lighting device.

14. A method according to claim **13**, wherein the non-lighting device is a special effects device.

15. A method according to claim **13**, wherein the non-lighting device includes a motor and said generating of the first power state control signal includes generating a motor speed control signal.

16. A method according to claim **1**, wherein said wireless transmitting of the first power change signal includes wirelessly transmitting the first power change signal to a wireless communications device in wired communication with the remote device.

17. A machine-readable hardware storage medium containing machine-executable instructions for controlling a power state of a non-camera remote device using a camera body, the machine-executable instructions comprising:

a first set of machine-executable instructions for implementing detection of a first camera body backlighting control signal that is generated in response to a user actuation of a backlighting control switch;

a second set of machine-executable instructions for generating a first power state control signal in response to the detection of the first camera body backlighting control signal, wherein the first power state control signal is configured to change the power state of the remote device; and

a third set of machine executable instructions for controlling wireless transmission of the first power state control signal to the remote device in response to said detecting of the first camera body backlighting control signal so as to cause the non-camera remote device to operate at a first power state, wherein the first power state is a power state of an output functionality of the non-camera remote device.

18. A machine-readable hardware storage medium according to claim **17**, further comprising a fourth set of machine-executable instructions for causing the remote device to change from the first power state to a second power state different from the first power state.

19. A machine-readable hardware storage medium according to claim **18**, wherein said fourth set of machine-executable instructions includes:

machine-executable instructions for implementing detection of a second camera body backlighting control signal;

machine-executable instructions for generating a second power state control signal in response to said detecting of the second camera body backlighting control signal, wherein the second power state control signal is configured to change the power state of the remote device; and

machine-executable instructions for controlling wireless transmission of the second power state control signal to the remote device so as to cause the remote device to operate at the second power state.

20. A machine-readable hardware storage medium according to claim **18**, wherein said fourth set of computer-executable instructions includes:

machine executable instructions for implementing a time delay as a function of said detecting of the first camera body backlighting control signal;

machine-executable instructions for generating a second power state control signal in response to expiration of the time delay, wherein the second power state control signal is configured to change the power state of the remote device; and

machine-executable instructions for controlling wireless transmission of the second power state control signal to the remote device so as to cause the remote device to operate at a second power state.

21. A machine-readable hardware storage medium according to claim **17**, wherein said first set of machine-executable instructions includes machine-executable instructions for implementing detection of the first camera body backlighting control signal internally relative to the camera body and said second set of machine-executable instructions includes machine-executable instructions that generate the first power state control signal internally relative to the camera body.

22. A machine-readable hardware storage medium according to claim **17**, wherein said first set of machine-executable instructions includes machine-executable instructions for implementing detection of the first camera body backlighting control signal externally relative to the camera body, said second set of machine-executable instructions includes machine executable for generating the first power state control signal externally relative to the camera body and said third set of machine-executable instructions includes machine-executable instructions for controlling external wireless transmission of the first power state control signal.

23. A machine-readable hardware storage medium according to claim **22**, wherein the camera body has a hotshoe and said machine-executable instructions for implementing detection of the first camera body control signal externally relative to the camera body include machine-executable instructions for implementing detection of the first camera body control signal via the hotshoe.

24. A machine-readable hardware storage medium according to claim **17**, wherein said first set of machine-executable instructions includes machine-executable instructions for implementing detection of a camera backlighting-on signal and said second set of machine-executable instructions includes machine-executable instructions that generate a first power state off signal configured to turn off the remote device.

25. A machine-readable hardware storage medium according to claim **17**, wherein the remote device is a continuous lighting device and said second set of machine-executable instructions includes machine-executable instructions that generate an illumination output level signal.

26. A machine-readable hardware storage medium according to claim **17**, wherein the remote device includes a motor and said second set of machine-executable instructions includes machine-executable instructions that generate a motor speed control signal.

* * * * *