UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
SHERMAN DIVISION

IMPERIUM IP HOLDINGS (CAYMAN), LTD.	§	
	§	
v.	§	
	§	CIVIL ACTION NO. 4:14-CV-371
SAMSUNG ELECTRONICS CO., LTD., ET. AL.	§	Judge Mazzant
	§	

MEMORANDUM OPINION AND ORDER

This Memorandum Opinion and Order construes the disputed terms in United States Patents No. 6,271,884 ("'884 Patent"), 6,836,290 ("'290 Patent"), and 7,092,029 ("'029 Patent"). Claim construction arguments were submitted in Plaintiff Imperium IP Holdings (Cayman), Ltd.'s ("Plaintiff's") Opening Claim Construction Brief (Dkt. #87), Defendants Samsung Electronics Co., Ltd.'s, Samsung Electronics America, Inc.'s, and Samsung Semiconductor, Inc.'s ("Defendants'") Responsive Claim Construction Brief (Dkt. #91), Plaintiff's Claim Construction Reply Brief (Dkt. #96), and Defendants' Sur-Reply Claim Construction Brief (Dkt. #98). Also before the Court are the Parties' April 13, 2015 Joint Claim Construction and Prehearing Statement (Dkt. #86) ("Prehearing Statement") and the Parties' May 27, 2015 Joint Claim Construction Chart (Dkt. #99).

The Court conducted a claim construction hearing on June 10, 2015, and the Court hereby incorporates-by-reference the claim construction hearing transcript as well as the demonstrative slides presented by the Parties during the hearing (Dkt. #103; Dkt. #104). For the following reasons, the Court provides the constructions set forth below.

Table of Contents

BACKGROUND

Plaintiff brings suit alleging infringement of United States Patents No. 6,271,884, 6,836,290, and 7,092,029 (collectively, the "patents-in-suit"). In general, the patents-in-suit relate to digital cameras and the sensor arrays used therein. A sensor array typically includes an array of pixels, and each pixel typically includes a photodiode. Light that strikes a photodiode generates a charge that is then "read out." An analog-to-digital converter ("A/D converter" or "ADC") receives the "read outs" of the light intensity at each pixel in the form of an analog signal. The A/D converter uses the analog signal to generate digital information from which a microprocessor can construct a digital image.

The three patents-in-suit are addressed separately, below. Of note, the Court has previously construed terms in the '884 Patent in *Imperium (IP) Holdings, Inc. v. Apple Inc., et al.*, No. 4:11-CV-163 ("*Imperium I*"), Dkt. #209 (E.D. Tex. July 2, 2012). In that case, the Court also denied a motion for summary judgment of indefiniteness as to the '884 Patent. *See id.*, Dkt. #210 at 2-6. After further proceedings, the Court modified its construction of "adjusting the overall system gain by adjusting the integration time," discussed below. *See id.*, Dkt. #401 at 3-5.

LEGAL STANDARDS

Claim construction is a matter of law. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995). The purpose of claim construction is to resolve the meanings and technical scope of claim terms. *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997). When the parties dispute the scope of a claim term, "it is the court's duty to resolve it." *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008).

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303,

1312 (Fed. Cir. 2005) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). The Court examines a patent's intrinsic evidence to define the patented invention's scope. *Id.* at 1313-14; *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). Intrinsic evidence includes the claims, the rest of the specification, and the prosecution history. *See, Phillips*, 415 F.3d at 1312-13; *Bell Atl. Network Servs.*, 262 F.3d at 1267. The Court gives claim terms their ordinary and customary meaning as understood by one of ordinary skill in the art at the time of the invention. *Phillips*, 415 F.3d at 1312-13; *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

Claim language guides the Court's construction of claim terms. *Phillips*, 415 F.3d at 1314. "[T]he context in which a term is used in the asserted claim can be highly instructive." *Id.* Other claims, asserted and unasserted, can provide additional instruction because "terms are normally used consistently throughout the patent." *Id.* Differences among claims, such as additional limitations in dependent claims, can provide further guidance. *Id.*

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id.* at 1315 (quoting *Markman*, 52 F.3d at 979). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Id.* (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *Teleflex. Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). In the specification, a patentee may define his own terms, give a claim term a different meaning than it would otherwise possess, or disclaim or disavow some claim scope. *Phillips*, 415 F.3d at 1316. Although the Court generally presumes terms possess their ordinary meaning, this presumption can be overcome by statements of clear disclaimer. *See SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1343-44 (Fed. Cir. 2001). This

presumption does not arise when the patentee acts as his own lexicographer. *See Irdeto Access, Inc. v. EchoStar Satellite Corp.*, 383 F.3d 1295, 1301 (Fed. Cir. 2004).

The specification may also resolve ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex*, 299 F.3d at 1325. For example, "[a] claim interpretation that excludes a preferred embodiment from the scope of the claim 'is rarely, if ever, correct.'" *Globetrotter Software, Inc. v. Elam Computer Group Inc.*, 362 F.3d 1367, 1381 (Fed. Cir. 2004) (quoting *Vitronics*, 90 F.3d at 1583). But, "[a]lthough the specification may aid the court in interpreting the meaning of disputed language in the claims, particular embodiments and examples appearing in the specification will not generally be read into the claims." *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988); *accord Phillips*, 415 F.3d at 1323.

The prosecution history is another tool to supply the proper context for claim construction because a patentee may define a term during prosecution of the patent. *Home Diagnostics Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent"). The well-established doctrine of prosecution disclaimer "preclud[es] patentees from recapturing through claim interpretation specific meanings disclaimed during prosecution." *Omega Eng'g Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003). "Indeed, by distinguishing the claimed invention over the prior art, an applicant is indicating what the claims do not cover." *Spectrum Int'l v. Sterilite Corp.*, 164 F.3d 1372, 1378-79 (Fed. Cir. 1988) (quotation omitted). "As a basic principle of claim interpretation, prosecution disclaimer promotes the public notice function of the intrinsic evidence and protects the public's reliance on definitive statements made during

prosecution." *Omega Eng'g*, 334 F.3d at 1324. However, the prosecution history must show that the patentee clearly and unambiguously disclaimed or disavowed the proposed interpretation during prosecution to obtain claim allowance. *Middleton Inc. v. 3M Co.*, 311 F.3d 1384, 1388 (Fed. Cir. 2002). Statements will constitute disclaimer of scope only if they are "clear and unmistakable statements of disavowal." *See Cordis Corp. v. Medtronic Ave, Inc.*, 339 F.3d 1352, 1358 (Fed. Cir. 2003). An "ambiguous disavowal" will not suffice. *Schindler Elevator Corp. v. Otis Elevator Co.*, 593 F.3d 1275, 1285 (Fed. Cir. 2010) (citation omitted).

Although "less significant than the intrinsic record in determining the legally operative meaning of claim language," the Court may rely on extrinsic evidence to "shed useful light on the relevant art." *Phillips*, 415 F.3d at 1317 (quotation omitted). Technical dictionaries and treatises may help the Court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but such sources may also provide overly broad definitions or may not be indicative of how terms are used in the patent. *Id.* at 1318. Similarly, expert testimony may aid the Court in determining the particular meaning of a term in the pertinent field, but "conclusory, unsupported assertions by experts as to the definition of a claim term are not useful." *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.*

Patent claims must particularly point out and distinctly claim the subject matter regarded as the invention. 35 U.S.C. § 112(b). This "require[s] that a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014); *see Biosig Instruments, Inc. v Nautilus, Inc.*, 783 F.3d 1374, 1377 (Fed. Cir. 2015). Whether a claim meets this definiteness requirement is a matter of law. *Young v. Lumenis, Inc.*,

492 F.3d 1336, 1344 (Fed. Cir. 2007). A party challenging the definiteness of a claim must show it is invalid by clear and convincing evidence. *Id*. at 1345.

In general, prior claim construction proceedings involving the same patents-in-suit are "entitled to reasoned deference under the broad principals of *stare decisis* and the goals articulated by the Supreme Court in *Markman*, even though *stare decisis* may not be applicable *per se*." *Maurice Mitchell Innovations, LP v. Intel Corp.*, No. 2:04-CV-450, 2006 WL 1751779, at *4 (E.D. Tex. June 21, 2006) (Davis, J.); *see Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 839-40 (2015) ("prior cases will sometimes be binding because of issue preclusion and sometimes will serve as persuasive authority") (citation omitted).

The Court nonetheless conducts an independent evaluation during claim construction proceedings. *See, e.g., Texas Instruments, Inc. v. Linear Techs. Corp.*, 182 F. Supp. 2d 580, 589-90 (E.D. Tex. 2002); *Burns, Morris & Stewart Ltd. P'ship v. Masonite Int'l Corp.*, 401 F. Supp. 2d 692, 697 (E.D. Tex. 2005); *Negotiated Data Solutions, Inc. v. Apple, Inc.*, No. 2:11-CV-390, 2012 WL 6494240, at *5 (E.D. Tex. Dec. 13, 2012).

DISPUTED CLAIM TERMS IN THE '290 PATENT

The '290 Patent, titled "Combined Single-Ended and Differential Signaling Interface," issued on December 28, 2004, and bears an earliest priority date of April 17, 1998. Plaintiff submits:

> [A] camera uses interfaces to transmit data between the image sensor, which receives the light coming through the lens into the camera and turns that light into an image, and other circuitry of the camera. Before the '290 patent, two mutually exclusive interface solutions existed: "single-ended" interfaces and "differential" interfaces. * * *
>
> The inventors of the '290 patent eliminated the need to choose between the two interfaces: the interface of the '290 patent allows either single-ended or differential data transmission. In particular, the preferred embodiment describes a circuit that the user can set "to provide either a single-ended output or a differential output."

Opening (Dkt. #87) at 2-3 (footnotes omitted).

The Abstract of the '290 Patent states:

> A data interface for CMOS imagers is disclosed that can be either a single-ended interface or a differential interface. The single-ended interface provides compatibility with many existing external devices. Further providing a differential interface allows a lower noise and a lower power interface for external devices that can support a differential signal. The combined single-ended and differential signal interface does not increase the number of pins required for a single-ended only interface. The data transfer width is set to the word width, which allows a fixed timing relationship between the clock edge and data transfer in both single-ended and differential modes. In single-ended mode, the data is transferred once per clock, but in the differential mode, the data is transferred twice per clock, once on each clock edge. This fixed timing relationship eliminates the need for and cost of explicit bit synchronization.

The parties have agreed that, in the '290 Patent, "differential interface" means "an interface that uses two lines to communicate a signal." Prehearing Statement (Dkt. #86) at 2.

1. "single-ended interface"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"an interface that uses a single line to communicate a signal"[1]	"an interface that uses a single line to communicate a signal with a voltage referenced to ground"

Opening (Dkt. #87) at 7; Response (Dkt. #91) at 4. The parties submit that this term appears in Claims 1 and 10. *See* Prehearing Statement (Dkt. #86), Ex. B at 1.

Plaintiff argued that Defendants' proposed construction "reads limitations from the specification into the claims and attempts to limit the claims to the patent's disclosed embodiments." Opening (Dkt. #87) at 6.

[1] Plaintiff previously proposed "an interface that uses a single line to *transmit* a signal." Prehearing Statement (Dkt. #86), Ex. B at 1 (emphasis added). Plaintiff has explained that "[o]n reviewing the issue further, [Plaintiff] is amenable to the use of 'communicate' in this construction." Opening (Dkt. #87) at 6 n.28.

Defendants responded that although "[t]he parties agree that a single-ended interface is an interface that communicates a signal using a single line," Plaintiff fails to acknowledge that "the signal is referenced to ground." Response (Dkt. #91) at 4. Defendants submitted that "[Plaintiff] does not point to any evidence establishing that grounding is unnecessary for a single-ended interface," and "the intrinsic and extrinsic evidence are consistent and confirm that 'single-ended interface' is a technical term of art that requires a single line with a voltage referenced to ground." *Id.* at 5.

Plaintiff replied that as to the embodiments of Figures 2 and 5, cited by Defendants, "the patent explicitly states that these embodiments are not limiting." Reply (Dkt. #96) at 2. Plaintiff also argued that "the dictionaries on which [Defendants] rel[y] do not represent the only meaning of a single-ended interface." *Id.* at 3.

In sur-reply, Defendants submit: "While [Defendants] believe[] that its construction is technically more accurate, [Defendants] do[] not believe there are any issues in the litigation that will turn on whether the Court adopts [Defendants'] construction or [Plaintiff's]. Accordingly, to narrow the issues for the Court, [Defendants] will agree to [Plaintiff's] construction." Sur-Reply (Dkt. #98) at 1. At the June 10, 2015 hearing, the parties confirmed that this term is no longer in dispute.

Thus, as now agreed upon by the parties, the Court hereby construes **"single-ended interface"** to mean **"an interface that uses a single line to communicate a signal."**

2. "wherein an output of the data interface circuit is selectable between a single-ended interface output and a differential interface output"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary Alternatively: "a single-ended interface output or a differential interface output can be chosen"	"wherein either the single-ended interface or the differential interface can be selected to output data from the data interface circuit"

Opening (Dkt. #87) at 8; Response (Dkt. #91) at 5. The parties submit that this term appears in Claims 1 and 10. *See* Prehearing Statement (Dkt. #86), Ex. B at 2.

a. The Parties' Positions

Plaintiff submits that "single-ended interface" is being addressed separately (above), that the parties have agreed upon a construction for "differential interface" (as noted above), that "there is no dispute over the meaning of the common word 'selectable,'" and that the remaining words are readily understandable. Opening (Dkt. #87) at 7. Plaintiff concludes that no construction is necessary. *Id.* Alternatively, Plaintiff submits that whereas its proposed construction is consistent with the claim language and the specification, Defendants' proposal errs by "requir[ing] that an 'interface' be selected, instead of the 'output' of the interface." *Id.* at 8.

Defendants respond that construction is necessary to clarify that the "output" terms refer to data. Response (Dkt. #91) at 5-6. Defendants also argue that Plaintiff's proposal fails to give meaning to the phrase "an output of the data interface circuit." *Id.* at 7. Defendants also urge that "the specification makes clear that the only selection that occurs is the selection of which interface (single-ended or differential) is used to output the data from the data interface circuit." *Id.*

Plaintiff replies that Defendants' proposal "is based on a preferred embodiment of the patent appearing in Figure 5," which should not be limiting. Reply (Dkt. #96) at 3. Plaintiff also argues that its proposed construction "fully captures the limitation 'output of the data interface circuit' by providing that one of the two claimed outputs can be chosen." *Id.* at 4.

In sur-reply, Defendants argue that Plaintiff improperly reads the word "output" out of context. Sur-Reply (Dkt. #98) at 1. Defendants submit that "[Plaintiff] does not address [Defendants'] showing that the *only* way to get a single-ended interface output is to select the single-ended interface and the only way to get a differential output is to select the differential interface." *Id.* at 2.

b. Analysis

The specification discloses:

> [T]he basic principles of the present invention have been defined herein specifically to provide an interface circuit for providing a *selectable single-ended and differential signal output* from a CMOS image sensor to an external digital signal processor.
>
> *The present invention is a data interface that can be either a single-ended interface or a differential interface.* A preferred embodiment of the present invention will now be described with reference to FIG. 5. The circuit 100 of FIG. 5 is *selectable to provide either a single-ended output or a differential output*. If a single-ended output is desired, the ENSE signal is enabled, and if a differential output is desired, the ENDF signal is enabled. Since only one mode can be selected at a time, the ENSE and ENDF signals are complementary. Thus, a single register bit for selecting the type of output may be used.

'290 Patent at 3:65-4:13 (emphasis added).

Because the disputed term itself (as well as the specification, as quoted above) refers to selecting an output, the Court hereby expressly rejects Defendants' proposal of referring to selection of an interface. Finally, the parties appear to agree that the constituent term "output"

refers to data rather than to, for example, a connector pin or a wire, so no clarification is necessary in that regard.

No further construction is necessary. *See U.S. Surgical*, 103 F.3d at 1568 ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro*, 521 F.3d at 1362 ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) ("Unlike *O2 Micro*, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction.").

The Court therefore hereby construes **"wherein an output of the data interface circuit is selectable between a single-ended interface output and a differential interface output"** to have its **plain meaning**.

3. "the sensor having a data interface circuit"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary Alternatively: "the CMOS image sensor has a data interface circuit"	"the CMOS image sensor including a circuit that communicates image data"

Opening (Dkt. #87) at 9; Response (Dkt. #91) at 8. The parties submit that this term appears in Claim 10. *See* Prehearing Statement (Dkt. #86), Ex. B at 1.

a. The Parties' Positions

Plaintiff argues that no construction is necessary because "[t]he plain language of the claims states that 'sensor' refers to the CMOS image sensor recited by the claim," and "[t]here

also can be no reasonable dispute that the words 'having,' 'data,' 'interface,' and 'circuit' are readily understood words that require no special construction." Opening (Dkt. #87) at 8. Plaintiff urges that "[t]he intrinsic record . . . does not contain an express definition or a disclaimer that would limit the claims" so as to require a sensor that communicates "image data," as Defendants have proposed. *Id.* at 8-9.

Defendants respond that "[t]he express language of the claim (and common sense) establishes that the data being communicated from the 'CMOS image sensor' to the 'image processor' must be image data." Response (Dkt. #91) at 8. "Notably," Defendants submit, "the '290 patent does not disclose or suggest any other type of data being communicated to the image processor through the data interface circuit." *Id.* at 9.

Plaintiff replies that "[o]nce again . . . [Defendants] rel[y] on exemplary embodiments" in the absence of any "words of manifest exclusion or restriction." Reply (Dkt. #96) at 5. Plaintiff also argues that "[t]he claims state that 'signals'—not 'image data'—are communicated. Similarly, the specification provides that an image processor receives 'signals' output by a data interface circuit, without limiting those signals to any particular type of signal or data." *Id.* at 5-6. Plaintiff explains that "the patent does not prevent the image sensor and image processor from communicating information other than image data . . . ." *Id.* at 6.

In sur-reply, Defendants argue that it is well-established that a claim can be drafted to cover only a particular disclosed embodiment. Sur-Reply (Dkt. #98) at 2. Defendants submit that "[t]he applicants chose to draft Claim 10 narrowly to cover only an 'imaging apparatus' and a data interface that connects an imaging sensor to a[n] imaging processor." *Id.* at 3. Defendants conclude that "the[] signals that are output from the data interface circuit are image data." *Id.*

At the June 10, 2015 hearing, Defendants confirmed that their position is that the data interface circuit communicates *only* image data.

b. Analysis

Claim 10 of the '290 Patent recites (emphasis added):

> 10. A CMOS imaging apparatus comprising:
> a CMOS image sensor, *the sensor having a data interface circuit* comprising:
> a first single-ended interface connected to a first signal output line;
> a second single-ended interface connected to a second signal output line; and
> a differential interface having a normal signal output connected to the first output line and a complementary signal output connected to the second signal output line;
> wherein an output of the data interface circuit is selectable between a single-ended interface output and a differential interface output; and
> an image processor connected to the CMOS image sensor to *receive the signals output by the data interface circuit*.

The Description of Related Art states:

> One of the advantages of CMOS image sensors (CMOS imagers) over CCD imagers is that the CMOS imager chip can include digital signal processing circuitry. In practice, the signal processing is more often performed on a companion chip, in order to provide greater application flexibility. However, CMOS imagers often have integrated analog to digital converters to convert the analog signal to a digital bit stream that can be processed by the companion chip. *The digitized information then must be transferred to companion chip or other external devices for picture storage, processing, or transmission.* A single-ended interface is the most common and simplest implementation for data transfer. An example of a single-ended interface is shown in FIG. 1. A driver circuit 2 in the CMOS imager 1 outputs a signal to the companion processing chip 3. A receiver 4 receives and amplifies the signal for further processing. FIG. 2 is a schematic of one possible CMOS implementation of the above-described single-ended interface.
>
> * * *
>
> FIG. 4 illustrates CMOS video imaging sensing circuitry according to the preferred embodiment disclosed in co-pending U.S. application Ser. No[.] 09/062,343. This circuitry includes a CMOS image sensor chip 50 and an image processor chip 52. The CMOS image sensor chip 50 typically includes a number

> of light responsive CMOS pixel sensors which develop analog signals representative of an image. These analog signals are then A to D converted by the ADC circuit to form digital signals Din_0, Din_1 . . . Din_n. The image processor chip 52 includes a data processor 53 which performs various manipulations of the image data such as compression and color processing. The processor 53 may be software driven or a hardware embodiment.
>
> As may be seen, the circuit of FIG. 4 employs a plurality of LVDS [(low voltage differential signaling)] circuits 11. Each circuit 11 includes a respective driver 54 and a respective receiver 56. Each driver 54 receives a respective input signal Din_0, Din_1 . . . Din_n, which are digital logic levels of, for example, 3.3 volts for logic "1" and zero volts for logic "0". Changes in state in these signals are transmitted over the differential lines to the respective receivers 56. Each receiver 56 generates a respective output signal $Dout_0$, $Dout_1$, . . . $Dout_n$, which are at the several hundred milli-volt level.

'290 Patent at 1:16-35 & 2:14-37 (emphasis added); *see id.* at Fig. 4; *see also id.* at 3:22-37 ("The present invention is a *data interface for CMOS imagers* that can be either a single-ended interface or a differential interface.") (emphasis added); *id.* at 3:60-4:21.

Also, a parent patent application refers to image data communicated from a CMOS sensor to an image processor. *See* Response (Dkt. #91), Ex. D, United States Patent Application No. 09/062,343 at 2 ("It is still another object of the invention to provide for faster, more efficient *pixel data transmission* in CMOS imaging apparatus.") (emphasis added); *see also id.* at 3 & 7.

Defendants have cited authority holding that "[t]he claims of the patent must be read in light of the specification's consistent emphasis on [a] fundamental feature of the invention." *Praxair, Inc. v. ATMI, Inc.*, 543 F.3d 1306, 1324 (Fed. Cir. 2008).

On balance, however, none of the evidence cited by Defendants demonstrates that the data interface circuit is limited to communicating only image data. Also of note, above-quoted Claim 10 recites (emphasis added): "an image processor connected to the CMOS image sensor to

receive the *signals* output by the data interface circuit." The Court therefore hereby expressly rejects Defendants' argument that the data interface circuit must communicate *only* image data.

Nonetheless, the above-discussed evidence cited by Defendants adequately demonstrates that the "data interface circuit" must *at least* communicate image data signals. At the June 10, 2015 hearing, Plaintiff acknowledged that image data must be at least part of what the data interface circuit communicates.

The Court accordingly hereby construes **"the sensor having a data interface circuit"** to mean **"the CMOS image sensor has a circuit that communicates image data signals,"** with the above-discussed understanding that the data interface circuit need not be restricted to communicating *only* image data.

4. "an image processor connected to the CMOS image sensor to receive the signals output by the data interface circuit"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary	"a processor connected to the CMOS image sensor for processing image data received from the single-ended and the differential interfaces"

Opening (Dkt. #87) at 10; Response (Dkt. #91) at 10. The parties submit that this term appears in Claim 10. *See* Prehearing Statement (Dkt. #86), Ex. B at 3.

a. The Parties' Positions

Plaintiff argues that "there can be no reasonable dispute that the words making up the phrase are readily understandable and thus require no special construction." Opening (Dkt. #87) at 9. Plaintiff urges that "[t]he intrinsic record . . . does not contain an express definition or a

disclaimer that would limit the claims" so as to limit the "image processor" to being a "digital signal processor," as Defendants have proposed. *Id.*[2]

Defendants respond that "the claim language establishes that the image processor must be a hardware component" and "*image* processors, by definition, must process *image* data." Response (Dkt. #91) at 11.

Plaintiff's reply and Defendants' sur-reply address this term together with the term "the sensor having a data interface circuit," which is discussed above. *See* Reply (Dkt. #96) at 4-6; Sur-Reply (Dkt. #98) at 2-3.

At the June 10, 2015 hearing, Defendants emphasized that unlike Claim 1, Claim 10 specifically recites a CMOS image sensor. Defendants reiterated that an "image processor" must be a specialized processor for processing image data.

b. Analysis

The Background of the Invention refers to an "image processor chip 52" that "includes a data processor 53 which performs various manipulations of the image data such as compression and color processing. The processor 53 may be software driven or a hardware embodiment." '290 Patent at 2:14-26; *see id.* at 1:16-34 ("CMOS imagers often have integrated analog to digital converters to convert the analog signal to a digital bit stream that can be processed by the companion chip. The digitized information then must be transferred to companion chip or other external devices for picture storage, processing, or transmission.").

[2] "[Defendants] initially proposed that an image processor is limited to a digital signal processor ('DSP'). While [Defendants] believe[] that the intrinsic evidence limits image processors to just DSPs, [Defendants] do[] not believe there are any issues in the case which will turn on whether the image processor is a generic processor or a DSP. For that reason and to narrow the issues for the Court, [Defendants] agree[] with [Plaintiff] that an image processor is not limited to a DSP." Response (Dkt. #91) at 10 n.5.

As to extrinsic evidence, Defendants have cited dictionaries that define "image processing" as meaning "Techniques for filtering, storing and retrieving images" (Response (Dkt. #91), Ex. E, *Larousse Dictionary of Science and Technology* 556 (1995)) and "The manipulation of images by computer" (*id.*, Ex. I, *The New IEEE Standard Dictionary of Electrical and Electronics Terms* 618 (5th ed. 1993)).

For substantially the same reasons set forth above as to the term "the sensor having a data interface circuit," the Court concludes that although an "image processor" might perhaps process signals *in addition to* image data signals, an "image processor" must *at least* process image data signals. But to whatever extent Defendants maintain that an "image processor" must be a distinct hardware component, the Court hereby expressly rejects any such interpretation. Nonetheless, at the June 10, 2015 hearing, the parties confirmed their mutual understanding that even in a software implementation, there must be some underlying hardware. Finally, to whatever extent Defendants are arguing that the "image processor" limitation cannot be met by an appropriately configured general-purpose processor, the Court hereby expressly rejects any such argument as lacking adequate support.

The Court therefore hereby construes **"an image processor connected to the CMOS image sensor to receive the signals output by the data interface circuit"** to mean **"a processor connected to the CMOS image sensor for processing image data received from the single-ended and the differential interfaces."**

DISPUTED CLAIM TERMS IN THE '029 PATENT

The '029 Patent, titled "Strobe Lighting System for Digital Images," issued on August 15, 2006, and bears an earliest priority date of March 24, 2000. Plaintiff submits:

> If a camera is used in a dark location, the captured photograph might appear too dark, or underexposed. A camera can compensate for the lack of light by using a flash. * * *

> "[P]reparatory light" is used to illuminate the scene and capture one or more "preparatory images." The camera measures the characteristics of these preparatory images, and determines how much light the flash, or supplemental strobe, should emit during actual capture of the picture. This results in a correctly exposed image that that [*sic*] is neither too bright nor too dark.

Opening (Dkt. #87) at 3-4. The Abstract of the '029 Patent states:

> An image sensor acquires a preparatory image that is lighted for a predetermined preparatory duration by a strobe. The preparatory image data corresponding to the preparatory image from the image sensor is processed and an average preparatory image luminance is determined based on the preparatory image data and weighting at least a subset of the preparatory image data. A supplemental strobe duration is generated based on the average preparatory image luminance and luminance weightings. The electronic image sensor may be activated to acquire an image with supplemental light provided by the supplemental strobe duration.

1. "preparatory light for a predetermined preparatory duration"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary Alternatively: "preparatory light emitted for an amount of time that is determined before emitting the light"	"preliminary strobe activation for a set duration"

Opening (Dkt. #87) at 12; Response (Dkt. #91) at 12. The parties submit that this term appears in Claims 1, 7, and 14. *See* Prehearing Statement (Dkt. #86), Ex. C at 1.

a. The Parties' Positions

Plaintiff argues that no construction is necessary because this term is "comprised of non-technical terms whose meanings are readily apparent." Opening (Dkt. #87) at 10. Plaintiff submits that Defendants' proposal of the word "set" implies a fixed duration, which Plaintiff argues is an unwarranted limitation. *Id.* at 11-12.

Defendants respond that "the patent makes clear that the preparatory light is from a strobe." Response (Dkt. #91) at 13. Defendants also urge that, "as [Plaintiff] implicitly concedes in its Brief, the 'preparatory light' during the 'preparatory duration' is emitted as a *preliminary* step (as [Defendants'] construction requires), *before* determination of the supplemental strobe duration and the firing of the main flash." *Id.* at 13-14 (citing Opening (Dkt. #87) at 11-12).

Plaintiff replies that neither the intrinsic evidence nor Defendants' extrinsic dictionary definition supports interpreting "predetermined" to mean "set" or "fixed." Reply (Dkt. #96) at 7.

In sur-reply, Defendants highlight that the title of the '029 Patent refers to a "strobe," and Defendants note that Plaintiff in its briefing has described the preparatory light as a strobe. Sur-Reply (Dkt. #98) at 3. Defendants also argue that Plaintiff has not explained how the recited duration could be adjustable. *Id.* at 4.

b. Analysis

Claim 1 of the '029 Patent is representative and recites (emphasis added):

> 1. A method of adjusting image lighting, the method comprising:
> generating a *preparatory light for a predetermined preparatory duration*;
> capturing a preparatory image while generating the preparatory light, wherein the preparatory image is represented by preparatory image data;
> determining an average preparatory image luminance of the preparatory image based on the preparatory image data and weighting at least a subset of the preparatory image data;
> generating a supplemental strobe duration based on the average preparatory image luminance and luminance weightings; and
> generating a look-up table storing associated image strobe durations and power values including a preparatory image strobe duration and associated preparatory power value.

The parties agree that a duration during which preparatory light is emitted is determined before emission of such light. *See* Response (Dkt. #91) at 14; *see also* '029 Patent at 9:54-10:3; *id.* at 7:5-9 ("In step 332 the activate strobe procedure 224 acquires a preparatory image while

generating preparatory light. To generate the preparatory light, the strobe is activated for a *predetermined* period of time, such as fifty microseconds.") (emphasis added).[3] The parties confirmed this mutual understanding at the June 10, 2015 hearing. Defendants also acknowledged at the June 10, 2015 hearing, however, that the predetermined preparatory duration need not be permanently fixed but rather could be different for a later photograph.

Finally, Defendants have not adequately demonstrated that the "preparatory light" must be generated by a "strobe." The Abstract of the '029 Patent refers to a "preparatory image that is lighted . . . by a strobe." In some cases, statements in an Abstract can lend support to a construction. *See Netcraft Corp. v. eBay, Inc.*, 549 F.3d 1394, 1398-99 (Fed. Cir. 2008). On balance, however, use of a "strobe" is a feature of particular embodiments that should not be imported into the claims. *See* '029 Patent at 7:57-60 ("In step 354, the activate strobe procedure 224 generates preparatory light by activating the strobe for a predetermined preparatory duration."); *see also Constant*, 848 F.2d at 1571; *Phillips*, 415 F.3d at 1323.

At the June 10, 2015 hearing, Defendants noted that Claim 1 itself recites a "supplemental *strobe*." If anything, however, this recital of a strobe in Claim 1 suggests that the term "preparatory light" can mean something other than a "strobe." *See, e.g., CAE Screenplates, Inc. v. Heinrich Fiedler GmbH & Co. KG*, 224 F.3d 1308, 1317 (Fed. Cir. 2000) ("we must presume that the use of . . . different terms in the claims connotes different meanings").

The Court therefore hereby construes **"preparatory light for a predetermined preparatory duration"** to mean **"preparatory light emitted for an amount of time that is determined before emitting the light."**

[3] Also of note, Plaintiff has cited an extrinsic dictionary that defines "predetermined" as meaning "establish[ed] or decide[d] in advance" and "preparatory" as meaning "serving as or carrying out preparation for a task or undertaking." Opening (Dkt. #87), Ex. 5, *The New Oxford American Dictionary* 1342, 1346 (2001).

2. "a preparatory image"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"one or more images acquired using preparatory light"	Plain and ordinary meaning. Alternatively: "an image produced by preparatory light"

Opening (Dkt. #87) at 14; Response (Dkt. #91) at 14. The parties submit that this term appears in Claims 1, 7, and 14. *See* Prehearing Statement (Dkt. #86), Ex. C at 2.

a. The Parties' Positions

Plaintiff argues that whereas its proposal comports with the rule that "a" means "one or more," Defendants' proposal improperly limits the disputed term to a single image. Opening (Dkt. #87) at 13. Plaintiff also submits that "[t]he claims and the specification state over and over again that a preparatory image is captured, or 'acquired,' through the use of a preparatory light." *Id.* at 14.

Defendants respond that Plaintiff's proposed construction "adds unnecessary redundancy ('acquired using preparatory light') and superfluous content ('one or more') to a term that is understandable to one of skill in the art." Response (Dkt. #91) at 15.

Plaintiff replies by reiterating that Defendants have not justified departing from the usual rule that "a" means "one or more." Reply (Dkt. #96) at 8.

In sur-reply, Defendants argue that the disclosure regarding capturing multiple images for calibration purposes is not relevant to capturing a preparatory image. Sur-Reply (Dkt. #98) at 4. Defendants urge that "[Plaintiff] is attempting to use intrinsic evidence regarding a *different* procedure pertaining to *different* limitations in *unasserted* claims to unnecessarily construe a term with clear meaning." *Id.* at 5.

b. Analysis

Claim 1 of the ’029 Patent is representative and is quoted in the discussion of the term “preparatory light for a predetermined preparatory duration,” above.

The indefinite article “‘[a]’ or ‘an’ in patent parlance carries the meaning of ‘one or more’ in open-ended claims containing the transitional phrase ‘comprising.’” *Free Motion Fitness, Inc. v. Cybex Int’l, Inc.*, 423 F.3d 1343, 1350 (Fed. Cir. 2005) (“Cybex argues that here the presumption is overcome because the specification describes the cable as a ‘single cable.’ We disagree. The references to a single cable in the specification are found in the description of the preferred embodiments, and do not evince a clear intent by the patentee to limit the article to the singular.”); *accord Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008) (“That ‘a’ or ‘an’ can mean ‘one or more’ is best described as a rule, rather than merely as a presumption or even a convention. The exceptions to this rule are extremely limited: a patentee must ‘evince[ ] a clear intent’ to limit ‘a’ or ‘an’ to ‘one.’”) (citation omitted).

Defendants have not shown that the patentee limited “a” so as to mean only “one.” To whatever extent Defendants maintain that the claims at issue are limited to using one and only one preparatory image, the Court hereby expressly rejects any such argument as lacking adequate support. In particular, such a feature should not be imported from the disclosed embodiments. *See Constant*, 848 F.2d at 1571; *see also Phillips*, 415 F.3d at 1323. To whatever extent Defendants are arguing that the specification does not explain how to make use of more than one preparatory image, such an argument perhaps might pertain to enablement but is not relevant to

these claim construction proceedings. *See Phillips*, 415 F.3d at 1327 ("[W]e have certainly not endorsed a regime in which validity analysis is a regular component of claim construction.").[4]

Because no other substantive disputes are apparent, no further construction is necessary. *See U.S. Surgical*, 103 F.3d at 1568; *see also O2 Micro*, 521 F.3d at 1362; *Finjan*, 626 F.3d at 1207.

The Court accordingly hereby construes **"a preparatory image"** to have its **plain meaning**.

3. "average image luminance"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Not indefinite; no construction necessary Alternatively: "average luminance of the preparatory image"	Indefinite for lack of antecedent basis

Opening (Dkt. #87) at 15; Response (Dkt. #91) at 16; Prehearing Statement (Dkt. #86), Ex. C at 2. The parties submit that this term appears in Claim 6. *See id.*

a. The Parties' Positions

Plaintiff argues that "[a] person skilled in the art would recognize that the 'average image luminance' in claim 6 refers back to the 'average preparatory image luminance' recited in claim 1." Opening (Dkt. #87) at 14-15.

[4] As to the below-addressed "supplemental strobe duration" terms, Defendants have cited prosecution history in which the patentee stated that "the generation of the supplemental strobe duration is performed using a *single preparatory image* captured while generating the preparatory light." Response (Dkt. #91), Ex. L, 4/28/2005 Amendment and Response to Non-Final Office Action at 16 (emphasis added); *see id.* at 17 & 18 (similar). The claim language at issue, however, expressly recited using a "single preparatory image." *See id.* at 2, 4 & 8. The word "single" does not appear in the claims now at issue, namely Claims 1, 7, and 14 of the issued '029 Patent. Instead, that limitation appears in dependent Claims 26, 27, and 28, which depend from Claims 1, 7, and 14, respectively.

Defendants respond that "the term 'average image luminance' is open to multiple interpretations, and thus there can be no implicit antecedent basis providing the requisite 'reasonable certainty.'" Response (Dkt. #91) at 16. Defendants explain that "a person of ordinary skill in the art could interpret 'average image luminance' in claim 6 to mean any of: (1) the 'average calibration luminance;' (2) the 'average nominal luminance;' (3) the 'target luminance' average; or (4) the 'weighted image average luminance,' because accessing the look-up table is based, in part, on each of these distinct 'average' values." *Id.* at 18 (citing '029 Patent at 9:12-25, 10:15-18 & 10:60-67).

Plaintiff replies by reiterating that "'average image luminance' has an implied antecedent basis." Reply (Dkt. #96) at 9. Plaintiff also submits that whereas the specification discloses measuring luminance characteristics of preparatory images, no such measuring occurs for final images. *Id.* at 9-10.

In sur-reply, Defendants argue that "as the specification makes clear, each of the four types of average image luminances identified by [Defendants] correspond to different 'images': 'average calibration luminance' to images taken during power value calibration; 'average nominal luminance' to images taken during preparatory power value calibration; 'target luminance average' to final photographic images; and 'weighted image average luminance' to preparatory images." Sur-Reply (Dkt. #98) at 5 (footnote omitted). Defendants urge that "given the multiple contexts in which the look-up table is accessed, a person of ordinary skill could not know with reasonable certainty which of these four identified average image luminances is the basis for any one type of access." *Id.* at 5-6.

At the June 10, 2015 hearing, Plaintiff cited a recent *Apple Inc. v. Samsung Electronics Co., Ltd.* decision in which the Court of Appeals for the Federal Circuit rejected an indefiniteness

argument as lacking supporting evidence. --- F.3d ----, 2015 WL 2343543, at *14 (Fed. Cir. May 18, 2015). In response, Defendants reiterated their arguments and also argued that Plaintiff's interpretation must be incorrect because the "average image luminance" recited in dependent Claim 8 is not necessarily the "average preparatory image luminance."

b. Analysis

The disputed term appears in Claim 6, which depends from Claim 1. Claims 1 and 6 of the '029 Patent recite (emphasis added):

> 1. A method of adjusting image lighting, the method comprising:
> generating a preparatory light for a predetermined preparatory duration;
> capturing a preparatory image while generating the preparatory light, wherein the preparatory image is represented by preparatory image data;
> determining *an average preparatory image luminance* of the preparatory image based on the preparatory image data and weighting at least a subset of the preparatory image data;
> generating a supplemental strobe duration based on *the average preparatory image luminance* and luminance weightings; and
> generating a look-up table storing associated image strobe durations and power values including a preparatory image strobe duration and associated preparatory power value.
>
> * * *
>
> 6. The method of claim 1 further comprising:
> accessing the look-up table based on *the average image luminance*.

Defendants argue that "[Plaintiff's] argument conflates 'average *image* luminance' and 'average *preparatory image* luminance.' These are generally two separate (though overlapping) concepts, as their plain language makes clear -- 'average image luminance' relates to the luminance of the image and 'average *preparatory image* luminance' relates to the luminance of the *preparatory* image." Response (Dkt. #91) at 17. On one hand, "[w]hen different words or phrases are used in separate claims, a difference in meaning is presumed." *Nystrom v. TREX Co., Inc.*, 424 F.3d 1136, 1143 (Fed. Cir. 2005).

On the other hand, as reproduced above, the only type of image luminance recited in the body of Claim 1 is preparatory image luminance. On balance, a person of ordinary skill in the art would understand that "the average image luminance" in dependent Claim 6 has antecedent basis in the "average preparatory image luminance" recited in independent Claim 1. *See Energizer Holdings Inc. v. Int'l Trade Comm'n*, 435 F.3d 1366, 1371 (Fed. Cir. 2006) (holding that "an anode gel comprised of zinc as the active anode component" provided implicit antecedent basis for "said zinc anode"); *see also Ex Parte Porter*, 25 U.S.P.Q.2d 1144, 1145 (B.P.A.I. 1992) ("The term 'the controlled fluid' . . . finds reasonable antecedent basis in the previously recited 'controlled stream of fluid . . . .'"). Defendants' above-noted argument as to Claim 8 is unpersuasive at least because here the parties' dispute pertains specifically to antecedent basis as to Claims 1 and 6.

The Court therefore hereby construes **"average image luminance"** in Claim 6 to mean **"average preparatory image luminance."** The Court accordingly hereby expressly rejects Defendants' indefiniteness argument.

4. "weighting table that stores the luminance weighting"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Not indefinite; no construction necessary Alternatively: "luminance weighting table that stores the luminance weighting"	Indefinite for lack of antecedent basis

Opening (Dkt. #87) at 16; Response (Dkt. #91) at 19; Prehearing Statement (Dkt. #86), Ex. C at 2. The parties submit that this term appears in Claim 16. *See id.*

At the June 10, 2015 hearing, the parties submitted that they have reached agreement that this term should be construed to have its plain and ordinary meaning. Defendants are no longer arguing indefiniteness as to this term.

The Court accordingly hereby construes **"weighting table that stores the luminance weighting"** to have its **plain meaning**.

5. "generating a supplemental strobe duration" / "supplemental strobe duration stored in the memory is generated"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Not indefinite; no construction necessary	Indefinite. If the Court determines that this term requires construction: "generating a supplemental strobe duration, using a single preparatory image," or "supplemental strobe duration stored in memory is generated using a single preparatory image"

Opening (Dkt. #87) at 18; Response (Dkt. #91) at 20. The parties submit that these terms appear in Claims 1, 7, and 14. *See* Prehearing Statement (Dkt. #86), Ex. C at 2-3.

Plaintiff argued that "[t]he claims are not limited to any particular method of generating a supplemental strobe duration. A person of ordinary skill in the art would . . . understand that any method of generating a supplemental strobe duration would suffice." Opening (Dkt. #87) at 16. Further, Plaintiff argued, "neither the language of the claims or the specification requires that only a single preparatory image can be used, or that multiple preparatory images cannot be used." *Id.* at 17.

Defendants responded that "[t]he multiple plausible (but very different) meanings for these terms fail the 'reasonable certainty' test for indefiniteness. . . . For example, it could mean either *determining* the duration of the supplemental strobe or *actually activating* the strobe."

Response (Dkt. #91) at 21 (footnotes omitted). Defendants also urged that, during prosecution, "the applicants clearly disavowed using more than a single preparatory image to generate the supplemental strobe duration." *Id.* at 22. Defendants also emphasized that "[t]he patent makes no mention of a first and second preparatory image." *Id.* at 23.

Plaintiff replied that "[t]he term states that a 'duration' is generated, not that a 'strobe' is generated or 'activated.' . . . When the specification discusses activation of the strobe, the specification explicitly uses the word 'activating.'" Reply (Dkt. #96) at 12. As to the prosecution history, Plaintiff replied that "[t]he prosecution statements on which [Defendants] rel[y] were made with respect to different claims, not the claims that issued in the '029 patent," and "[t]he examiner ultimately allowed the claims without the limitation of a 'single' preparatory image." *Id.* at 13-14.

In sur-reply, Defendants submit: "While [Defendants] believe[] that these terms are indefinite and that, if the terms are construed, [Defendants'] construction is technically more accurate, to narrow the issues for the Court, [Defendant] will agree to [Plaintiff's] proposed 'plain and ordinary meaning' reading." Sur-Reply (Dkt. #98) at 6.

Thus, as now agreed upon by the parties, the Court hereby construes **"generating a supplemental strobe duration"** and **"supplemental strobe duration stored in the memory is generated"** to have their **plain meaning**.

DISPUTED CLAIM TERMS IN THE '884 PATENT

The '884 Patent, titled "Image Flicker Reduction With Fluorescent Lighting," issued on August 7, 2001, and bears a filing date of September 28, 1999.

Recorded video can flicker (or contain bands of light) because the light gathered to create each frame (or certain portions of a frame) may be gathered during different parts of the flicker cycle of the fluorescent lighting. One way to avoid flicker is to set the integration time of the

sensor equal to a so-called "integral multiple" of the period of the flicker. For example, in a 50 Hz electrical system, each period of the flicker cycle lasts 10 milliseconds (ms). If the integration time is set to 10 ms, then regardless of timing the sensor will in total capture one full 10 ms flicker cycle of light. Similarly, setting the integration time to 20 ms means that the sensor captures two full flicker cycles, and so on.

The '884 Patent refers to such multiples of the integration time as "integral multiples." Figure 3A is illustrative, and the associated description in the specification explains that "the amount of light captured is independent of where in the cycle of the light output 202 the integration begins." '884 Patent at 4:38-40. Figure 3A is reproduced here:

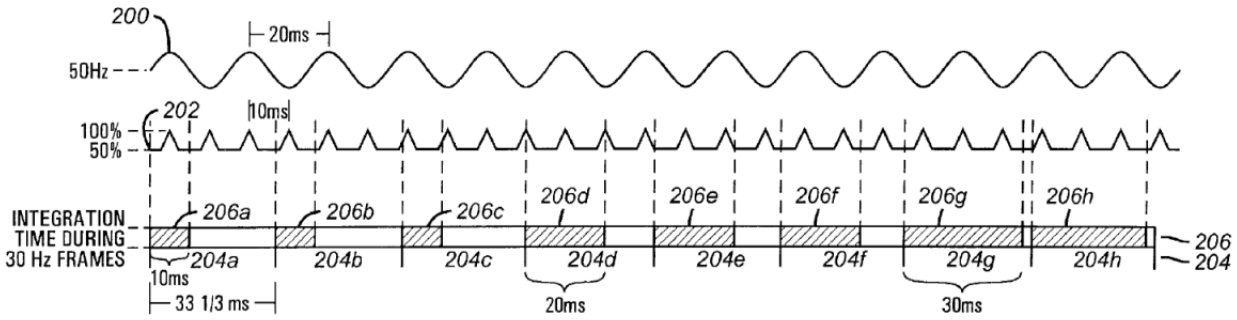

FIG. 3A

The '884 Patent further discloses that gain can be adjusted to account for the change in integration time that was necessary to avoid flicker. *Id.* at 5:49-6:9.

The Abstract of the '884 Patent states:

> An imager reduces lighting induced flicker by setting its pixel integration time to an integral multiple of the periods between peak intensity of the lighting. In one implementation, flicker is reduced in a 30 Hz frame rate camera capturing an image lighted with 50 Hz lighting by setting the integration time to approximately 10 ms, the period between lighting intensity peaks.

The parties have agreed that, in the '884 Patent, "integration time" means "the amount of time that a pixel is allowed to gather light before that pixel is read," and "overall system gain"

means "the ratio of the output signal of the entire system to the input signal to entire system." Prehearing Statement (Dkt. #86) at 2.

1. "adjusting the overall system gain by adjusting the integration time"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"adjusting the overall system gain by the determined amount, or a fraction of the determined amount, by adjusting the integration time"	"adjusting the overall system gain by the determined amount by adjusting the integration time"[5]

Opening (Dkt. #87) at 19; Response (Dkt. #91) at 25. The parties submit that this term appears in Claim 1. *See* Prehearing Statement (Dkt. #86), Ex. A at 1.

In *Imperium I*, the Court initially construed this disputed term to mean "adjusting the overall system gain by the determined amount by adjusting the integration time." *Imperium I*, Dkt. #209 at 15. After further proceedings, the Court construed this disputed term to mean "adjusting the overall system gain by an amount as close to the determined amount as can be accomplished by adjusting the integration time." *See id.*, Dkt. #401 at 3-5.

a. The Parties' Positions

Plaintiff argues that, "[a]s the Court explained in [*Imperium I*], the specification provides that overall system gain may be adjusted by the determined amount through a combination of 'coarse' adjustments—such as adjusting integration time—and 'fine' adjustments—such as amplification and digital gamma correction." Opening (Dkt. #87) at 18.

Defendants respond that Plaintiff's proposed construction "is inconsistent with the intrinsic evidence and is irreconcilable with the plain language of the claims." Response

[5] Defendants previously proposed: "*changing* the overall system gain by the determined amount by *changing* the integration time." Prehearing Statement (Dkt. #86), Ex. A at 1 (emphasis added). Defendants now "agree[] that 'adjusting' does not require construction." Response (Dkt. #91) at 25 n.18.

(Dkt. #91) at 25. Defendants argue that "[i]ncluding 'the determined amount' as part of the construction is necessary to provide context for (and to provide consistency with) the 'determining' step recited earlier in the claim." *Id.* at 26. Further, Defendants submit, "Claim 1 is not directed to amplification or digital gamma correction," "[a]nd there is nothing in the plain words of Claim 1 about fractional adjustments." *Id.* at 27.

Plaintiff replies that "[b]ecause the integration time can only be adjusted in 'coarse' steps (e.g., 10 ms, 20 ms, 30 ms), the Court properly determined that it may be impossible to adjust the overall system gain 'by the determined amount' by only adjusting the integration time." Reply (Dkt. #96) at 15. Plaintiff submits that its proposed construction "therefore accounts for the fact that," in some situations, "the integration time can be used to adjust the overall system gain by a fraction of the determined amount" and "other parameters (e.g., amplification and digital gamma correction) can be used to make 'fine' adjustments to the overall system gain, so as to adjust the overall system gain by the remaining amount." *Id.* at 15-16.

In sur-reply, Defendants argue that whereas their proposal "tracks the exact language of the 'adjusting' method step and properly makes reference to the preceding step with respect to the determined amount of adjustment," Plaintiff's argument is "a thinly-disguised doctrine of equivalents argument." Sur-Reply (Dkt. #98) at 7.

b. Analysis

Claim 1 of the '884 Patent recites (emphasis added):

> 1. A method of reducing flicker caused by lighting having a periodic intensity using an imager having a pixel integration time, the method comprising the steps of:
>
> setting the integration time to an integral multiple of the period of the periodic intensity of the lighting;
>
> *determining an amount to vary an overall system gain*; and

> *adjusting the overall system gain by adjusting the integration time* while maintaining the integration time at an integral multiple of the period of the periodic intensity.

In *Imperium I*, the Court found:

> The third step of Claim 1 describes the "coarse" adjustment achieved by adjusting the integration time to a multiple of the period of peak intensity. This does not mean that this coarse adjustment must exactly equal the "amount to vary" that was determined in the second step of the claim. One could logically use the coarse adjustment feature to get as close as possible, and then make finer adjustments with the amplifier or the color and gamma correction block. And, there is no reason to say that Claim 1 could not read on a method that used only the coarse adjustment of adjusting the integration time, even if such a method is at a competitive disadvantage with more sophisticated systems that allow further fine adjustments.

Imperium I, Dkt. #401 at 3-4; *see* '884 Patent at 5:52-57 ("In the disclosed embodiment, brightness is adjusted most coarsely by setting the integration time via the registers 312. Using a 30 Hz (or any other) frame rate with 50 Hz lighting, the integration times can be set to approximately 10 milliseconds, 20 milliseconds, or 30 milliseconds as illustrated in FIG. 3a. This provides three levels of intensity control . . . .").

Plaintiff argues that its proposal is consistent with the *Imperium I* findings. Opening (Dkt. #87) at 18. Defendants argue that Plaintiff's proposal "could potentially cover circumstances where even a miniscule fraction of the determined amount of adjustment is accomplished by varying the integration time. That is inconsistent with the [*Imperium I*] construction and [Plaintiff's] own argument that 'coarse' adjustments are accomplished by varying the integration time and 'fine' adjustments are accomplished in other ways." Response (Dkt. #91) at 28.

On balance, neither side has justified departing from the *Imperium I* construction or demonstrated that the parties have a substantive dispute requiring any additional construction. *See Imperium I*, Dkt. #401 at 3-4 (quoted above); *see also Maurice Mitchell Innovations*, 2006

WL 1751779, at *4; *TQP Development, LLC v. Inuit Inc.*, No. 2:12-CV-180, 2014 WL 2810016, at *6 (E.D. Tex. June 20, 2014) (Bryson, J.) ("[P]revious claim constructions in cases involving the same patent are entitled to substantial weight, and the Court has determined that it will not depart from those constructions absent a strong reason for doing so.").

Instead, Defendants' concerns are adequately addressed by Plaintiff's acknowledgement in its reply brief that adjusting integration time is a relatively coarse adjustment and adjusting amplification and gamma correction are relatively fine adjustments. *See* Reply (Dkt. #96) at 15-16 ("the integration time can only be adjusted in 'coarse' steps"; "other parameters (e.g., amplification and digital gamma correction) can be used to make 'fine' adjustments").

The Court therefore hereby construes **"adjusting the overall system gain by adjusting the integration time"** to mean **"adjusting the overall system gain by an amount as close to the determined amount as can be accomplished by adjusting the integration time."**

2. Preambles of Claims 1 and 14

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Not limiting	The preambles are limitations because they provide antecedent basis for terms that appear in the body of the claim.

Opening (Dkt. #87) at 20; Response (Dkt. #91) at 29.

In *Imperium I*, the Court found that the preambles of Claims 1 and 14 are not limiting. *See Imperium I*, Dkt. #209 at 6-8.

a. The Parties' Positions

Plaintiff argues that "[a]s the Court explained in *Imperium I*, the terms in the preambles recite the purpose of the invention, but are not essential to understanding the meaning of the claims." Opening (Dkt. #87) at 20 (italics added).

Defendants respond that "a substantial amount of the preamble language provides antecedent basis for several later-recited limitations (for example, the preamble phrases 'lighting,' 'periodic intensity' and 'integration time' provide such antecedent basis)." Response (Dkt. #91) at 29.

Plaintiff replies that "[t]he fact that the preamble provides antecedent basis for a term, alone, does not make the preamble limiting." Reply (Dkt. #96) at 16. Here, Plaintiff argues, "the [claim] bodies indisputably set out a complete invention." *Id.* at 17.

In sur-reply, Defendants reiterate that "[Plaintiff] should not be permitted . . . to expand the scope of its infringement allegations by ignoring the unambiguous preamble language that provides . . . antecedent basis." Sur-Reply (Dkt. #98) at 7.

b. Analysis

> In general, a preamble limits the invention if it recites essential structure or steps, or if it is necessary to give life, meaning, and vitality to the claim. . . . [A] preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.

Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 808 (Fed. Cir. 2002) (citation and internal quotation marks omitted).

Claims 1 and 14 of the '884 Patent recite (emphasis added):

> 1. A method of reducing flicker caused by *lighting having a periodic intensity* using an imager having *a pixel integration time*, the method comprising the steps of:
>
> setting *the integration time* to an integral multiple of *the period of the periodic intensity of the lighting*;
>
> determining an amount to vary an overall system gain; and
>
> adjusting the overall system gain by adjusting *the integration time* while maintaining *the integration time* at an integral multiple of *the period of the periodic intensity*.
>
> * * *

> 14. An imager for a digital camera with reduced flicker caused by *lighting having a periodic intensity*, the imager providing data for a plurality of pixels, the imager comprising:
>
> programmable integration time circuitry that controls an integration time of the plurality of pixels;
>
> an integration time adjustment block coupled to the programmable integration time circuitry, the integration time adjustment block setting the integration time to an integral multiple of *the period of the periodic intensity of the lighting*; and
>
> an overall gain control block that adjusts an overall system gain by adjusting the integration time while maintaining the integration time at an integral multiple of the period of the periodic intensity.

On one hand, "[w]hen limitations in the body of the claim rely upon and derive antecedent basis from the preamble, then the preamble may act as a necessary component of the claimed invention." *Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003).

On the other hand, in *Imperium I* the Court found the preambles not limiting because "the 'reducing flicker' purpose is not 'necessary to give life, meaning, and vitality' to the claims because 'the periodic intensity of the lighting' is adequately addressed in the body of the claims." *Imperium I*, Dkt. #209 at 8 (citing *Catalina Mktg.*, 289 F.3d at 808); *see Symantec Corp. v. Computer Assocs. Int'l, Inc.*, 522 F.3d 1279, 1288-89 (Fed. Cir. 2008) ("[I]n general, the purpose of a claim preamble is to give context for what is being described in the body of the claim; if it is reasonably susceptible to being construed to be merely duplicative of the limitations in the body of the claim (and was not clearly added to overcome a rejection), we do not construe it to be a separate limitation.").

On balance, Defendants have not adequately justified departing from the conclusion reached in *Imperium I*. The Court therefore hereby expressly rejects Defendants' proposal that the preambles are limiting.

3. "gamma correction"

Plaintiff submits that the parties have reached agreement that this term, which the parties submit appears in Claim 17, should be given its plain and ordinary meaning. Opening (Dkt. #87) at 20; *see* Prehearing Statement (Dkt. #86), Ex. B at 4.

Defendants respond that although "the term does not require construction at this point in the proceedings, 'gamma correction' is an issue that will need to be addressed at trial through expert testimony." Response (Dkt. #91) at 30. Defendants identify an extrinsic dictionary definition of "gamma correction" as meaning "[t]he insertion of a nonlinear output-input characteristic for the purpose of changing the system transfer characteristic." *Id.* (citing *id.*, Ex. I, *The New IEEE Standard Dictionary of Electrical and Electronics Terms* 547 (1993)).

Plaintiff replies that "[t]he intrinsic record does not contain an express definition or a disclaimer that would limit the claims in such a manner . . . ." Reply (Dkt. #96) at 18. "Here," Plaintiff argues, "the specification does not reduce gamma correction to any particular type of gamma correction, much less the specific mathematical concept proposed by [Defendants]." *Id.*

In sur-reply, Defendants submit that reference to extrinsic evidence is appropriate because "the phrase 'gamma correction' has no meaning to a lay juror" and "[t]he meaning of 'gamma correction' is not evident from the intrinsic evidence." Sur-Reply (Dkt. #98) at 8. Defendants conclude:

> It appears that [Plaintiff] now seeks to take refuge in the "plain and ordinary meaning" so that it can tell the jury that "gamma correction" means whatever suits its purposes at the time of trial. Nonetheless, [Defendants are] hopeful that expert discovery will confirm how a skilled worker understands "gamma correction" in the context of the '884 patent and that it will not be necessary to request the Court's involvement in addressing this issue.

Id.

Also of note, "gamma correction" is not presented as a disputed term in the parties' May 27, 2015 Joint Claim Construction Chart Pursuant to P.R. 4-5(d) (Dkt. #99).

On balance, the parties' dispute appears to amount to whether particular features of accused instrumentalities are "gamma correction" according to the plain meaning of that term to a person of ordinary skill in the art. *See PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) ("[A]fter the court has defined the claim with whatever specificity and precision is warranted by the language of the claim and the evidence bearing on the proper construction, the task of determining whether the construed claim reads on the accused product is for the finder of fact."); *see also U.S. Surgical*, 103 F.3d at 1568; *O2 Micro*, 521 F.3d at 1362.

The Court accordingly hereby construes **"gamma correction"** to have its **plain meaning**.

CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit. The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 16th day of June, 2015.

AMOS L. MAZZANT
UNITED STATES DISTRICT JUDGE