IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

CAPELLA PHOTONICS, INC., *Plaintiff,* v. FUJITSU NETWORK COMMUNICATIONS, INC., *Defendant.*	Case No. 2:20-cv-00076-JRG
CAPELLA PHOTONICS, INC., *Plaintiff,* v. INFINERA CORPORATION, TELLABS, INC., TELLABS OPERATIONS INC., CORIANT AMERICA INC., AND CORIANT (USA) INC., *Defendants.*	Case No. 2:20-cv-00077-JRG

CLAIM CONSTRUCTION MEMORANDUM OPINION AND ORDER

This Order addresses the claim-construction disputes presented by the parties in Case No. 2:20-cv-00076-JRG (the "'076 Case") and Case No. 2:20-cv-00077-JRG (the "'077 Case"). Before the Court are the opening claim construction briefs of Capella Photonics, Inc. ("Plaintiff") ('076 Case Dkt. No. 56 and '077 Case Dkt. No. 72, respectively filed on December 8 and 9, 2020),[1] the responses of Fujitsu Network Communications, Inc., Infinera Corporation, Tellabs, Inc., Tellabs Operations Inc., Coriant America Inc., and Coriant (USA) Inc. (collectively "Defendants") ('076 Case Dkt. No. 62 and '077 Case Dkt. No. 80, both filed on December 22, 2020), and Plaintiff's

[1] Citations to the parties' filings are to the filing's number in the docket (Dkt. No.) and pin cites are to the page numbers assigned through ECF. Substantially the same briefs and exhibits were submitted in both cases. For simplicity, the Court cites only the '077 Case submissions.

replies (’076 Case Dkt. No. 64 and ’077 Case Dkt. No. 83, both filed on January 4, 2021). The Court held a hearing on the issues of claim construction and claim definiteness on January 22, 2021. Having considered the arguments and evidence presented by the parties at the hearing and in their briefing, the Court issues this Order.

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I. BACKGROUND

Plaintiff alleges infringement of two U.S. Patents: No. RE47,905 (the "'905 Patent") and No. RE47,906 (the "'906 Patent") (collectively, the "Asserted Patents"). The '905 and '906 Patents are related through continuation applications and share a substantially identical specification, outside the claim set.[2] Each patent lists an earliest priority date of March 19, 2001.

Each of the patents has been subject to a series of *Inter Partes* Reviews (IPR) and Reissue proceedings. U.S. Patent No. RE42,368 (the parent of the '905 Patent) was the subject of at least six IPR proceedings: IPR2014-01166, IPR2015-00816, IPR2015-00726, IPR2015-01958, IPR2015-00731, and IPR2015-01969. Claims 1–6, 9–13, and 15–22 were cancelled because of these proceedings. U.S. Patent No. RE42,678 (the parent of the '906 Patent) was the subject of at least six IPR proceedings: IPR2014-01276, IPR2015-00894, IPR2015-00727, IPR2015-01961, IPR2015-00739, IPR2015-01971. Claims 1–4, 9, 10, 13, 17, 19–23, 27, 29, 44–46, 53, and 61–65 were cancelled because of these proceedings. In all IPR proceedings, the Broadest Reasonable Interpretation claim-construction standard applied. The IPR decisions were summarily affirmed by the Federal Circuit. *Capella Photonics, Inc. v. Cisco Sys.*, 711 F. App'x 642, 643 (Fed. Cir. 2018), *cert. denied* 139 S. Ct. 462 (2018). The IPR invalidity rulings were addressed in Reissue proceedings. The '905 Patent is a reissue of U.S. Patent No. RE42,368 (which is a reissue of U.S. Patent No. 6,879,750 which is a continuation of U.S. Patent No. 6,687,431 which is a continuation of U.S. Patent No. 6,625,346). The '906 Patent is a reissue of U.S. Patent No. RE42,678 (which is a reissue of U.S. Patent No. RE39,397 which is a reissue of U.S. Patent No. 6,625,346).

[2] For simplicity, the Court cites the '905 Patent with the understanding that the cited material is also in the '906 Patent.

In general, the Asserted Patents are directed to technology for wavelength-division multiplexing (WDM) in optical communication systems. The technology can be generally understood with reference to Figure 2A of the patents, reproduced and annotated below. An exemplary wavelength-separating-routing (WSR) apparatus includes an input port (110-1), a number of output ports (110-2 – 110-N), a one-dimensional array of collimator-alignment mirrors that correspond to the ports (array 220, mirrors 220-1 – 220-N), a wavelength-separating diffraction grating (101), a quarter-wave plate (104), a beam-focusing lens (102), and an array of channel micromirrors (103). An optical signal (in blue) enters through the input port, reflects off the collimator-alignment mirror (220-1) that corresponds to the input port, and is incident upon the diffraction grating. The diffraction grating spatially separates the optical signal into various wavelengths (in red, green, violet), each forming a spectral channel. The various spectral channels are separately focused (via the beam-focusing lens) on the array of channel micromirrors such that each channel micromirror receives one of the spectral channels. Each separated spectral channel is reflected back through the lens, diffraction grating, and a collimator-alignment mirror and out through the corresponding output port. '905 Patent col.6 l.59 – col.7 l.29, col.9 l.57 – col.10 l.10.

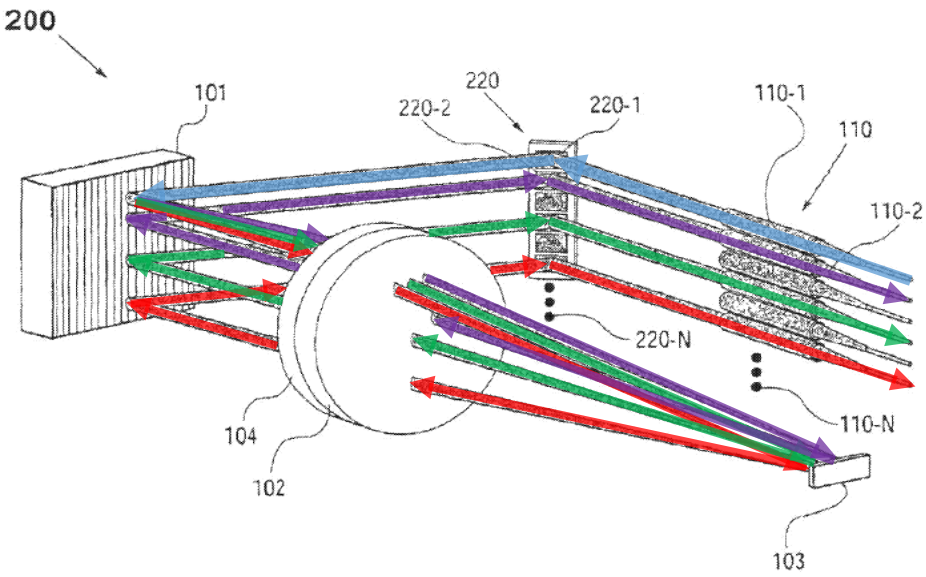

Fig. 2A

The exemplary array of channel micromirrors (103) is further described with respect to Figure 1B, reproduced and annotated below. As depicted, the reflective surface of each channel micromirror lies in an x-y plane and the micromirrors are arranged such that each micromirror receives one of the focused, spatially separated, spectral channels (in red, green, violet). The micromirrors are movable such that the spectral channels reflected off the micromirrors may be directed to one of the output ports. For example, the micromirrors may be independently pivotable about the x-axis, enabling controlled deflection of the corresponding spectral channel in the y-axis. *Id*. at col.8 ll.22–37.

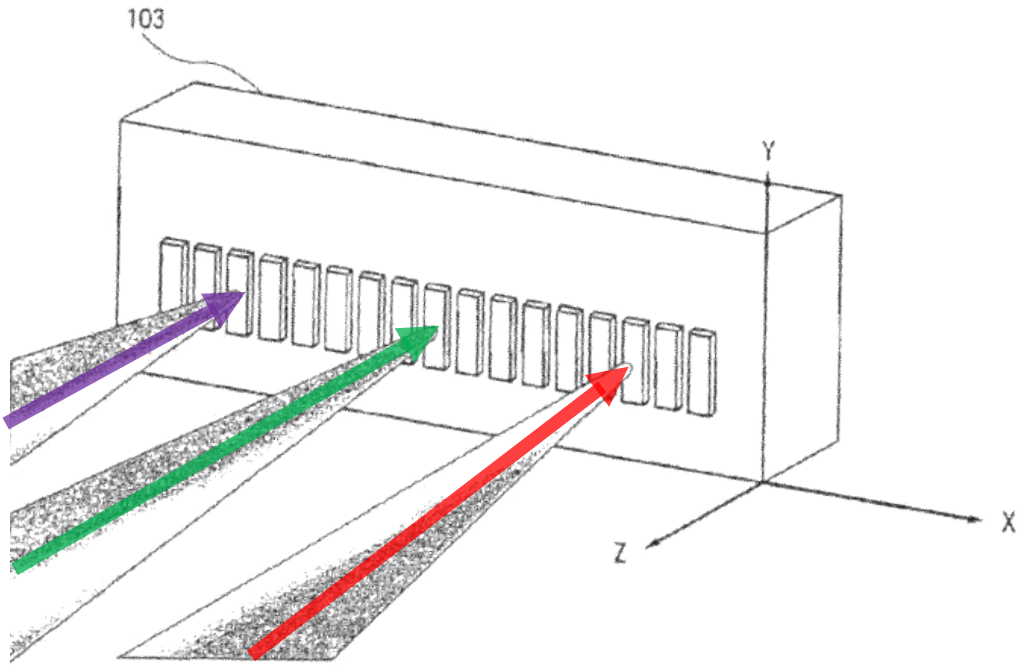

Fig. 1B

The abstracts of the Asserted Patents are almost identical. The '905 Patent's abstract provides (emphasis added):

> This invention provides a novel wavelength-separating-routing (WSR) apparatus that uses a diffraction grating to separate a multi-wavelength optical signal by wavelength into multiple spectral ***channels***, which are then focused onto an array of corresponding channel micromirrors. The channel micromirrors are individually controllable and continuously pivotable to reflect the spectral channels into selected output ports. As such, the inventive WSR apparatus is capable of routing the spectral channels on a channel-by-channel basis and coupling any spectral channel into any one of the output ports. The WSR apparatus of the present invention may be further equipped with servo-control and spectral power-management capabilities, thereby maintaining the coupling efficiencies of the spectral channels into the output ports at desired values. The WSR apparatus of the present invention can be used to construct a novel class of dynamically reconfigurable optical add-drop multiplexers (OADMs) for WDM optical networking applications.

The '906 Patent's abstract differs only in that the first reference to "channels" in the '905 Patent's abstract (emphasized above) is replaced with "characters."

Claim 1 of the '905 Patent, an exemplary apparatus claim cancelled as a result of the IPR proceedings, recites as follows:

> 1. An optical add-drop apparatus comprising
> an input ***port*** for an input multi-wavelength optical signal having first spectral channels;
> one or more other ***ports*** for second spectral channels;
> an output ***port*** for an output multi-wavelength optical signal;
> a wavelength-selective device for spatially separating said spectral channels;
> a spatial array of ***beam-deflecting elements*** positioned such that each element receives a ***corresponding*** one of said spectral channels, each of said elements being ***individually and continuously controllable in two dimensions*** to reflect its corresponding spectral channel to a selected one of said ports and to control the power of the spectral channel reflected to said selected port.

'905 Patent col.14 ll.29–43 (original emphasis omitted; bold-italic emphasis added to denote terms in dispute). Claim 23 of the '905 Patent, which was added in the reissue of the '905 Patent, recites as follows:

> 23. An optical add-drop apparatus comprising an output port and fiber collimators serving as an input port and one or more other ports, the apparatus comprising:

> the fiber collimator input ***port*** for an input multi-wavelength optical signal having first spectral channels;
> the fiber collimator one or more other ***ports*** for second spectral channels;
> the output ***port*** for an output multi-wavelength optical signal;
> a wavelength-selective device for spatially separating said spectral channels;
> a spatial array of ***beam-deflecting elements*** positioned such that each element receives a ***corresponding*** one of said spectral channels, each of said elements being ***individually and continuously controllable in two dimensions*** to reflect its corresponding spectral channel to a selected one of said output port or the fiber collimator ports and to control the power of the spectral channel reflected to said output port or the fiber collimator selected port.

Id. at col.16 ll.38–58 (original emphasis omitted; bold-italic emphasis added to denote terms in dispute).

The parties dispute whether there is a substantial difference in claim scope between IPR-cancelled Claim 1 and reissued Claim 23. Plaintiff maintains that the ports of cancelled Claim 1 are inherently fiber-collimator ports, that the PTAB's conclusion to the contrary is wrong and in any event based on a different claim-construction standard than applies in litigation, and that there is no meaningful difference in scope between Claims 1 and 23 when properly construed under the litigation claim-construction standard (thus avoiding intervening rights for Defendants' actions before issue of the '905 Patent). Defendants maintain that the ports of IPR-cancelled Claim 1 are not limited to fiber-collimator ports, that Plaintiff is collaterally estopped from challenging the PTAB's broader construction of "port," and that there is a substantial difference in scope between Claims 1 and 23 (thus triggering intervening rights for Defendants' actions before issue of the '905 Patent). The parties present a similar dispute regarding the '906 Patent. *See* the parties briefing on Defendants' motions under Fed. R. Civ. P. 12(c): '076 Case Dkt. Nos. 57, 63, 65, and 70; and '077 Case Dkt. Nos. 74, 81, 87, and 91.

II. LEGAL PRINCIPLES

A. Claim Construction

"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) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To determine the meaning of the claims, courts start by considering the intrinsic evidence. *Id.* at 1313; *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *Phillips*, 415 F.3d at 1314; *C.R. Bard, Inc.*, 388 F.3d at 861. The general rule—subject to certain specific exceptions discussed *infra*—is that each claim term is construed according to its ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the patent. *Phillips*, 415 F.3d at 1312–13; *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003); *Azure Networks, LLC v. CSR PLC*, 771 F.3d 1336, 1347 (Fed. Cir. 2014) ("There is a heavy presumption that claim terms carry their accustomed meaning in the relevant community at the relevant time.") (vacated on other grounds).

"The claim construction inquiry . . . begins and ends in all cases with the actual words of the claim." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998). "[I]n all aspects of claim construction, 'the name of the game is the claim.'" *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1298 (Fed. Cir. 2014) (quoting *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998)). First, a term's context in the asserted claim can be instructive. *Phillips*, 415 F.3d at 1314. Other asserted or unasserted claims can also aid in determining the claim's meaning, because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim

terms can also assist in understanding a term's meaning. *Id*. For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id*. at 1314–15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id*. (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[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). But, "'[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.'" *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *see also Phillips*, 415 F.3d at 1323. "[I]t is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004).

The prosecution history is another tool to supply the proper context for claim construction because, like the specification, the prosecution history provides evidence of how the U.S. Patent and Trademark Office ("PTO") and the inventor understood the patent. *Phillips*, 415 F.3d at 1317. However, "because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes." *Id.* at 1318; *see also Athletic*

Alternatives, Inc. v. Prince Mfg., 73 F.3d 1573, 1580 (Fed. Cir. 1996) (ambiguous prosecution history may be "unhelpful as an interpretive resource").

Although extrinsic evidence can also be useful, it is "'less significant than the intrinsic record in determining the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc.*, 388 F.3d at 862). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id*. at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition are not helpful to a court. *Id*. Extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id*. The Supreme Court has explained the role of extrinsic evidence in claim construction:

> In some cases, however, the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period. *See, e.g., Seymour v. Osborne*, 11 Wall. 516, 546 (1871) (a patent may be "so interspersed with technical terms and terms of art that the testimony of scientific witnesses is indispensable to a correct understanding of its meaning"). In cases where those subsidiary facts are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence. These are the "evidentiary underpinnings" of claim construction that we discussed in *Markman*, and this subsidiary factfinding must be reviewed for clear error on appeal.

Teva Pharm. USA, Inc. v. Sandoz, Inc., 574 U.S. 318, 331–32 (2015).

B. Departing from the Ordinary Meaning of a Claim Term

There are "only two exceptions to [the] general rule" that claim terms are construed according to their plain and ordinary meaning: "1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of the claim term either in the

specification or during prosecution."[3] *Golden Bridge Tech., Inc. v. Apple Inc.*, 758 F.3d 1362, 1365 (Fed. Cir. 2014) (quoting *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012)); *see also GE Lighting Solutions, LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) ("[T]he specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal."). The standards for finding lexicography or disavowal are "exacting." *GE Lighting Solutions*, 750 F.3d at 1309.

To act as his own lexicographer, the patentee must "clearly set forth a definition of the disputed claim term," and "clearly express an intent to define the term." *Id.* (quoting *Thorner*, 669 F.3d at 1365); *see also Renishaw*, 158 F.3d at 1249. The patentee's lexicography must appear "with reasonable clarity, deliberateness, and precision." *Renishaw*, 158 F.3d at 1249.

To disavow or disclaim the full scope of a claim term, the patentee's statements in the specification or prosecution history must amount to a "clear and unmistakable" surrender. *Cordis Corp. v. Boston Sci. Corp.*, 561 F.3d 1319, 1329 (Fed. Cir. 2009); *see also Thorner*, 669 F.3d at 1366 ("The patentee may demonstrate intent to deviate from the ordinary and accustomed meaning of a claim term by including in the specification expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope."). "Where an applicant's statements are amenable to multiple reasonable interpretations, they cannot be deemed clear and unmistakable." *3M Innovative Props. Co. v. Tredegar Corp.*, 725 F.3d 1315, 1326 (Fed. Cir. 2013).

C. Functional Claiming and 35 U.S.C. § 112, ¶ 6 (pre-AIA) / § 112(f) (AIA)

A patent claim may be expressed using functional language. *See* 35 U.S.C. § 112, ¶ 6; *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347–49 & n.3 (Fed. Cir. 2015) (en banc in

[3] Some cases have characterized other principles of claim construction as "exceptions" to the general rule, such as the statutory requirement that a means-plus-function term is construed to cover the corresponding structure disclosed in the specification. *See, e.g., CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1367 (Fed. Cir. 2002).

relevant portion). Section 112, Paragraph 6, provides that a structure may be claimed as a "means . . . for performing a specified function" and that an act may be claimed as a "step for performing a specified function." *Masco Corp. v. United States*, 303 F.3d 1316, 1326 (Fed. Cir. 2002).

But § 112, ¶ 6 does not apply to all functional claim language. There is a rebuttable presumption that § 112, ¶ 6 applies when the claim language includes "means" or "step for" terms, and that it does not apply in the absence of those terms. *Masco Corp.*, 303 F.3d at 1326; *Williamson*, 792 F.3d at 1348. The presumption stands or falls according to whether one of ordinary skill in the art would understand the claim with the functional language, in the context of the entire specification, to denote sufficiently definite structure or acts for performing the function. *See Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015) (§ 112, ¶ 6 does not apply when "the claim language, read in light of the specification, recites sufficiently definite structure" (quotation marks omitted) (citing *Williamson*, 792 F.3d at 1349; *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014))); *Williamson*, 792 F.3d at 1349 (§ 112, ¶ 6 does not apply when "the words of the claim are understood by persons of ordinary skill in the art to have sufficiently definite meaning as the name for structure"); *Masco Corp.*, 303 F.3d at 1326 (§ 112, ¶ 6 does not apply when the claim includes an "act" corresponding to "how the function is performed"); *Personalized Media Communications, L.L.C. v. International Trade Commission*, 161 F.3d 696, 704 (Fed. Cir. 1998) (§ 112, ¶ 6 does not apply when the claim includes "sufficient structure, material, or acts within the claim itself to perform entirely the recited function . . . even if the claim uses the term 'means.'" (quotation marks and citation omitted)).

When it applies, § 112, ¶ 6 limits the scope of the functional term "to only the structure, materials, or acts described in the specification as corresponding to the claimed function and equivalents thereof." *Williamson*, 792 F.3d at 1347. Construing a means-plus-function limitation

involves multiple steps. "The first step . . . is a determination of the function of the means-plus-function limitation." *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed. Cir. 2001). "[T]he next step is to determine the corresponding structure disclosed in the specification and equivalents thereof." *Id.* A "structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim." *Id.* The focus of the "corresponding structure" inquiry is not merely whether a structure is capable of performing the recited function, but rather whether the corresponding structure is "clearly linked or associated with the [recited] function." *Id.* The corresponding structure "must include all structure that actually performs the recited function." *Default Proof Credit Card Sys. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed. Cir. 2005). However, § 112 does not permit "incorporation of structure from the written description beyond that necessary to perform the claimed function." *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999).

For § 112, ¶ 6 limitations implemented by a programmed general-purpose computer or microprocessor, the corresponding structure described in the patent specification must include an algorithm for performing the function. *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). The corresponding structure is not a general-purpose computer but rather the special purpose computer programmed to perform the disclosed algorithm. *Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008).

D. Definiteness Under 35 U.S.C. § 112, ¶ 2 (pre-AIA) / § 112(b) (AIA)

Patent claims must particularly point out and distinctly claim the subject matter regarded as the invention. 35 U.S.C. § 112, ¶ 2. A claim, when viewed in light of the intrinsic evidence, must "inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). If it does not, the claim fails § 112, ¶ 2

and is therefore invalid as indefinite. *Id.* at 901. Whether a claim is indefinite is determined from the perspective of one of ordinary skill in the art as of the time the application for the patent was filed. *Id.* at 911. As it is a challenge to the validity of a patent, the failure of any claim in suit to comply with § 112 must be shown by clear and convincing evidence. *BASF Corp. v. Johnson Matthey Inc.*, 875 F.3d 1360, 1365 (Fed. Cir. 2017). "[I]ndefiniteness is a question of law and in effect part of claim construction." *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 517 (Fed. Cir. 2012).

When a term of degree is used in a claim, "the court must determine whether the patent provides some standard for measuring that degree." *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1378 (Fed. Cir. 2015) (quotation marks omitted). Likewise, when a subjective term is used in a claim, "the court must determine whether the patent's specification supplies some standard for measuring the scope of the [term]." *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1351 (Fed. Cir. 2005). The standard "must provide objective boundaries for those of skill in the art." *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014).

In the context of a claim governed by 35 U.S.C. § 112, ¶ 6, the claim is invalid as indefinite if the claim fails to disclose adequate corresponding structure to perform the claimed function. *Williamson*, 792 F.3d at 1351–52. The disclosure is inadequate when one of ordinary skill in the art "would be unable to recognize the structure in the specification and associate it with the corresponding function in the claim." *Id*. at 1352.

III. CONSTRUCTION OF DISPUTED TERMS

A. "port(s)" and "fiber collimators . . . providing . . . port(s)"

Disputed Term[4]	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"port(s)" • '905 Patent Claims 1, 15, 16, 19, 23, 47, 49, 51 • '906 Patent Claims 61, 115, 133	fiber collimator port(s)	plain and ordinary meaning
"fiber collimators . . . providing . . . port(s)" • '906 Patent Claims 1, 21, 31, 37, 44, 68, 89, 100, 115	fiber collimators providing and serving as port(s)	plain and ordinary meaning

Because the parties' arguments and proposed constructions with respect to these terms are related, the Court addresses the terms together.

The Parties' Positions

Plaintiff submits: The "ports" of the claims are limited to fiber-collimator ports and do not encompass "the openings on 'circulators.'" This nature of the claimed ports is specified as a feature of the "present invention" of the '905 and '906 Patents (citing '905 Patent col.3 l.66 – col.4 l.2). And in all the described embodiments in the patents, "fiber collimators serve as the physical structure of the claimed ports." The only discussion of circulators in the patents is in the background section, which disparages circulators and structurally distinguishes circulators from the ports to which they may be coupled. Finally, Plaintiff reiterated in *Inter Partes* Reviews of patents' parents that the claimed ports are fiber-collimator ports. Dkt. No. 72 at 8–15.[5]

[4] For all term charts in this order, the Court includes the highest-level claims of each dependency chain that include the term and that is identified by the parties in their Patent Rule 4-5(d) Joint Claim Construction Chart (Dkt. No. 90).

[5] All docket citations in the Construction of Disputed Terms section are to the '077 Case.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 figs.1A, 1D, col.2 ll.44–45, col.2 ll.48–49, col.2 l.59, col.3 ll.2–5, col.3 ll.13–32, col.3 l.66 – col.4 l.2, col.4 ll.37–38, col.7 ll.4–7, col.8 ll.36–37, col.9 ll.20–21, col.9 ll.38–39, col.10 ll.32–33, col.10 ll.39–40, col.10 ll.49–52, col.11 ll.5–7; POR IPR2014-01166[6] at 2, 6–7, 31–32 (Plaintiff's Ex. 13, Dkt. No. 72-19 at 10, 14–15, 39–40); Appeal Brief[7] at 12–13 (Plaintiff's Ex. 15, Dkt. No. 72-21 at 22–23). **Extrinsic evidence**: *Merriam-Webster Dictionary Online*, "provide"[8] (Plaintiff's Ex. 5, Dkt. No. 72-11); Sergienko Dep.[9] at 67:12 – 68:21 (Plaintiff's Ex. 14, Dkt. No. 72-20 at 4–8); Sergienko Decl.[10] ¶¶ 158, 167–68 (Dkt. No. 72-1).

Defendants respond: The term "port" in the '905 and '906 Patents is used according to its ordinary meaning (a "point of entry or exit of light"), which is not limited to a fiber-collimator port and plainly encompasses circulator ports. Similarly, a fiber collimator "providing" a port is broader than a fiber collimator "providing and serving as" a port. The claims specify where a port is limited to a fiber-collimator port and otherwise allow that a port is not so limited. Indeed, in *Inter Partes* Review of the '905 and '906 Patents' parents, the PTAB expressly rejected: (1) that "port" in the claims is limited to a fiber-collimator port and (2) that a fiber collimator "providing" a port is limited to a fiber collimator serving as a port. The PTAB further held that "port" plainly encompasses circulator ports, and subsequently held claims invalid. These rulings were affirmed

[6] Patent Owner Response to the Petition, *Cisco Systems, Inc. v. Capella Photonics, Inc.*, IPR2014-01166 (Patent No. RE42,368) (P.T.A.B. May 7, 2015), paper 19.
[7] Principal Brief for Appellant, *Capella Photonics, Inc. v. Cisco Systems, Inc. et al.*, Nos. 2016-2394, 2016-2395, 2017-1105, 2017-1106, 2017-1107, 2017-1108 (Fed. Cir. Feb. 13, 2017), Dkt. No. 48.
[8] https://www.merriam-webster.com/dictionary/provide#
[9] Remote Videoconferenced Videotaped Deposition of Dr. Alexander Sergienko (Nov. 18, 2020).
[10] Declaration of Alexander Sergienko (Nov. 6, 2020).

by the Federal Circuit. In subsequent reissue proceedings, claims were modified or added to specify that some, but not all, claimed ports were fiber-collimator ports. The surrendered patents then reissued as the '905 and '906 Patents. Dkt. No. 80 at 8–19.

In addition to the claims themselves, Defendants cite the following intrinsic and extrinsic evidence to support their position: **Intrinsic evidence**: '905 Patent, at [57] Abstract, fig.1A, col.5 ll.54–61, col.7 ll.1–10, col.11 ll.25–38, col.11 l.57 – col.12 l.11, col.12 l.62 – col.13 l.3, col.13 ll.40–53; '906 Patent col.1 ll.34–36; '905 Patent File Wrapper[11] June 29, 2018 Reissue Application Declaration by the Assignee (Defendants' Ex. K, Dkt. No. 80-12 at 28), March 25, 2019 Preliminary Amendment at Appendix (Defendants' Ex. K, Dkt. No. 80-12 at 7), June 26, 2019 Office Action at 5 (Defendants' Ex. K, Dkt. No. 80-12 at 4), July 30, 2019 Response at 13 (Defendants' Ex. K, Dkt. No. 80-12 at 2); '906 Patent File Wrapper[12] June 29, 2018 Reissue Application Declaration by the Assignee (Defendants' Ex. L, Dkt. No. 80-13 at 37), March 25, 2019 Preliminary Amendment at 41 (Defendants' Ex. L, Dkt. No. 80-13 at 9), June 26, 2019 Office Action at 10 (Defendants' Ex. L, Dkt. No. 80-13 at 6), July 30, 2019 Response at 29 (Defendants'

[11] Defendants' Exhibit K (Dkt. No. 80-12) is a variety of document segments that are ostensibly from the '905 Patent file wrapper. Dkt. No. 80-1 at ¶ 12. In many instances, the Court was unable to ascertain the nature of the various documents from the exhibit because Defendants did not submit sufficient portions of the documents. The Court's characterization of the individual documents in Exhibit K comes from the Court's review of the file wrapper available on the USPTO's Public Patent Application Information Retrieval database, available at https://portal.uspto.gov/pair/PublicPair, and on the USPTO's Patent Center database, available at https://patentcenter.uspto.gov/#!/.

[12] Defendants' Exhibit L (Dkt. No. 80-13) is a variety of document segments that are ostensibly from the '906 Patent file wrapper. Dkt. No. 80-1 at ¶ 13. In many instances, the Court was unable to ascertain the nature of the various documents from the exhibit because Defendants did not submit sufficient portions of the documents. The Court's characterization of the individual documents in Exhibit L comes from the Court's review of the file wrapper available on the USPTO's Public Patent Application Information Retrieval database, available at https://portal.uspto.gov/pair/PublicPair, and on the USPTO's Patent Center database, available at https://patentcenter.uspto.gov/#!/.

Ex. L, Dkt. No. 80-13 at 3); U.S. Patent Application No. 60/277,217 at 3, fig.9 (Defendants' Ex. B, Dkt. No. 80-3 at 5, 8); Sergienko IPR Dep.[13] at 95:14–17 (Defendants' Ex. Q, Dkt. No. 80-18 at 20); Final Written Decision IPR2014-01166[14] at 12–16, 26–28 (Defendants' Ex. E, Dkt. No. 80-6 at 13–17, 27–29); Final Written Decision IPR2014-01276[15] at 12–16, 27–28 (Defendants' Ex. F, Dkt. No. 80-7 at 13–17, 28–29). **Extrinsic evidence**: Willner Decl.[16] ¶¶ 126–50 (Dkt. No. 80-41); Willner Decl. Ex. C (Dkt. No. 80-44); Willner Decl. Ex. D (Dkt. No. 80-45); Sergienko Dep. at 64:7–16, 79:20 – 80:19, 91:18 – 92:1, 92:17 – 93:11, 94:1–5, 96:3–14, 103:21 – 104:10, 114:14 – 117:1 (Defendants' Ex. R, Dkt. No. 80-19 at 5–11, 13–15, 19–22); Wilde Dep.[17] at 44:5 – 45:11 (Defendants' Ex. T, Dkt. No. 80-21 at 7–8).

Plaintiff replies: The PTAB's IPR rulings that the ports of the claims are not limited to fiber-collimator ports were based on the Broadest Reasonable Interpretation claim-construction standard rather than the litigation standard that governs here. During the Reissue proceedings, the claims were amended "merely to clarify that claims from the original [RE42,368] and [RE42,678] patents were limited to fiber collimators providing and serving as input and output 'ports.'" "The edits to the claims make this clear, but do not change the scope of the claims under *Phillips*." In fact, in seeking reissue of the RE42,368 and RE42,768 patents, Plaintiff declared to the USPTO that the claims were being amended to express limitations that are implied under the *Phillips* claim-construction standard. Dkt. No. 83 at 4–10.

[13] Videotaped Deposition of Alexander V. Sergienko, *Cisco Systems, Inc. v. Capella Photonics*, Inc., IPR2014-01166 (Patent No. RE42,368) (P.T.A.B. June 30, 2015), exhibit 1039.
[14] Final Written Decision, *Cisco Systems, Inc. et al. v. Capella Photonics, Inc.*, IPR2014-01166 (Patent No. RE42,368) (P.T.A.B. Jan. 28, 2016), paper 44.
[15] Final Written Decision, *Cisco Systems, Inc. et al. v. Capella Photonics, Inc.*, IPR2014-01276 (Patent No. RE42,678) (P.T.A.B. Feb. 17, 2016), paper 40.
[16] Declaration of Dr. Alan Willner Regarding Claim Construction (Nov. 6., 2020).
[17] Deposition of Jeffrey Wilde (Dec. 10, 2020) (Rough Draft, Uncertified Transcript).

Plaintiff cites further **intrinsic evidence** to support its position: '905 Patent figs. 2A–2B, 3–4B, col. 3 l.63 – col.6 l.37, col.7 ll.1–10, col.8 ll.58–59, col.9 ll.34–40, col.9 ll.62–65, col.10 ll.52–54, col.11 ll.28–30, col.11 ll.63–66, col.13 ll.44–47; '905 Patent File Wrapper June 29, 2018 Reissue Application Declaration by the Assignee at 2 (Defendants' Ex. K, Dkt. No. 80-12 at 29), June 29, 2018 Preliminary Amendment at 11–15 (Defendants' Ex. K, Dkt. No. 80-12 at 19–23), June 26, 2019 Office Action at 6–7 (Defendants' Ex. K, Dkt. No. 80-12 at 5–6). July 30, 2019 Response at 13–14 (Defendants' Ex. K, Dkt. No. 80-12 at 2–3); '906 Patent File Wrapper June 29, 2018 Reissue Application Declaration by the Assignee at 2 (Defendants' Ex. L, Dkt. No. 80-13 at 38), June 29, 2018 Preliminary Amendment at 19–22 (Defendants' Ex. L, Dkt. No. 80-13 at 29–32), June 26, 2019 Office Action at 10–11 (Defendants' Ex. L, Dkt. No. 80-13 at 6–7), July 30, 2019 Response at 28–29 (Defendants' Ex. L, Dkt. No. 80-13 at 3); POR IPR2014-01166 (Plaintiff's Ex. 13, Dkt. No. 72-19); POR IPR2014-01276[18] (Plaintiff's Ex. 29, Dkt. No. 72-35); POR IPR2015-00726[19] (Plaintiff's Ex. 30, Dkt. No. 72-36); POR IPR2015-00727[20] (Plaintiff's Ex. 31, Dkt. No. 72-37); POR IPR2015-00731[21] (Plaintiff's Ex. 32, Dkt. No. 72-38); POR IPR2015-00739[22] (Plaintiff's Ex. 33, Dkt. No. 72-39); POPR IPR2015-00816[23] (Plaintiff's Ex. 34,

[18] Patent Owner Response to the Petition, *Cisco Systems, Inc. v. Capella Photonics, Inc.*, IPR2014-01276 (Patent No. RE42,678) (P.T.A.B. May 7, 2015), paper 15.
[19] Patent Owner Response, *Fujitsu Network Communications, Inc. v. Capella Photonics, Inc.*, IPR2015-00726 (Patent No. RE42,368) (P.T.A.B. Dec. 23, 2015), paper 22.
[20] Patent Owner Response, *Fujitsu Network Communications, Inc. v. Capella Photonics, Inc.*, IPR2015-00727 (Patent No. RE42,678) (P.T.A.B. Dec. 23, 2015), paper 20.
[21] Patent Owner Response, *JDS Uniphase Corp. v. Capella Photonics, Inc.*, IPR2015-00731 (Patent No. RE42,368) (P.T.A.B. Dec. 1, 2015), paper 17.
[22] Patent Owner Response, *JDS Uniphase Corp. v. Capella Photonics, Inc.*, IPR2015-00739 (Patent No. RE42,678) (P.T.A.B. Dec. 1, 2015), paper 16.
[23] Patent Owner Preliminary Response, *Ciena Corp. et al. v. Capella Photonics, Inc.*, IPR2015-00816 (Patent No. RE42,368) (P.T.A.B. June 18, 2015), paper 10.

Dkt. No. 72-40); POPR IPR2015-00894[24] (Plaintiff's Ex. 35, Dkt. No. 72-41); Final Written Decision IPR2015-00726[25] (Defendants' Ex. C, Dkt. No. 80-4); Final Written Decision IPR2015-00727[26] (Defendants' Ex. D, Dkt. No. 80-5); Final Written Decision IPR2014-01166 (Defendants' Ex. E, Dkt. No. 80-6); Final Written Decision IPR2014-01276 (Defendants' Ex. F, Dkt. No. 80-7); Final Written Decision IPR2015-00731[27] (Defendants' Ex. G, Dkt. No. 80-8); Final Written Decision IPR2015-00739[28] (Defendants' Ex. H, Dkt. No. 80-9); Appeal Brief (Plaintiff's Ex. 15, Dkt. No. 72-21); Appeal Reply Brief[29] (Plaintiff's Ex. 36, Dkt. No. 72-42).

Analysis

There are two issues in dispute. First, whether "port" in the Asserted Patents is limited to "fiber collimator port." It is not. Second, whether a fiber collimator "providing" a port means that the port is necessarily a fiber collimator port. It does not.

The Court is not convinced that the "ports" of the invention described in the Asserted Patents are necessarily fiber collimator ports. To begin, the evidence of record establishes that "port" has a customary meaning that is not limited to fiber collimator ports. For example, Plaintiff's expert testified as follows:

> Q. If we are talking about optical switching, what is the ordinary and customary meaning of the word "port" to a person of ordinary skill?

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[24] Patent Owner Preliminary Response, *Ciena Corp. et al. v. Capella Photonics, Inc.*, IPR2015-00894 (Patent No. RE42,678) (P.T.A.B. July 7, 2015), paper 10.
[25] Final Written Decision, *Fujitsu Network Communications, Inc. v. Capella Photonics, Inc.*, IPR2015-00726 (Patent No. RE42,368) (P.T.A.B. Sept. 28, 2016), paper 38.
[26] Final Written Decision, *Fujitsu Network Communications, Inc. v. Capella Photonics, Inc.*, IPR2015-00727 (Patent No. RE42,678) (P.T.A.B. Sept. 28, 2016), paper 16.
[27] Final Written Decision, *Lumentum Holdings Inc. et al. v. Capella Photonics, Inc.*, IPR2015-00731 (Patent No. RE42,368) (P.T.A.B. Sept. 29, 2016), paper 51.
[28] Final Written Decision, *Lumentum Holdings Inc. et al. v. Capella Photonics, Inc.*, IPR2015-00739 (Patent No. RE42,678) (P.T.A.B. Oct. 14, 2016), paper 50.
[29] Reply Brief for Appellant, *Capella Photonics, Inc. v. Cisco Systems, Inc. et al.*, Nos. 2016-2394, 2016-2395, 2017-1105, 2017-1106, 2017-1107, 2017-1108 (Fed. Cir. June 23, 2017), Dkt. No. 61.

> A. The port is the entry or points of entry or exit from this particular device that you are talking about. If it's a switch, it's entry of the switch or exit out of the switch. That's what port provides.

Sergienko Dep. at 64:7–16, Dkt. No. 80-19 at 5; *see also*, *id*. at 91:18 –92:1 ("Q. But the output port does not have to be a fiber collimator; correct? A. . . . It will be a poor quality port. Q. . . . but it would still be a port; correct? . . . A. For the output only."), Dkt. No. 80-19 at 8–9; Willner Decl. ¶¶ 147–49 (citing various dictionary definitions), Dkt. No. 80-41. The fact that "port" as customarily used in the art was not limited to "fiber collimator port" was recognized by the PTAB during the IPR proceedings. *See, e.g.*, Final Written Decision IPR2014-01166 at 12 ("There is no dispute that the ordinary and customary meaning of 'port' encompasses circulator ports, and, indeed, any 'point of entry or exit of light.' *See* Dr. Sergienko Deposition Transcript (Ex. 1039), 43:16-23 45:12-13 ('The circulator ports are ports with constraints.')."), Dkt. No. 80-6 at 13.

The intrinsic record does not rise to the exacting standard required to limit "port" to "fiber collimator port." Plaintiff heavily relies on the following passage from the Asserted Patents:

> The present invention provides a wavelength-separating-routing (WSR) apparatus and method which employ an array of fiber collimators serving as an input port and a plurality of output ports; a wavelength-separator; a beam-focuser; and an array of channel micromirrors.

'905 Patent col.3 l.66 – col.4 l.3. At first glance, this appears to suggest that the ports of the invention are inherently fiber collimator ports. Other portions of the patents suggest otherwise, however. For example, the patents explain that "the WSR apparatus 100 comprises multiple input/ output ports which ***<u>may be</u> in the form of an array of fiber collimators*** 110, providing an input port 110-1 and a plurality of output ports." *Id*. at col.7 ll.4–7 (emphasis added). Thus, one passage states that the "present invention provides . . . an array of fiber collimators serving as an input port and a plurality of output ports" while the other clarifies that providing the input and output ports as an "array of fiber collimators" is optional. This suggests the "present invention" language should

not be read to state an inherent property of the invention. Further, cancelled Claims 1, 7, and 8 of the '905 Patent provided:

> 1. An optical add-drop apparatus comprising
> an ***input port for an input multi-wavelength optical signal*** having first spectral channels;
> one or more other ports for second spectral channels;
> an ***output port for an output multi-wavelength optical signal***;
> a wavelength-selective device for spatially separating said spectral channels;
> a spatial array of beam-deflecting elements positioned such that each element receives a corresponding one of said spectral channels, each of said elements being individually and continuously controllable in two dimensions to reflect its corresponding spectral channel to a selected one of said ports and to control the power of the spectral channel reflected to said selected port.
>
> 7. The optical add-drop apparatus of claim 1 further comprising ***alignment mirrors for adjusting alignment of said input and output multi-wavelength optical signals*** and said second spectral channels with said wavelength-selective device.
>
> 8. The optical add-drop apparatus of claim 7 ***further comprising collimators associated with said alignment mirrors***, and ***imaging lenses*** in a telecentric arrangement with said alignment mirrors and said collimators.

Id. at col.14 ll.29–43, col.14 l.66 – col.15 l.3 (emphasis added). This largely tracks the following described embodiment:

> The WSR apparatus of the present invention may further comprise an array of collimator-alignment mirrors, in optical communication with the wavelength-separator and the fiber collimators, for adjusting the alignment of the input multi-wavelength signal and directing the spectral channels into the selected output ports by way of angular control of the collimated beams. Each collimator-alignment mirror may be rotatable about one or two axes. The collimator-alignment mirrors may be arranged in a one-dimensional or two-dimensional array. First and second arrays of ***imaging lenses*** ***may additionally be optically interposed between the collimator-alignment mirrors*** ***and the fiber collimators*** ***in a telecentric arrangement***, thereby "imaging" the collimator-alignment mirrors onto the corresponding fiber collimators to ensure an optimal alignment.

Id. at col.4 ll.42–56. This description is in the context of the earlier passage providing that "the present invention provides . . . an array of fiber collimators serving as an input port and a plurality of output ports." *Id*. at col.4 ll.4 ll.1–2. Claim 8, read in light of the described embodiments, further

suggests that the ports are not limited to collimators, else there would be no need to specify the apparatus "further comprising" collimators in Claim 8.

The Reissue proceedings also suggest that the claimed ports are not necessarily fiber collimator ports. Notably, Plaintiff modified some—but not all—claim-recited ports to specify that they are fiber collimator ports. For example, Claim 23 of the '905 Patent provides:

> 23. An optical add-drop apparatus comprising an output port and fiber collimators serving as an input port and one or more other ports, the apparatus comprising:
> the ***fiber collimator input port*** for an input multi-wavelength optical signal having first spectral channels;
> the ***fiber collimator one or more other ports*** for second spectral channels;
> the ***output port*** for an output multi-wavelength optical signal;
> a wavelength-selective device for spatially separating said spectral channels;
> a spatial array of beam-deflecting elements positioned such that each element receives a corresponding one of said spectral channels, each of said elements being individually and continuously controllable in two dimensions to reflect its corresponding spectral channel to a selected one of said output port or the fiber collimator ports and to control the power of the spectral channel reflected to said output port or the fiber collimator selected port.

Id. at col.16 ll.38–58 (original emphasis omitted; emphasis added). The addition of "fiber collimator" to the claims ostensibly was to express an implied limitation. '905 Patent File Wrapper June 29, 2018 Reissue Application Declaration by the Assignee at 2 (Dkt. No. 80-12 at 29). But if the Patents' provision that "[t]he present invention provides a wavelength-separating-routing (WSR) apparatus and method which employ an array of fiber collimators serving as an input port and a plurality of output ports" states that the input and output ports of the invention are necessarily fiber collimator ports, then the "output port" of Claim 23 should also have been recited as a fiber collimator port. The fact that it was not further suggests that the ports of the invention are not necessarily fiber collimator ports.[30]

[30] At the hearing, Plaintiff advanced the position that the Asserted Patents defined "ports" as fiber collimator ports for only the wavelength-separating-routing apparatus (WSR) aspect of the invention. According to Plaintiff, other "ports" in the claims, such as the "output port" in '905

The Court is also not convinced that a fiber collimator "providing" a port necessitates that the provided port is a fiber collimator port (i.e., that the fiber collimator serves as the port). Plaintiff has not identified any intrinsic evidence that establishes "providing" should be narrowly interpreted as "serving as." Indeed, the Asserted Patents use "providing" according to its broad plain meaning. *See, e.g.,* '905 Patent at col.11 ll.15–22 ("a WSR apparatus of the present invention may incorporate a servo-control assembly, for ***providing*** dynamic control of the coupling of the spectral channels into the respective output ports" (emphasis added)).

Ultimately, the "port" of the Patents' invention is not clearly limited to a fiber collimator port, even when provided by a fiber collimator, such that "fiber collimator . . . port" should be read into claims where it is not specified.

Accordingly, the Court rejects Plaintiff's position and determines that these terms have their plain and ordinary meanings without the need for further construction.

Patent Claim 23, are not necessarily fiber collimator ports. As explained by the Court, the Asserted Patents describe that forming the WSR input and output ports with an "array of fiber collimators" is expressly optional and the collimators "further" provided by dependent Claim 8 naturally align with the WSR collimator ports of the exemplary embodiments. Thus, Plaintiff's hearing position that the patents allow that ports that are not WSR ports may not be fiber collimator ports does not change the Court's analysis and conclusion.

B. "beam-deflecting element(s)"

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"beam-deflecting element(s)" • '905 Patent Claim 23	Plain and ordinary meaning. Capella specifically disagrees that construction under 35 U.S.C. §112(f)/¶6 is appropriate. Alternatively, • deflective parts, including but not limited to mirrored or reflective parts, of a beam deflector	35 U.S.C. § 112, ¶ 6 applies as follows: Function: • (1) "each element receives a corresponding one of said spectral channels"; (2) "each of said elements being individually and continuously controllable in two dimensions"; (3) each of said elements "reflect its corresponding spectral channel to a selected one of said output port or the fiber collimator ports"; and (4) each of said elements "control the power of the spectral channel reflected to said output port or the fiber collimator selected port." Structure: • Movable silicon micromachined mirrors, movable reflective ribbons, or movable reflective membranes. Alternatively, • indefinite Alternatively, if § 112, ¶ 6 does not apply: • movable reflective element(s) of a beam deflector

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"beam-deflecting element(s)" • '905 Patent Claim 47		35 U.S.C. § 112, ¶ 6 applies as follows: Function: • (1) "each element receives a corresponding one of said spectral channels"; (2) "each of said elements being individually and continuously controllable in two dimensions"; (3) each of said elements "reflect its corresponding spectral channel to a selected one of said output port or the fiber collimators serving as said ports"; and (4) each of said elements "control the power of the spectral channel reflected to said output port of the fiber collimator serving as said selected port." See '905 Patent at 18:31-42. Structure: • Movable silicon micromachined mirrors, movable reflective ribbons, or movable reflective membranes. Alternatively, • indefinite Alternatively, if § 112, ¶ 6 does not apply: • movable reflective element(s) of a beam deflector

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"beam-deflecting element(s)" • '905 Patent Claim 49		35 U.S.C. § 112, ¶ 6 applies as follows: Function: • (1) "each element receives a corresponding one of said spectral channels"; (2) "each of said elements being individually and continuously controllable in two dimensions"; (3) each of said elements "reflect its corresponding spectral channel to a selected one of said output port or the fiber collimator ports"; and (4) each of said elements "control the power of the spectral channel reflected to said output port or said fiber collimator serving as said selected port. Structure: • Movable silicon micromachined mirrors, movable reflective ribbons, or movable reflective membranes. Alternatively, • indefinite Alternatively, if § 112, ¶ 6 does not apply: • movable reflective element(s) of a beam deflector

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"beam-deflecting element(s)" • '905 Patent Claim 51		35 U.S.C. § 112, ¶ 6 applies as follows: Function: • (1) "imaging each of sad spectral channels onto a corresponding beam-deflecting element"; (2) "controlling dynamically and continuously said beam-deflecting elements in two dimensions so as to combine selected ones of said spectral channels into an output multi-wavelength optical signal"; (3) "to control the power of the spectral channels combined into said output multiwavelength optical signal"; and (4) controlling the beam-defecting elements "comprises reflecting said non-selected ones of said spectral channels to one or more fiber collimator serving as drop ports." Structure: • Movable silicon micromachined mirrors, movable reflective ribbons, or movable reflective membranes. Alternatively, • indefinite Alternatively, if § 112, ¶ 6 does not apply: • movable reflective element(s) of a beam deflector

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"beam-deflecting element(s)" • '906 Patent Claim 133		35 U.S.C. § 112, ¶ 6 applies as follows: Function: • (1) "each beam-deflecting element receives one of said spectral channels"; (2) "dynamically and continuously controlling said beam-deflecting elements in two dimensions"; (3) controlling the beam-deflecting elements "to direct said spectral channels into any selected ones of output ports"; and (4) controlling the beam-deflecting elements "to control the power of the spectral channels coupled into said selected output ports to receive one of said spectral channels." Structure: • Movable silicon micromachined mirrors, movable reflective ribbons, or movable reflective membranes. Alternatively, • indefinite Alternatively, if § 112, ¶ 6 does not apply: • movable reflective element(s) of a beam deflector

The Parties' Positions

Plaintiff submits: The meaning of "beam deflecting elements" is plain without construction. It refers to "mirrored or reflective parts of a beam deflector array." These elements are not necessarily "movable." And, as known in the art, the elements refer to a broad class of structures and are not governed by 35 U.S.C. § 112, ¶ 6. Dkt. No. 72 at 15–17.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 Patent figs.1A, 1B, col.9 ll.22–25. **Extrinsic evidence**: Sergienko Decl. ¶¶ 91, 95 (Dkt. No. 72-1).

Defendants respond: The term "beam-deflecting element" is nothing more than a black-box recitation of structure, ostensibly covering any structure that deflects a beam of light and is thus subject to § 112, ¶ 6. Each claim at issue specifies the function of the claimed beam-deflecting elements and the only disclosed structure for performing these functions are "(1) movable silicon micromachined mirrors, (2) movable reflective ribbons, [and] (3) movable reflective membranes." Even if § 112, ¶ 6 does not apply, the beam-deflecting elements are necessarily movable. As recited in the claims, the elements are controllable to reflect spectral channels to selected ports. Indeed, the '905 and '906 Patents express the importance of the motion capabilities of the mirrors (citing '905 Patent col.9 l.26). Dkt. No. 80 at 23–26.

In addition to the claims themselves, Defendants cite the following intrinsic and extrinsic evidence to support their position: **Intrinsic evidence**: '905 Patent col.4 ll.34–36, col.9 ll.22–26; U.S. Patent Application No. 60/277,217 at 4, fig.12 (Defendants' Ex. B, Dkt. No. 80-3 at 6, 9). **Extrinsic evidence**: Sergienko Dep. at 48:6 – 49:2, 121:5 – 123:9, 123:22 – 124:3, 132:10 – 133:9 (Defendants' Ex. R, Dkt. No. 80-19 at 3–4, 23–26, 34–35); Willner Decl. ¶¶ 52–54, 56–61, 73 (Dkt. No. 80-41); U.S. Patent 8,867,917 col.1 ll.30–48 (Defendants' Ex. W, Dkt. No. 80-24).

Plaintiff replies: The beam-deflecting elements are not limited to movable mirrored or reflective elements. As is known in the art, the "reflective ribbons" described in the patents include "*multiple surfaces* that parallelly displace relative to each other to create a diffraction grating" and are "not . . . moved to direct a light beam" (Plaintiff's emphasis). Dkt. No. 83 at 10–11.

Plaintiff cites further **extrinsic evidence** to support its position: Sergienko Decl. ¶ 91–95 (Dkt. No. 72-1); Sergienko Dep. at 120:3 – 121:25, 127:24 – 132:8, 132:16 – 136:18, 201:17 – 202:16 (Plaintiff's Ex. 38, Dkt. No. 83-2 at 2–10) (Defendants' Ex. R, Dkt. No. 80-19 at 29–34); Silicon

Lighting Machines, *Grating Light Valve Technology Brief* at 1–3 (June 2001) (Plaintiff's Ex. 39, Dkt. No. 83-3 at 2–4).

Analysis

There are three issues in dispute. First, whether these terms should be governed by 35 U.S.C. § 112, ¶ 6. Second, if the terms are governed by § 112, ¶ 6, whether the Asserted Patents limit the term as Defendants suggest. Third, if the terms are not governed by § 112, ¶ 6, whether the beam-deflecting elements are necessarily movable. The Court determines that these terms are not governed by § 112, ¶ 6 and therefore does not address the second issue. The Court further determines that beam-deflecting elements are not inherently movable.

Defendants have not overcome the presumption against applying § 112, ¶ 6. The Court begins with the presumption that § 112, ¶ 6 does not apply because the terms do not include the "means" language traditionally used to signal application of the statute. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347–49 & n.3 (Fed. Cir. 2015) (en banc in relevant portion). This "presumption can be overcome and § 112, para. 6 will apply if the challenger demonstrates that the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function." *Id.* at 1349 (quotation marks omitted). "[T]he mere fact that the disputed limitations incorporate functional language does not automatically convert the words into means for performing such functions." *Zeroclick, LLC v. Apple Inc.*, 891 F.3d 1003, 1008 (Fed. Cir. 2018). "The question whether [a term] invokes section 112, paragraph 6, depends on whether persons skilled in the art would understand the claim language to refer to structure, assessed in light of the presumption that flows from the drafter's choice not to employ the word 'means.'" *Samsung Elecs. Am., Inc. v. Prisua Eng'g Corp.*, 948 F.3d 1342, 1354 (Fed. Cir. 2020).

Based on the evidence of record, "beam-deflecting elements" refers to a class of known structures and therefore does not invoke § 112, ¶ 6. For example, the Asserted Patents provide that "[t]he channel micromirrors may be provided by silicon micromachined mirrors, reflective ribbons (or membranes), or other types of beam-deflecting elements known in the art." '905 Patent col.9 ll.22–25. This indicates that "beam-deflecting element" refers to a class of structures known in the art and that, therefore, it is not governed by § 112, ¶ 6. *See Personalized Media Communs., L.L.C. v. ITC*, 161 F.3d 696, 705 (Fed. Cir. 1998) ("Even though the term 'detector' does not specifically evoke a particular structure, it does convey to one knowledgeable in the art a variety of structures known as 'detectors.' We therefore conclude that the term 'detector' is a sufficiently definite structural term to preclude the application of § 112, P 6")

The Court is not convinced that a beam-deflecting element is necessarily movable. Specifically, the Court rejects that a beam-deflecting element is a species of channel micromirror, as Defendants contend. Rather, the patents explain that "channel micromirrors may be provided by . . . types of beam-deflecting elements." '905 Patent col.9 ll.22–25. As Defendants (correctly) argued with respect to a fiber collimator "providing" a port, the term "providing" does not narrowly mean "is" or "serves as." In other words, that beam-deflecting elements may provide channel micromirrors does not mean a beam-deflecting element is a subset of channel micromirrors any more than a port is a subset of fiber collimators. Thus, even if the channel micromirrors are necessarily movable, this is not sufficient reason to read such a limitation into "beam-deflecting element." And Defendants have not identified other evidence sufficient to establish that beam-deflecting elements such as mirrors or membranes are necessarily movable.

Further, the Court is not convinced that a beam-deflecting element is necessarily reflective. There is a clear distinction between reflection and deflection in the art, where reflection is a special

case of deflection. Defendants have not identified sufficient evidence to limit beam-deflecting elements to beam-reflecting elements.

Accordingly, the Court rejects Defendants' proposed constructions and determines that these terms have their plain and ordinary meanings without the need for further construction.

C. ". . . controllable" and "controlling . . ."

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"said elements being . . . controllable" • '905 Patent Claim 23, 47, 49	Plain and ordinary meaning. Alternatively, "controllable" means: • capable of being controlled	said elements being movable
"controlling . . . said beam-deflecting elements" • '905 Patent Claim 51		moving said beam-deflecting elements
"controlling said other beam-deflecting elements" • '905 Patent Claim 52		moving said other beam-deflecting elements
"said channel micromirrors being . . . controllable" • '906 Patent Claims 68, 89, 100, 115		said channel micromirrors being movable
"controlling said beam-deflecting elements" • '906 Patent Claim 133		moving said beam-deflecting elements

Because the parties' arguments and proposed constructions with respect to these terms are related, the Court addresses the terms together.

The Parties' Positions

Plaintiff submits: "[C]ontrollable does not mean movable." Rather, the Asserted Patents specify when motion is required. Dkt. No. 72 at 17–18.

In addition to the claims themselves, Plaintiff cites the following **intrinsic evidence** to support its position: '905 Patent col.7 ll.20–21.

Defendants respond: The claims specify that the control of the beam-deflecting elements necessarily entails movement of the elements. For instance, the claims require controlling the elements "dynamically," "to reflect," or "to direct," each of which indicates movement of the elements. Control of the elements is consistently and solely described in the patents as involving movement of the elements. In fact, Plaintiff represented to the USPTO that movement of the elements was inherent to control of the elements. Dkt. No. 80 at 26–28.

In addition to the claims themselves, Defendants cite the following intrinsic and extrinsic evidence to support their position: **Intrinsic evidence**: '905 Patent col.4 ll.19–23, col.4 ll.33–37, col.6 l.66 – col.7 l.1, col.7 ll.20–25, col.8 ll.22–41, col.8 ll.38–48, col.9 ll.22–31, col.9 ll.57–61, col.10 ll.48–67; POR IPR2014-01276[31] at 13, 45–46, 51 (Defendants' Ex. X, Dkt. No. 80-25 at 7, 9–10, 13); POR IPR2014-01166[32] at 7, 13–14, 49–50, 58 (Defendants' Ex. Y, Dkt. No. 80-26 at 4, 7–8, 11–12, 16). **Extrinsic evidence**: Willner Decl. ¶¶ 75–76, 80–90 (Dkt. No. 80-41); Sergienko IPR Dep.[33] at 84:24 – 86:1 (Defendants' Ex. Q, Dkt. No. 80-18 at 12–14).

Plaintiff replies: The Asserted Patents describe embodiments that are expressly "controllable and movable," indicating that "movable" is not inherent to "controllable." The distinction made in IPR was not that controlling elements required moving the elements but rather that the prior art element (mirror) was continuously controlled. "Explaining how a particular reference (that used

[31] Patent Owner Response to the Petition, *Cisco Systems, Inc. v. Capella Photonics, Inc.*, IPR2014-001276 (Patent No. RE42,678) (P.T.A.B. May 18, 2015), paper 15.
[32] Patent Owner Response to the Petition, *Cisco Systems, Inc. v. Capella Photonics, Inc.*, IPR2014-001166 (Patent No. RE42,368) (P.T.A.B. May 7, 2015), paper 19.
[33] Videotaped Deposition of Alexander V. Sergienko, *Cisco Systems, Inc. v. Capella Photonics*, Inc., IPR2014-01166 (Patent No. RE42,368) (P.T.A.B. June 30, 2015), exhibit 1039.

movable mirrors) did not provide 'continuous' control is not an admission that continuous control (let alone the term controllable by itself) requires movement." Dkt. No. 83 at 12.

Plaintiff cites further **intrinsic evidence** to support its position: '905 Patent col.4 ll.11–14; POR IPR2014-01166 at 46–50 (Plaintiff's Ex. 13, Dkt. No. 72-19 at 54–58); POR IPR2014-01276 at 44–53 (Plaintiff's Ex. 29, Dkt. No. 72-35 at 53–62); Sergienko IPR Dep. at 83–84 (Defendants' Ex. Q, Dkt. No. 80-18 at 8–12).

Analysis

The issue in dispute is whether "controllable" and "controlling" in the claims is limited to "movable" and "moving," respectively. They are not.

Defendants have not identified anything that rises to the exacting standard for lexicography or disclaimer such that "controllable" and "controlling" should be recast as "movable" and "moving." And as stated above, Defendants have not established that all beam-deflecting elements are necessarily movable. Notably, the extrinsic evidence indicates that one disclosed variant of a beam-deflecting element (ribbons), can deflect through diffraction. Sergienko Dep. at 121:16–21 ("there are several physical ways of changing the direction of light, such as reflection, refraction, interference, and diffraction"), Dkt. No. 83-2 at 3; *id*. at 133:1–3 ("deflection by ribbons is based on [a] different physical effect than mirrors. It is diffraction rather than reflection"), Dkt. No. 83-2 at 5. Further evidence suggests that it was understood in the art that one can control deflection through diffraction other than by moving diffraction elements. *Id*. at 133:21–25, Dkt. No. 83-2 at 5. Indeed, the Asserted Patents describe spatial positioning of spectral channels using diffraction gratings. '905 Patent col.7 ll.11–20. And the patents suggest that controllable and movable are separate concepts. *See e.g.*, '905 Patent col.7 ll.21–22 ("The channel micromirrors 103 are individually ***controllable and movable*** . . .." (emphasis added)). In this light, the intrinsic evidence

identified by Defendants is not sufficient to limit control to motion. Defendants arguments are more properly addressed to written description or enablement issues than to claim-construction issues.

Accordingly, the Court rejects Defendants' proposed construction and determines that these terms have their plain and ordinary meanings without the need for further construction.

D. ". . . continuously controllable," "controlling . . . continuously . . .," and "continuously controlling . . ."

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"said elements being . . . continuously controllable" • '905 Patent Claim 23, 47, 49	Plain and ordinary meaning. Alternatively, "continuously controllable" means • capable of constant or uninterrupted control	said elements being movable by analog and not step-wise control
"controlling . . . continuously said beam-deflecting elements" • '905 Patent Claim 51		moving by analog and not step-wise control said beam-deflecting elements
"continuously controlling said beam-deflecting elements" • '906 Patent Claim 133		moving by analog and not step-wise control said beam-deflecting elements
"said channel micromirrors being . . . continuously controllable" • '906 Patent Claim 68, 100, 115		said channel micromirrors being movable by analog and not step-wise control

Because the parties' arguments and proposed constructions with respect to these terms are related, the Court addresses the terms together.

The Parties' Positions

Plaintiff submits: The word "continuously" in these terms is used according to its plain meaning, to "indicate uninterrupted control of the" beam-deflecting elements. "This was a major improvement over two-state on/off 'digital' systems." This does not exclude "stepwise" control Dkt. No. 72 at 18–20.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 Patent fig.1A, col.4 ll.19–26, col.8 ll.38–45. **Extrinsic evidence**: Sergienko Decl. ¶¶ 100–103 (Dkt. No. 72-1); Sergienko Dep. at 169:20 – 170:10 (Plaintiff's Ex. 14, Dkt. No. 72-20 at 6–7); B&C Consulting Services, *Components for R-OADMs – 2005* at 18–19[34] (March 2005) (Sergienko Decl. Ex. B, Dkt. No. 72-3); *Merriam-Webster Dictionary Online*, "continuous"[35] (Plaintiff's Ex. 6, Dkt. No. 72-12); Google English dictionary result from Google search for "continuous"[36] (Plaintiff's Ex. 7, Dkt. No. 72-13).

Defendants respond: The Asserted Patents state that the continuous nature of the control of the beam-deflecting elements refers to analog control, and that this is a feature of the "present invention" that distinguishes it over the prior art (citing '905 Patent col.4 ll.19–26). In fact, analog control and continuous control are interchangeably used in the patents. This plainly excludes stepwise control, which point Plaintiff made to distinguish prior art during IPR proceedings. Dkt. No. 80 at 28–29.

[34] Plaintiff cites pages 118–19, but the submitted document includes only pages 1 through 24. Pages 18 and 19 discuss the "Digital Approach" and the "Analog Approach" to MEMS switching of light waves. Dkt. No. 72-3 at 19–20.
[35] https://www.merriam-webster.com/dictionary/continuous
[36] https://www.google.com/search?q=continuous&rlz=1C1GCEB_enUS890US890&oq=continuous&aqs=chrome.0.69i59l2j0l4j69i60l2.2943j0j4&sourceid%E2%80%A6

In addition to the claims themselves, Defendants cite the following intrinsic and extrinsic evidence to support their position: **Intrinsic evidence**: '905 Patent col.4 ll.19–26, col.7 ll.20–25, col.8 ll.22–41, col.9 ll.22–31; POR IPR2014-01276 at 7 (Defendants' Ex. X, Dkt. No. 80-25 at 4); POR IPR2014-01166 at 7, 57–58 (Defendants' Ex. Y, Dkt. No. 80-26 at 4, 15–16). **Extrinsic evidence**: Willner Decl. ¶¶ 98–105, 108 (Dkt. No. 80-41); Sergienko IPR Dep. at 92:20 – 93:19 (Defendants' Ex. Q, Dkt. No. 80-18 at 17–19).

Plaintiff replies: The continuous control of the beam-deflecting elements indicates "uninterrupted control" of the elements, which enables "on-the-fly switching to any of a *multiplicity* of output" ports (Plaintiff's emphasis). This is distinct over the prior-art two-state systems but does not exclude stepwise control of the elements and is not limited to analog control of the elements. Plaintiff's argument in IPR was not that continuous control required analog control, or excluded stepwise control, but rather "was addressing the Petitioner's construction." Dkt. No. 83 at 12–13.

Plaintiff cites further intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 Patent col.2 l.38, col.3 ll.12–28, col.3 l.35, col.7 l.22, col.9 ll.28–31; POR IPR2014-01166 at 44–45, n.5 (Plaintiff's Ex. 13, Dkt. No. 72-19 at 54–55); POR IPR2014-01276 at 46, n.8 (Plaintiff's Ex. 29, Dkt. No. 72-35 at 53). **Extrinsic evidence**: Sergienko Decl. ¶¶ 100–104 (Dkt. No. 72-1).

Analysis

The issue in dispute is whether continuous control entails analog, rather than stepwise, control. The Asserted Patents teach that continuous control entails analog control of the element position but explains this analog nature as a continuous adjustability of the element rather than as a specific type of control signal.

The Asserted Patents equate continuous (or analog) control with control for continuous adjustment of the element. For instance, the patents provide:

> A distinct feature of the channel micromirrors in the present invention, in contrast to those used in the prior art, is that the motion, e.g., pivoting (or rotation), of each channel micromirror is ***under analog control such that its pivoting angle can be continuously adjusted***. This enables each channel micromirror to scan its corresponding spectral channel across all possible output ports and thereby direct the spectral channel to any desired output port.

'905 Patent col.4 ll.19–26 (emphasis added). The patents further provide:

> The channel micromirrors 103 are individually controllable and movable, e.g., pivotable (or rotatable) under ***analog (or continuous) control***, such that, upon reflection, the spectral channels are directed into selected ones of the output ports 110-2 through 110-N by way of the focusing lens 102 and the diffraction grating 101.

Id. at col.7 ll.20–25 (emphasis added). *See also, id*. at col.9 ll.26–31 ("What is important is that the pivoting (or rotational) motion of each channel micromirror be individually controllable in an analog manner, whereby the pivoting angle can be continuously adjusted so as to enable the channel micromirror to scan a spectral channel across all possible output ports."). Plaintiff distinguished analog control from "step-wise digital control" in IPR proceedings. Specifically, Plaintiff made the following argument to the PTAB:

> Petitioner first says Smith teaches continuous control because Smith teaches analog control. But Smith, along with several other patent applications and patents in the Smith family, indicates that ***the Smith mirror operates under step-wise digital control (i.e., not analog control)***.

POR IPR2014-01166 at 7 (emphasis added), Dkt. No. 72-19 at 15. Plaintiff further argued:

> Smith discloses tilting mirrors at both large and small angles. (*See* Smith, 18:12-14 ("Tilting about the major axis can be performed both at the large angles corresponding to the positions of the mirrors and at finer angular resolution within the large angles.").) Also, Smith says that the control is preferably performed by pulse width modulation ("PWM"). (*See id*. at 11:22-23.) A POSA would view tilting according to large angles and small angles and PWM ***more akin to step-wise digital control than analog control.*** (Sergienko Dec., ¶ 176.)

Id. at 44–45 (emphasis added), Dkt. No. 72-19 at 52–53. Plaintiff further clarified that whether control is continuous is not simply a function of input signal, but rather is a function of how the controlled elements are adjusted.

> Continuous control cannot be shown by the input signal (*i.e.*, analog vs. digital) alone. (Sergienko Dec., ¶ 181.) To determine whether Lin's mirrors—or any mirrors—are continuously controllable, Petitioner would have to look at the structure of the mirror and how the voltage affects movement of the mirror. (*See* Marom Depo. Tr., 154:13-155:8; Sergienko Dec., ¶¶ 181-82.) Petitioner fails to do so. (*See* Petition, pp. 29-31. *See also* Marom Depo. Tr. 169:21-170:10, 171:17-172:6 (saying step-wise control could produce the curve in Lin Figure 3B.)

Id. at 49, Dkt. No. 72-19 at 57. Ultimately, the meaning of "step-wise digital control" is not clear. On the record before the Court, not "step-wise digital control" may be consistent with Plaintiff's "uninterrupted control." And the patents do not use "step-wise" to describe any control. In the IPR proceedings the PTAB construed "continuously controllable" in light of the above-quoted passages from the Asserted Patents and in light of Plaintiff's arguments and determined as follows:

> Based on all of the evidence presented, we are not persuaded that "continuously controllable" is limited to "analog control," or that "analog control" necessarily corresponds to "continuous" control under all circumstances. Indeed, counsel for Petitioner suggested that although the art at issue disclosed analog control that provided continuous control, counsel further recognized that it may operate differently outside of that art. *See* Paper 43, 30:24–31-6. We determine that "continuously controllable," in light of the specification of the '368 patent, ***encompasses*** "under analog control such that it can be continuously adjusted."

Final Written Decision IPR2014-01166 at 10–12 (emphasis added), Dkt. No. 80-6 at 11–13. The Court agrees with the PTAB's understanding of this term. Thus, continuous control is not defined by whether an analog or digital signal is used to control the element, but rather whether the element is controllable such that it can be continuously adjusted.

Accordingly, the Court construes these terms as follows:

- "said elements being . . . continuously controllable" means "said elements being . . . controllable such that they can be continuously adjusted";
- "controlling . . . continuously said beam-deflecting elements" means "controlling . . . said beam-deflecting elements such that they can be continuously adjusted";
- "continuously controlling said beam-deflecting elements" means "controlling said beam-deflecting elements such that they can be continuously adjusted"; and
- "said channel micromirrors being . . . continuously controllable" means "said channel micromirrors being . . . controllable such that they can be continuously adjusted."

E. "said [beam-deflecting] elements being . . . controllable in two dimensions" and "controlling . . . said beam-deflecting elements in two dimensions"

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"said [beam-deflecting] elements being . . . controllable in two dimensions" • '905 Patent Claim 23, 47, 49	Plain and ordinary meaning. Alternatively, "dimension" means: • a direction or quality	said [beam-deflecting] elements (as construed) are rotatable about two axes
"controlling . . . said beam-deflecting elements in two dimensions" • '905 Patent Claim 51 • '906 Patent Claim 133		rotating said beam-deflecting elements (as construed) about two axes

Because the parties' arguments and proposed constructions with respect to these terms are related, the Court addresses the terms together.

The Parties' Positions

Plaintiff submits: "[T]he term 'dimension' is used in the ordinary sense to refer to a direction or quality." Thus, control in two dimensions is not limited to require movement about two axes

and encompasses any two dimensions, "e.g., X, Y, Z, time, etc." Some claims expressly require that mirrors are "pivotal about two axes." Others do not. And the Asserted Patents describe "ribbons" as exemplary beam-deflecting elements and ribbons "do not rotate about two axes." Dkt. No. 72 at 20–21.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 Patent col.9 ll.22–25. **Extrinsic evidence**: Sergienko Decl. ¶¶ 106–08 (Dkt. No. 72-1); *Merriam-Webster Dictionary Online*, "dimension"[37] (Plaintiff's Ex. 8, Dkt. No. 72-14).

Defendants respond: In the Asserted Patents, "controllable in two dimensions" is used interchangeably with "pivotal about two axes" to "explain how the elements or mirrors may be physically adjusted." There is no description of control of elements in two dimensions other than rotation of the elements about two axes. Further, the patent owner represented to the USPTO in reissue declarations that controlling in two dimensions means the same as pivoting about two axes and argued in IPR that a mirror rotatable along one axis is controllable in only one dimension. Dkt. No. 80 at 31–32.

In addition to the claims themselves, Defendants cite the following **intrinsic evidence** to support their position: '905 Patent col.9 ll.22–26; U.S. Patent No. RE42,368 File Wrapper[38] June 15, 2010 Preliminary Amendment at 2 (Defendants' Ex. LL, Dkt. No. 80-39 at 15), March 1, 2011

[37] https://www.merriam-webster.com/dictionary/dimension

[38] Defendants' Exhibit LL (Dkt. No. 80-39) is a variety of document segments that are ostensibly from the RE42,368 file wrapper. Dkt. No. 80-1 at ¶ 39. In some instances, the Court was unable to ascertain the nature of the various documents from the exhibit because Defendants did not submit sufficient portions of the documents. The Court's characterization of the individual documents in Exhibit LL comes from the Court's review of the file wrapper available on the USPTO's Public Patent Application Information Retrieval database, available at https://portal.uspto.gov/pair/PublicPair, and on the USPTO's Patent Center database, available at https://patentcenter.uspto.gov/#!/.

Replacement Reissue Application Declaration by Assignee at 2–3 (Defendants' Ex. LL, Dkt. No. 80-39 at 3–4); U.S. Patent No. RE42,678 File Wrapper[39] June 15, 2010 Preliminary Amendment at 2, 16 (Defendants' Ex. MM, Dkt. No. 80-40 at 3–4), January 31, 2011 Second Replacement Reissue Application Declaration by Assignee at 2 ((Defendants' Ex. MM, Dkt. No. 80-40 at 2); POR IPR2014-01166 at 7, 51 (Defendants' Ex. Y,[40] Dkt. No. 80-26 at 4, 14).

Plaintiff replies: The invention is not limited to movable beam-deflecting elements and controlling the elements in two dimensions does not require rotating the elements about two axes. Dkt. No. 83 at 13.

Plaintiff cites further **intrinsic evidence** to support its position: '905 Patent col.4 l.21, col.4 l.35.

Analysis

The issue in dispute is whether "controlling . . . in two dimensions" and "controllable in two dimensions" are necessarily limited to rotation about two axes. They are not.

Defendants have not identified anything that rises to the exacting standard for lexicography or disclaimer such that control in two dimensions should be recast as rotation about two axes. As stated above, Defendants have not established that all beam-deflecting elements are necessarily

[39] Defendants' Exhibit LL (Dkt. No. 80-40) is a variety of document segments that are ostensibly from the RE42,678 file wrapper. Dkt. No. 80-1 at ¶ 40. The Court was unable to ascertain the nature of the various documents from the exhibit because Defendants did not submit sufficient portions of the documents. The Court's characterization of the individual documents in Exhibit L comes from the Court's review of the file wrapper available on the USPTO's Public Patent Application Information Retrieval database, available at https://portal.uspto.gov/pair/PublicPair, and on the USPTO's Patent Center database, available at https://patentcenter.uspto.gov/#!/.

[40] Defendants cite pages 7 and 51 of their "Ex. M." Dkt. No. 80 at 32. Defendants' Ex. M (Dkt. No. 80-14) includes only excerpts from the Sergienko IPR2014-01166 Declaration and does not include a page 7 or a page 51. The quotation Defendants present as found on page 7 of Ex. M is found on page 7 of Ex. Y and the characterization of the argument purportedly on page 51 of Ex. M appears applicable to the argument on page 51 of Ex. Y.

movable or that control of elements necessarily entails moving the elements. Further, the Asserted Patents expressly provide that pivoting or rotation is an example of motion of the elements rather than being definitional of the motion. *See, e.g.*, '905 Patent col.4 ll. 28–32 ("A distinct feature of the channel micromirrors in the present invention, in contrast to those used in the prior art, is that the ***motion, e.g., pivoting (or rotation), of each channel micromirror*** is under analog control such that its pivoting angle can be [continuously] adjusted." (emphasis added)).

The Court rejects that the "dimensions" recited in the claims refers broadly to any quality of a beam-deflecting element rather than spatial dimensions, as Plaintiff argues. Plaintiff's position does not comport with the use of "dimension" in the Asserted Patents. Rather, the patents use "dimension" according to its customary "spatial" sense. *See, e.g.*, '905 Patent col.7 ll.59–63 ("The corresponding spectral channels diffracted from the diffraction grating 101 are generally elliptical in cross-section; they may be of the same size as the input beam in one dimension and elongated in the other dimension."), col.8 ll.23–26 ("By way of example, the channel micromirrors 103 are arranged in a one-dimensional array along the x-axis (i.e., the horizontal direction in the figure) . . .."), col.9 ll.38–40 ("The fiber collimators serving as the input and output ports may be arranged in a one-dimensional array, a two-dimensional array, or other desired spatial pattern."); *Merriam-Webster Dictionary Online*, "dimension" (defining "dimension" as "the quality of spatial extension" and "measure in one direction . . . specifically: one of three coordinates"), Dkt. No. 72-14. The Court understands that "dimension" may have other customary meanings relating to things such as time, properties of mathematical entities, lifelike qualities, and personality elements. *See Merriam-Webster Dictionary Online*, "dimension"). But in the context of the Asserted Patents, "dimension" refers to spatial dimensions. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc) ("The construction that stays true to the claim language and most naturally

aligns with the patent's description of the invention will be, in the end, the correct construction." (quotation marks omitted)); *Trs. of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359, 1363 (Fed. Cir. 2016) ("The only meaning that matters in claim construction is the meaning in the context of the patent.").

Accordingly, the Court construes these terms as follows:

- "said [beam-deflecting] elements being . . . controllable in two dimensions" means "said [beam-deflecting] elements being . . . controllable in two spatial dimensions"; and
- "controlling . . . said beam-deflecting elements in two dimensions" means "controlling . . . said beam-deflecting elements in two spatial dimensions."

F. "a control unit for controlling each of said beam-deflecting elements"

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"a control unit for controlling each of said beam-deflecting elements" • '905 Patent Claim 24	Plain and ordinary meaning. Capella specifically disagrees that construction under 35 U.S.C. §112(f)/¶6 is appropriate. Alternatively, • a controller capable of manipulating each beam-deflecting element	35 U.S.C. § 112(6) applies as follows: Function: • controlling each of said beam-deflecting elements Structure: • indefinite Alternatively, if § 112, ¶ 6 does not apply: • a control unit for controlling (as construed) each of said beam-deflecting elements (as construed)

The Parties' Positions

Plaintiff submits: To one of ordinary skill in the art, a "control unit" refers to known structure, "namely a controller." "In computing and especially computer hardware, a controller is a chip

(such as a microcontroller), an expansion card, or a stand-alone device that interfaces with a more peripheral device." As such, this term is not governed by 35 U.S.C. § 112, ¶ 6. Dkt. No. 72 at 21–23.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 Patent figs.4A, 4B, col.11 ll.42–56, col.12 ll.6–8. **Extrinsic evidence**: Sergienko Decl. ¶¶ 109–12, 115–19 (Dkt. No. 72-1); Wikipedia, The Free Encyclopedia, Controller (computing)[41] (Oct. 10, 2020) (Plaintiff's Ex. 9, Dkt. No. 72-15).

Defendants respond: The terms "'control unit,' 'processing unit,' 'power management system,' and 'servo-control assembly' are all indefinite means-plus-function terms." "Each of these black boxes is a general-purpose computer or performs recited functions via a general-purpose computer." And since the Asserted Patents fail to provide any algorithms for performing the claim-recited functions, the term renders '905 Patent Claim 24 indefinite. Dkt. No. 80 at 34–35.

In addition to the claims themselves, Defendants cite the following intrinsic and extrinsic evidence to support their position: **Intrinsic evidence**: '905 Patent figs.4A, 4B, col.11 l.25 – col.12 l.26, col.12 ll.30–33. **Extrinsic evidence**: Sergienko Dep. at 176:18 – 177:22, 180:12 – 181:12 (Defendants' Ex. R, Dkt. No. 80-19 at 41–44); Sergienko IPR Dep. at 80:12–23, 193:7–13 (Defendants' Ex. Q, Dkt. No. 80-18 at 8, 23); Willner Decl. ¶¶ 114–15 (Dkt. No. 80-41).

Analysis

There appear to be three issues in dispute. First, whether this term should be governed by 35 U.S.C. § 112, ¶ 6. Second, if the term is governed by § 112, ¶ 6, whether the '905 Patent satisfies

[41] https://en.wikipedia.org/wiki/Controller_(computing)

the disclosure requirements of the statute. Third, if the term is not governed by § 112, ¶ 6, whether the control unit controls beam-deflecting elements as Defendants construe "controlling" and "beam-deflecting elements." The Court determines that this term is not governed by § 112, ¶ 6 and therefore does not address the second issue. With respect to the third issue, the Court reiterates its above rulings on "beam-deflecting element" and what it means to control a beam-deflecting element.

Defendants have not overcome the presumption against applying § 112, ¶ 6. Specifically, the Court understands that "control unit" refers to a well-known class of structures also known as controllers. *See* Sergienko Decl. ¶¶ 110, 112, Dkt. No. 72-1. Indeed, the term "control unit" was in claims that were addressed in the various IPR and Reissue proceedings and there is no indication in the record that the term was treated as anything other than a name for structure.

Accordingly, the Court rejects Defendants' proposed construction and determines that this term has its plain and ordinary meaning without the need for further construction.

G. "a processing unit . . . for . . ."

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"a processing unit responsive to said power levels for controlling said beam-deflecting elements" • '905 Patent Claim 25	Plain and ordinary meaning. Capella specifically disagrees that construction under 35 U.S.C. §112(f)/¶6 is appropriate. Alternatively, • a processor capable of manipulating each beam-deflecting element	35 U.S.C. § 112(6) applies as follows: Function: • responsive to said power levels for controlling said beam-deflecting elements responsive said power levels Structure: • indefinite Alternatively, if § 112, ¶ 6 does not apply: • a processing unit responsive to said power levels for controlling (as construed) said beam-deflecting elements (as construed)
"a processing unit responsive to said power levels for providing control of said channel micromirrors" • '906 Patent Claims 70, 90, 117		35 U.S.C. § 112(6) applies as follows: Function: • responsive to said power levels for providing control of said channel micro mirrors Structure: • indefinite Alternatively, if § 112, ¶ 6 does not apply: • a processing unit responsive to said power levels for providing control (as construed) of said channel micromirrors (as construed)

Because the parties' arguments and proposed constructions with respect to these terms are related, the Court addresses the terms together.

The Parties' Positions

Plaintiff submits: To one of ordinary skill in the art, a "processing unit" refers to known structure, "namely a processor." "In computing, a processor or processing unit is a digital circuit which performs operations on some external data source, usually memory or some other data stream." As such, this term is not governed by 35 U.S.C. § 112, ¶ 6. Dkt. No. 72 at 23–25.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 Patent figs.4A, 4B, col.11 l.25 – col.12 l.61. **Extrinsic evidence**: Sergienko Decl. ¶¶ 120–23, 126–30 (Dkt. No. 72-1); Wikipedia, The Free Encyclopedia, Processor (computing)[42] (Nov. 7, 2020) (Plaintiff's Ex. 10, Dkt. No. 72-16).

Defendants respond: The terms "'control unit,' 'processing unit,' 'power management system,' and 'servo-control assembly' are all indefinite means-plus-function terms." "Each of these black boxes is a general-purpose computer or performs recited functions via a general-purpose computer." And since the Asserted Patents fail to provide any algorithms for performing the claim-recited functions, the terms render claims indefinite. Dkt. No. 80 at 34–35.

In addition to the claims themselves, Defendants cite the following intrinsic and extrinsic evidence to support their position: **Intrinsic evidence**: '905 Patent figs.4A, 4B, col.11 l.25 – col.12 l.26, col.12 ll.30–33. **Extrinsic evidence**: Sergienko Dep. at 176:18 – 177:22, 180:12 – 181:12 (Defendants' Ex. R, Dkt. No. 80-19 at 41–44); Sergienko IPR Dep. at 80:12–23, 193:7–13 (Defendants' Ex. Q, Dkt. No. 80-18 at 8, 23); Willner Decl. ¶¶ 114–15 (Dkt. No. 80-41).

Analysis

There appear to be three issues in dispute. First, whether these terms should be governed by 35 U.S.C. § 112, ¶ 6. Second, if the terms are governed by § 112, ¶ 6, whether the Asserted Patents

[42] https://en.wikipedia.org/wiki/Processor_(computing)

satisfies the disclosure requirements of the statute. Third, if the terms are not governed by § 112, ¶ 6, whether the processing unit controls beam-deflecting elements or channel micromirrors as Defendants construe "controlling," "beam-deflecting elements," and "channel micromirrors." The Court determines that these terms are not governed by § 112, ¶ 6 and therefore does not address the second issue. With respect to the third issue, the Court reiterates its above rulings on "beam-deflecting element" and what it means to control a beam-deflecting element/channel micromirror and refers to the ruling below regarding "channel micromirrors."

Defendants have not overcome the presumption against applying § 112, ¶ 6. Specifically, the Court understands that "processing unit" refers to a well-known class of structures also known as processors. *See* Sergienko Decl. ¶¶ 121, 128, Dkt. No. 72-1. Indeed, the term "processing unit" was in claims that were addressed in the various IPR and Reissue proceedings and there is no indication in the record that the term was treated as anything other than a name for structure.

Accordingly, the Court rejects Defendants' proposed constructions and determines that these terms have their plain and ordinary meanings without the need for further construction.

H. "a power-management system configured to manage power levels of at least one of the first spectral channels and the second spectral channels"

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"a power-management system configured to manage power levels of at least one of the first spectral channels and the second spectral channels" • '905 Patent Claim 44	Plain and ordinary meaning. Capella specifically disagrees that construction under 35 U.S.C. §112(f)/¶6 is appropriate. Alternatively, • controller (manager) to manage power levels	35 U.S.C. § 112(6) applies as follows: Function: • manage power levels of at least one of the first spectral channels and the second spectral channels Structure: • indefinite Alternatively, if § 112, ¶ 6 does not apply: • plain and ordinary meaning

The Parties' Positions

Plaintiff submits: To one of ordinary skill in the art, a "power-management system" refers to sufficiently definite structure. As such, this term is not governed by 35 U.S.C. § 112, ¶ 6. Dkt. No. 72 at 25–26.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 Patent figs.4A, 4B, col.11 l.25 – col.12 l.61. **Extrinsic evidence**: Sergienko Decl. ¶¶ 131–32 (Dkt. No. 72-1).

Defendants respond: The terms "'control unit,' 'processing unit,' 'power management system,' and 'servo-control assembly' are all indefinite means-plus-function terms." "Each of these black boxes is a general-purpose computer or performs recited functions via a general-purpose computer." And since the Asserted Patents fail to provide any algorithms for performing the claim-recited functions, the terms render claims indefinite. Dkt. No. 80 at 34–35.

In addition to the claims themselves, Defendants cite the following intrinsic and extrinsic evidence to support their position: **Intrinsic evidence**: '905 Patent figs.4A, 4B, col.11 l.25 – col.12 l.26, col.12 ll.30–33. **Extrinsic evidence**: Sergienko Dep. at 176:18 – 177:22, 180:12 – 181:12 (Defendants' Ex. R, Dkt. No. 80-19 at 41–44); Sergienko IPR Dep. at 80:12–23, 193:7–13 (Defendants' Ex. Q, Dkt. No. 80-18 at 8, 23); Willner Decl. ¶¶ 114–15 (Dkt. No. 80-41).

Analysis

There appear to be two issues in dispute. First, whether this term should be governed by 35 U.S.C. § 112, ¶ 6. Second, if the term is governed by § 112, ¶ 6, whether the '905 Patent satisfies the disclosure requirements of the statute. The Court determines that this term is not governed by § 112, ¶ 6 and therefore does not address the second issue.

Defendants have not overcome the presumption against applying § 112, ¶ 6. Specifically, the Court understands that "power management system" refers to a well-known class of structures. *See* Sergienko Decl. ¶¶ 131–32, Dkt. No. 72-1. Indeed, the term "power-management system" was in claims that were addressed in the Reissue proceedings and there is no indication in the record that the term was treated as anything other than a name for structure.

Accordingly, the Court rejects Defendants' proposed construction and determines that this term has its plain and ordinary meaning without the need for further construction.

I. "a servo-control assembly . . . for . . ."

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"a servo-control assembly . . . for monitoring power levels of selected ones of selected channels" • '905 Patent Claim 25	Plain and ordinary meaning. Capella specifically disagrees that construction under 35 U.S.C. §112(f)/¶6 is appropriate. Alternatively, • "servo" means: a controller that uses feedback to control power • "assembly" means "a collection of parts or components"	35 U.S.C. § 112(6) applies as follows: Function: • monitoring power levels of selected ones of said spectral channels Structure: • indefinite Alternatively, if § 112, ¶ 6 does not apply: • plain and ordinary meaning
"a servo-control assembly . . . for providing control of said channel micromirrors and thereby maintaining a predetermined coupling of each reflected spectral channel into one of said fiber collimator output ports" • '906 Patent Claim 69		35 U.S.C. § 112(6) applies as follows: Function: • providing control of said channel micromirrors and thereby maintaining a predetermined coupling of each reflected spectral channel into one of said fiber collimator output ports Structure: • indefinite Alternatively, if § 112, ¶ 6 does not apply: • plain and ordinary meaning

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"a servo-control assembly . . . for maintaining a predetermined coupling of each reflected spectral channel into one of said fiber collimator output ports" • '906 Patent Claim 89		35 U.S.C. § 112(6) applies as follows: Function: • maintaining a predetermined coupling of each reflected spectral channel into one of said fiber collimator output port Structure: • indefinite Alternatively, if § 112, ¶ 6 does not apply: • plain and ordinary meaning
"a servo-control assembly, in communication with said channel micromirrors and said output ports, for providing control of said channel micromirrors and thereby maintaining a predetermined coupling of each reflected spectral channel into one of said output ports" • '906 Patent Claim 116		35 U.S.C. § 112(6) applies as follows: Function: • providing control of said channel micromirrors and thereby maintaining a predetermined coupling of each reflected spectral channel into one of said output ports Structure: • indefinite Alternatively, if § 112, ¶ 6 does not apply: • plain and ordinary meaning

Because the parties' arguments and proposed constructions with respect to these terms are related, the Court addresses the terms together.

The Parties' Positions

Plaintiff submits: To one of ordinary skill in the art, a "servo-control assembly" refers to known structure, "namely a servo." "A servo is a foundational building block of optical systems,

and is well-known in the art. Servos provide corrective control based on feedback." As such, this term is not governed by 35 U.S.C. § 112, ¶ 6. Dkt. No. 72 at 26–27.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 Patent figs.4A, 4B, col.11 l.25 – col.12 l.61. **Extrinsic evidence**: Sergienko Decl. ¶¶ 141, 143, 146–48 (Dkt. No. 72-1); *Merriam-Webster Dictionary Online*, "assembly"[43] (Plaintiff's Ex. 11, Dkt. No. 72-17).

Defendants respond: The terms "'control unit,' 'processing unit,' 'power management system,' and 'servo-control assembly' are all indefinite means-plus-function terms." "Each of these black boxes is a general-purpose computer or performs recited functions via a general-purpose computer." And since the Asserted Patents fail to provide any algorithms for performing the claim-recited functions, the terms render claims indefinite. Dkt. No. 80 at 34–35.

In addition to the claims themselves, Defendants cite the following intrinsic and extrinsic evidence to support their position: **Intrinsic evidence**: '905 Patent figs.4A, 4B, col.11 l.25 – col.12 l.26, col.12 ll.30–33. **Extrinsic evidence**: Sergienko Dep. at 176:18 – 177:22, 180:12 – 181:12 (Defendants' Ex. R, Dkt. No. 80-19 at 41–44); Sergienko IPR Dep. at 80:12–23, 193:7–13 (Defendants' Ex. Q, Dkt. No. 80-18 at 8, 23); Willner Decl. ¶¶ 114–15 (Dkt. No. 80-41).

Analysis

There appear to be two issues in dispute. First, whether these terms should be governed by 35 U.S.C. § 112, ¶ 6. Second, if these terms are governed by § 112, ¶ 6, whether the Asserted Patents satisfy the disclosure requirements of the statute. The Court determines that these terms are not governed by § 112, ¶ 6 and therefore does not address the second issue.

[43] https://www.merriam-webster.com/dictionary/assembly

Defendants have not overcome the presumption against applying § 112, ¶ 6. Specifically, the Court understands that "servo-control assembly" refers to a well-known class of structures. *See* Sergienko Decl. ¶¶ 142–43, Dkt. No. 72-1. Indeed, the term "servo-control assembly" was in claims that were addressed in the various IPR and Reissue proceedings and there is no indication in the record that the term was treated as anything other than a name for structure.

Accordingly, the Court rejects Defendants' proposed constructions and determines that these terms have their plain and ordinary meanings without the need for further construction.

J. "channel micromirrors," "mirror[s]," "micromirror[s]," and "micromachined mirror[s]"

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"channel micromirrors" • '906 Patent Claims 68, 89, 100, 115	Mirrored or reflective surfaces for reflecting light. One of ordinary skill in the art would understand "micromirrors" and "micromachined mirrors" to mean small mirrored or reflective surfaces for reflecting light. A "channel micromirror," in light of the specifications and claims, means a small mirror that is positioned to receive one of the spectral channels.	[a movable mirror] / [movable mirrors, each] assigned to a specific spectral channel
"mirror[s]" • '905 Patent Claim 29		
"micromirror[s]" • '905 Patent Claim 46		
"micromachined mirror[s]" • '905 Patent Claim 35		

Because the parties' arguments and proposed constructions with respect to these terms are related, the Court addresses the terms together.

The Parties' Positions

Plaintiff submits: A "mirror" is a mirrored or reflective surface for reflecting light. The terms "micromirror" and "micromachined mirror" each refers to small mirrors. And a "channel micromirror" is "a small minor or reflective surface[] that [is] positioned to receive one of the

spectral channels." None of these mirrors are necessarily movable or assigned to a specific spectral channel. Dkt. No. 72 at 28–29.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 Patent col.4 ll.9–16, col.9 ll.22–25. **Extrinsic evidence**: Sergienko Decl. ¶¶ 150–51 (Dkt. No. 72-1).

Defendants respond: The ordinary meaning of "channel micromirror" is a "movable mirror assigned to a specific spectral channel." The Asserted Patents acknowledge and expressly reiterate this meaning and its importance to the invention (citing, e.g., '905 Patent col.4 ll.9–16, col.4 ll.19–22). And the patents describe that micromachined mirrors and other beam-deflecting elements are species of channel micromirrors and thus have the characteristics of the channel micromirrors (citing *id*. at col.9 ll.22–25). Dkt. No. 80 at 19–23.

In addition to the claims themselves, Defendants cite the following intrinsic and extrinsic evidence to support their position: **Intrinsic evidence**: '905 Patent, at [57] Abstract, col.4 ll.9–16, col.4 ll.19–26, col.7 ll.20–23, col.8 ll.30–32, col.8 ll.38–41, col.8 ll.64–67, col.9 ll.22–31, col.9 ll.43–48. **Extrinsic evidence**: Sergienko Dep. at 142:16 – 144:16 (Defendants' Ex. R, Dkt. No. 80-19 at 36–38); Sergienko IPR2014-01166 Decl.[44] ¶ 58 (Defendants' Ex. M, Dkt. No. 80-14); Sergienko IPR2014-01276 Decl.[45] ¶ 58 (Defendants' Ex. N, Dkt. No. 80-15); Sergienko IPR2015-

[44] Declaration of Dr. Alexander V. Sergienko in Support of the Patent Owner Response, *Cisco Systems, Inc. v. Capella Photonics*, Inc., IPR2014-01166 (Patent No. RE42,368) (P.T.A.B. May 7, 2015), exhibit 2004.

[45] Declaration of Dr. Alexander V. Sergienko in Support of the Patent Owner Response, *Cisco Systems, Inc. v. Capella Photonics*, Inc., IPR2014-01276 (Patent No. RE42,678) (P.T.A.B. May 18, 2015), exhibit 2004.

00726 Decl.[46] ¶ 69 (Defendants' Ex. U, Dkt. No. 80-22); Sergienko IPR2015-00727 Decl.[47] ¶ 69 (Defendants' Ex. V, Dkt. No. 80-23).

Plaintiff replies: Defendants seek to improperly limit claim scope to an exemplary embodiment. Dkt. No. 83 at 11.

Analysis

There appear to be two issues in dispute. First, whether all the mirror terms necessarily refer to "channel micromirrors." They do not. Second, whether each of the various mirrors are: (1) movable and (2) assigned to a specific spectral channel. While the channel micromirrors necessarily have these attributes, the others are not so limited.

Not all mirrors in the Asserted Patents are "channel micromirrors." For example, the Asserted Patents provide that "[t]he channel micromirrors may be provided by silicon micromachined mirrors, reflective ribbons (or membranes), or other types of beam-deflecting elements known in the art." '905 Patent col.9 ll.22–25. As set forth above in the section on beam-deflecting elements, the Court is not convinced that micromachined mirrors, ribbons, and beam-deflecting elements are species of channel micromirrors. Rather, these are elements that can "provide" the channel micromirrors. The patents also describe mirrors that work with channel micromirrors but are not, and do not provide, the channel micromirrors. *See, e.g., id.* at fig.2A, col.9 l.57 – col.10 l.11 (describing "collimator-alignment mirrors 220-1 through 220-N" that are distinct from the channel micromirrors). Finally, the fact that some claims recite "channel micromirrors" and others claims

[46] Declaration of Dr. Alexander V. Sergienko in Support of the Patent Owner Response, *Cisco Systems, Inc. v. Capella Photonics*, Inc., IPR2015-00726 (Patent No. RE42,368) (P.T.A.B. Dec. 23, 2015), exhibit 2033.
[47] Declaration of Dr. Alexander V. Sergienko in Support of the Patent Owner Response, *Cisco Systems, Inc. v. Capella Photonics*, Inc., IPR2015-00727 (Patent No. RE42,678) (P.T.A.B. Dec. 23, 2015), exhibit 2033.

recite other types of mirrors suggest that not all mirrors in the claims are channel micromirrors. *See Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012) (recognizing "when different words are used in separate claims, they are presumed to have different meanings" (internal citation omitted)).

The Asserted Patents describe movability and assignment to a specific spectral channel as inherent features of the channel micromirrors of the present invention. For instance, the patents provide:

> ***The channel micromirrors are individually controllable and movable,*** e.g., continuously pivotable (or rotatable), so as to reflect the spectral channels into selected ones of the output ports. ***As such, each channel micromirror is assigned to a specific spectral channel, hence the name "channel micromirror"***. And each output port may receive any number of the reflected spectral channels.
>
> ***A distinct feature of the channel micromirrors in the present invention, in contrast to those used in the prior art, is that the motion,*** e.g., pivoting (or rotation), of each channel micromirror is under analog control such that its pivoting angle can be continuously adjusted. This enables each channel micromirror to scan its corresponding spectral channel across all possible output ports and thereby direct the spectral channel to any desired output port.

'905 Patent col.4 ll.11–26 (emphasis added); *see also, id*. at col.7 ll.26–29 ("As such, each channel micromirror is assigned to a specific spectral channel, hence the name "channel micromirror".); *id*. at col.8 ll.38–40 ("As described above, a unique feature of the present invention is that the motion of each channel micromirror is individually and continuously controllable . . .."). These passages clearly establish that the term "channel micromirror" inherently carries the meaning that it is assigned to a specific spectral channel and that the channel micromirrors of the "present invention" are inherently movable.

Accordingly, the Court rejects Defendants' proposed constructions, determines that "mirror[s]," "micromirror[s]," and "micromachined mirror[s]" have their plain and ordinary

meanings without the need for further construction, and construes "channel micromirror" as follows:

- "channel micromirror" means "movable micromirror assigned to a specific spectral channel."

K. "corresponding"

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"corresponding" • '905 Patent Claims 23, 47, 49, 51 • '906 Patent Claims 68, 89, 100, 115, 133	Plain and ordinary meaning. Alternatively, • assigned	in one-to-one correspondence

The Parties' Positions

Plaintiff submits: The term "corresponding" is used in a variety of contexts in the Asserted Patents and is not limited to a "one-to-one correspondence." Limiting "corresponding" to a one-to-one correspondence would improperly limit language in some claims and render language in other claims superfluous. And the patents express "one-to-one correspondence" where that meaning is intended. Dkt. No. 72 at 29–30.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 col.7 ll.42–45, col.7 ll.57–61, col.10 ll.2–9, col.13 ll.16–21. **Extrinsic evidence**: Sergienko Decl. ¶¶ 152–54 (Dkt. No. 72-1).

Defendants respond: The language of the claims requires one-to-one correspondence. And as described in the Asserted Patents, each spectral channel is necessarily associated with one beam-deflecting element. Dkt. No. 80 at 32–34.

In addition to the claims themselves, Defendants cite the following **intrinsic evidence** to support their position: '905 Patent col.4 ll.14–16, col.4 ll.23–26, col.7 ll.12–20, col.7 ll.26–27, col.8 ll.42–45, col.8 ll.64–67, col.10 ll.2–9, col.13 ll.16–21.

Analysis

The issue in dispute distills to whether "corresponding" in the claims necessarily requires a one-to-one correspondence. It does not.

Defendants have not identified anything that rises to the exacting standard for lexicography or disclaimer such that "corresponding" should be limited to one-to-one correspondence. The Asserted Patents use the term "one-to-one correspondence" in describing certain embodiments. *See, e.g.*, '905 Patent col.7 ll.12–17 ("The diffraction grating 101 angularly separates the multi-wavelength optical signal into multiple spectral channels, which are in turn focused by the focusing lens 102 into a spatial array of distinct spectral spots (not shown in FIG. 1A) in a one-to-one correspondence."), col.10 ll.2–5 ("The collimator-alignment mirrors 220-2 through 220-N are designated to the output ports 110-2 through 110-N in a one-to-one correspondence . . .."). The fact that this correspondence is expressed as "one-to-one" correspondence suggests that "correspondence" is not inherently one-to-one. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc) (noting that the use of the term "steel baffles" "strongly implies that the term 'baffles' does not inherently mean objects made of steel"). This distinction also shows up in the claims. For example, Claim 133 of the '906 Patent provides "focusing said spectral channels onto a spatial array of corresponding beam-deflecting elements, whereby each beam-deflecting element receives one of said spectral channels." '906 Patent col.26 ll.10–13. This language expresses that each "corresponding" element "receives one of" the channels. That such a limitation is expressed in the claims suggests that it is not inherent to "corresponding," as would be the case

if corresponding necessarily required one-to-one correspondence. On balance, the evidence suggests that "corresponding" alone does not carry the meaning Defendants advocate.

Accordingly, the Court rejects Defendants' proposed construction and determines that "corresponding" has its plain and ordinary meaning without the need for further construction.

L. ". . . individually . . . controllable," ". . . individually pivotable"

Disputed Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"said elements being individually . . . controllable" • '905 Patent Claims 23, 47, 49	plain an ordinary meaning	each [channel micromirror (as construed) / beam-deflecting element (as construed)] being [controlled (as construed) / pivoted] separately from all other [channel micromirrors (as construed) / beam-deflecting elements (as construed)]
"said channel micromirrors . . . being individually . . . controllable" • '906 Patent Claims 68, 115		
"said channel micromirrors being individually controllable" • '906 Patent Claim 89		
"said channel micromirrors being individually . . . controllable" • '906 Patent Claim 100		
"said auxiliary channel micromirrors are individually pivotable" • '906 Patent Claim 127		

Because the parties' arguments and proposed constructions with respect to these terms are related, the Court addresses the terms together.

The Parties' Positions

Plaintiff submits: The word "individually" in these terms "is used in a normal sense to mean that each element can be controlled." While the individual beam-deflecting elements may be controlled separately from the other beam-deflecting elements, "separate control is not required." Dkt. No. 72 at 30–31.

In addition to the claims themselves, Plaintiff cites the following intrinsic and extrinsic evidence to support its position: **Intrinsic evidence**: '905 Patent col.4 ll.11–14, col.5 l.64 – col.6 l.2. **Extrinsic evidence**: Sergienko Decl. ¶¶ 155–56 (Dkt. No. 72-1).

Defendants respond: The word "individually" in these terms "is used in its ordinary sense to mean that each element or micromirror is being controlled separately from the other elements or micromirrors." Dkt. No. 80 at 30–31.

In addition to the claims themselves, Defendants cite the following intrinsic and extrinsic evidence to support their position: **Intrinsic evidence**: '905 Patent col.5 l.64 – col.6 l.2, col.9 ll.26–29. **Extrinsic evidence**: *The American Heritage Dictionary* at 658 (2d college ed. 1991), "individually" (Defendants' Ex. Z, Dkt. No. 80-27 at 4); *Webster's New World Dictionary* at 688 (3d college ed. 1994), "individually" (Defendants' Ex. AA, Dkt. No. 80-28 at 4).

Analysis

The issue in dispute appears to distill to whether individually controllable elements are necessarily controlled separately from other elements. They are not necessarily controlled separately, but they are necessarily separately controllable.

Each of these terms is directed to capability rather than action. As recited, each of the elements (or micromirrors or channel micromirrors) is individually "controllable" or "pivotable." This plainly does not require actual control, individual or otherwise. Thus, the Court rejects Defendants'

proposed "being controlled" and "being pivoted" language. Further, the claim language does not preclude any capability. Thus, elements that are controllable both individually and collectively are still controllable individually. Even if at times, in operation, they are controlled collectively.

Accordingly, the Court construes these terms as follows:

- "said elements being individually . . . controllable" means "each of the elements being controllable separately from the other elements";
- "said channel micromirrors . . . being individually . . . controllable" means "each of the micromirrors being controllable separately from the other micromirrors";
- "said channel micromirrors being individually controllable" means "each of the channel micromirrors being controllable separately from the other channel micromirrors";
- "said channel micromirrors being individually . . . controllable" means "each of the channel micromirrors being controllable separately from the other channel micromirrors"; and
- "said auxiliary channel micromirrors are individually pivotable" means "each of the auxiliary channel micromirrors being pivotable separately from the other auxiliary channel micromirrors."

IV. CONCLUSION

The Court adopts the constructions above for the disputed terms. Furthermore, the parties should ensure that all testimony that relates to the terms addressed in this Order is constrained by the Court's reasoning. However, in the presence of the jury the parties should not expressly or implicitly refer to each other's claim construction positions and should not expressly refer to any portion of this Order that is not an actual construction adopted by the Court. The references to the

claim construction process should be limited to informing the jury of the constructions adopted by the Court.

SIGNED this 9th day of February, 2021.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE