

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

OYSTER OPTICS, LLC,

Plaintiff,

v.

ALCATEL-LUCENT USA, INC. ,

Defendant.

Civil Action No. 2:16-cv-1297

JURY TRIAL DEMANDED

AMENDED COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement arising under the Patent Laws of the United States of America, 35 U.S.C. § 1 *et seq.* in which Plaintiff Oyster Optics, LLC (“Oyster” or “Plaintiff”) makes the following allegations against Alcatel-Lucent USA, Inc. (“Defendant”).

PARTIES

1. Oyster Optics, LLC is a Texas company, and has a place of business at 11921 Freedom Drive, Suite 550, Reston, VA 20190.
2. On information and belief, Alcatel-Lucent USA, Inc. is a Delaware corporation with a place of business at 601 Data Drive, Plano, TX 75075. On information and belief, Nokia Corporation acquired Alcatel-Lucent USA Inc.’s parent, Alcatel Lucent S.A., in 2016.

JURISDICTION AND VENUE

3. This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

4. This Court has personal jurisdiction over Defendant in this action because, among other reasons, Defendant has committed acts within the Eastern District of Texas giving rise to this action and has established minimum contacts with the forum state of Texas. Defendant directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has committed and continues to commit acts of infringement in this District by, among other things, making, using, importing, offering for sale, and/or selling products and/or services that infringe the patents-in-suit. Thus, Defendant purposefully availed itself of the benefits of doing business in the State of Texas and the exercise of jurisdiction over Defendant would not offend traditional notions of fair play and substantial justice. Defendant maintains a place of business in Plano Texas, and is registered to do business in the State of Texas, appointing Prentice Hall Corporation System, 211 E. 7th Street, Ste. 620, Austin, TX 78701 as its agent for service of process.

5. Venue is proper in this District under 28 U.S.C. §§ 1391(b)-(c) and 1400(b) because Defendant is subject to personal jurisdiction in this District, have transacted business in this District and have committed acts of patent infringement in this District.

BACKGROUND

6. In the early 2000s, Oyster Optics, Inc., a research, development, and engineering company, was focused upon innovation in government, commercial, security, and broad-band applications of leading edge fiber optics technology. Mr. Peter (“Rocky”) Snawerdt was at Oyster Optics, Inc. when he invented the subject matter of U.S. Patent Nos. 6,469,816; 6,476,952; 6,594,055; 7,099,592; 7,620,327; 8,374,511; 8,913,898, and 9,363,012 (collectively, “asserted patents” or “patents-in-suit”).

7. Oyster is the owner by assignment of United States Patent No. 6,469,816 (“the ’816 Patent”) entitled “Phase-Modulated Fiber Optic Telecommunications System.” The ’816 Patent was duly and legally issued by the United States Patent and Trademark Office on October 22, 2002. A true and correct copy of the ’952 Patent is included as Exhibit A.

8. Oyster is the owner by assignment of United States Patent No. 6,476,952 (“the ’952 Patent”) entitled “Phase-Modulated Fiber Optic Telecommunications System.” The ’952 Patent was duly and legally issued by the United States Patent and Trademark Office on November 5, 2002. A true and correct copy of the ’952 Patent is included as Exhibit B.

9. Oyster is the owner by assignment of United States Patent No. 6,594,055 (“the ’055 Patent”) entitled “Secure Fiber Optic Telecommunications System and Method.” The ’055 Patent was duly and legally issued by the United States Patent and Trademark Office on July 15, 2003. A true and correct copy of the ’055 Patent is included as Exhibit C.

10. Oyster is the owner by assignment of United States Patent No. 7,099,592 (“the ’592 Patent”) entitled “Telecommunications Card for Secure Optical Data Transmission and Installation Method.” The ’592 Patent was duly and legally issued by the United States Patent and Trademark Office on August 29, 2006. A true and correct copy of the ’592 Patent is included as Exhibit D.

11. Oyster is the owner by assignment of United States Patent No. 7,620,327 (“the ’327 Patent”) entitled “Fiber Optic Telecommunications Card with Energy Level Monitoring.” The ’327 Patent was duly and legally issued by the United States Patent and Trademark Office on November 17, 2009. A true and correct copy of the ’327 Patent is included as Exhibit E.

12. Oyster is the owner by assignment of United States Patent No. 8,374,511 (“the ’511 Patent”) entitled “Fiber Optic Telecommunications Card with Energy Level Monitoring.”

The '511 Patent was duly and legally issued by the United States Patent and Trademark Office on February 12, 2013. A true and correct copy of the '511 Patent is included as Exhibit F.

13. Oyster is the owner by assignment of United States Patent No. 8,913,898 (“the '898 Patent”) entitled “Fiber Optic Telecommunications Card with Energy Level Monitoring.” The '898 Patent was duly and legally issued by the United States Patent and Trademark Office on December 16, 2014. A true and correct copy of the '898 Patent is included as Exhibit G.

14. Oyster is the owner by assignment of United States Patent No. 9,363,012 (“the '012 Patent”) entitled “Fiber Optic Telecommunications Card with Energy Level Monitoring.” The '012 Patent was duly and legally issued by the United States Patent and Trademark Office on June 7, 2016. A true and correct copy of the '012 Patent is included as Exhibit H.

COUNT I

INFRINGEMENT OF THE '816 PATENT

15. Oyster references and incorporates by reference paragraphs 1 through 14 of this Complaint.

16. On information and belief, Defendant makes, uses, offers for sale and/or sells in the United States the Accused Instrumentalities that infringe various claims of the '816 Patent, and continues to do so. These products include, for example, Defendant's platforms, their compatible modules, devices, and components such as the 1830 Photonic Service Switch, 1620 Light Manager, 1625 LambdaXtreme Transport, and 1626 Light Manager.¹ The exemplary infringing products shall be referred to hereinafter as the “40G Accused Instrumentalities.”

¹ See, e.g., *Portfolio - Optical Networking*, NOKIA, [https://networks.nokia.com/portfolio-explorer?f\[0\]=field_facet_function%3A8786](https://networks.nokia.com/portfolio-explorer?f[0]=field_facet_function%3A8786) (last visited Oct. 27, 2016); *1830 Photonic Service Switch*, NOKIA, <https://networks.nokia.com/products/1830-photonic-service-switch> (last visited Oct. 27, 2016); *1620 Light Manager*, NOKIA, <https://networks.nokia.com/products/1620-light-manager> (last visited Oct. 27, 2016); *1625 LambdaXtreme Transport*, NOKIA,

17. On information and belief, the 40G Accused Instrumentalities are a fiber optic data transmission system. For example, Alcatel-Lucent published a study (“Alcatel-Lucent Study”) which used one of the 40G Accused Instrumentalities – the Alcatel-Lucent 1626LM. The figure below shows that the Alcatel-Lucent 1626LM is a fiber optic data transmission system.²

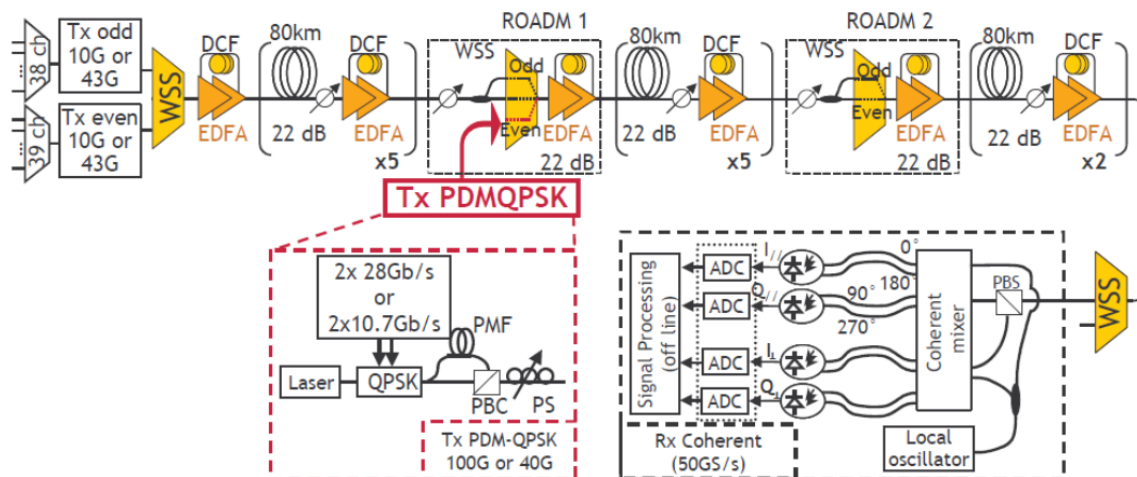


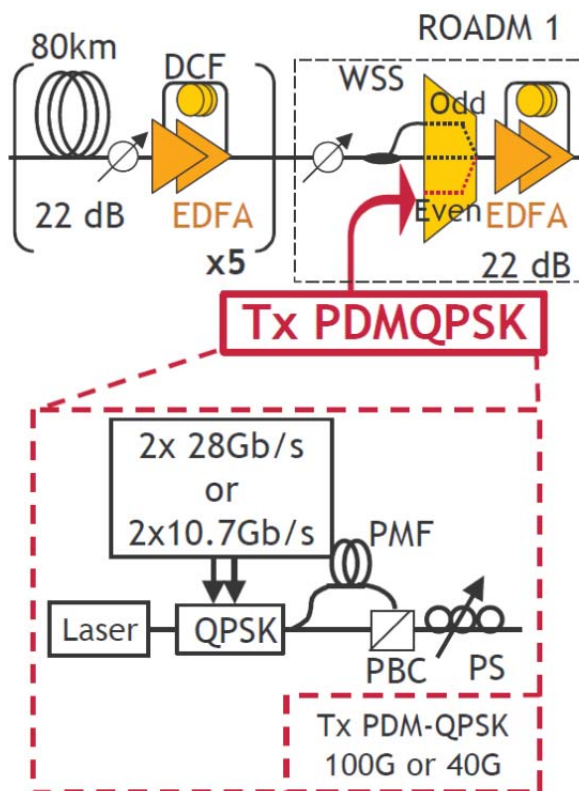
Fig. 1 : WDM transmission setup based on the Alcatel-Lucent 1626LM equipment

18. On information and belief, the 40G Accused Instrumentalities comprise a transmitter having a laser emitting a continuous wave light. For example, the Alcatel-Lucent Study stated that “[t]he light from a narrow linewidth tuneable laser is sent to a QPSK modulator,” as shown in the figure below.³

<https://networks.nokia.com/products/1625-lambdaxtreme-transport> (last visited Oct. 27, 2016); and 1626 LIGHT MANAGER, NOKIA, <https://networks.nokia.com/products/1626-light-manager> (last visited Oct. 27, 2016). (Nokia Corporation acquired Alcatel-Lucent in 2016.)

² Renaudier, J. et al. (2009, March). Performance comparison of 40G and 100G coherent PDM-QPSK for upgrading dispersion managed legacy systems. In *National Fiber Optic Engineers Conference* (p. NWD5). Optical Society of America.

³ Renaudier, J. et al. (2009, March). Performance comparison of 40G and 100G coherent PDM-QPSK for upgrading dispersion managed legacy systems. In *National Fiber Optic Engineers Conference* (p. NWD5). Optical Society of America.



19. On information and belief, the 40G Accused Instrumentalities comprise a phase modulator phase modulating the continuous wave light as a function of an electronic input data stream and of an electronic feedback loop with a feedback time delay, the electronic feedback loop being fed back to the electronic input data stream, so as to create an optical signal bearing information in phase- modulated form. For example, the Alcatel-Lucent Study stated that “[t]he . . . coherent PDM-QPSK signal is generated using the equipment depicted in Fig.1. The light from a narrow linewidth tuneable laser is sent to a QPSK modulator . . . which is fed by 215-1-bit-long sequences, including 7% Forward Error Correction (FEC) and protocol overhead.”⁴

20. On information and belief, the 40G Accused Instrumentalities comprise a telecommunications optical fiber connected to at least one receiver, the phase-modulator being

⁴ Renaudier, J. et al. (2009, March). Performance comparison of 40G and 100G coherent PDM-QPSK for upgrading dispersion managed legacy systems. In *National Fiber Optic Engineers Conference* (p. NWD5). Optical Society of America.

connected to the telecommunications fiber so that the phase-modulated information optical signal is transmitted over the telecommunications fiber without recombining with the continuous wave light. As an example, the Alcatel-Lucent Study disclosed that “[a]t the end of the transmission line, the PDM-QPSK channel under test is selected by the WSS of the tuneable terminal and sent to the coherent receiver.”⁵

21. On information and belief, Defendant has directly infringed and continues to directly infringe the ’816 Patent by, among other things, making, using, offering for sale, and/or selling the ’816 40G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the ’816 Patent’s including at least claim 1.

22. By making, using, offering for sale, and/or selling the ’816 40G Accused Instrumentalities infringing the ’816 Patent, Defendant has injured Oyster and is liable to Oyster for infringement of the ’816 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

23. In addition, Defendant actively induces others, including without limitation customers and end users of 40G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 1 of the ’816 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Defendant’s customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 1 of the ’816 Patent. Defendant has actual knowledge of the ’816 Patent at least as of service of the Complaint in this action. Defendant is knowingly inducing its customers and/or end users to directly infringe the ’816 Patent, with the specific intent to encourage such infringement, and knowing that the

⁵ *Id.*

induced acts constitute patent infringement. Defendant's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '816 Patent.

24. Further, Defendant is contributing to the infringing acts of others, such as its customers, end users, and/or service providers in selling, offering to sell or importing into the United States the 40G Accused Instrumentalities or components thereof which have been especially made or especially adapted for use. For example, according to Defendant, "Alcatel-Lucent 1625 Lambda Extreme Transport (1625 LambdaXtreme) is a next generation 10Gbps/40Gbps core transport solution from Alcatel-Lucent Technologies offering one common platform for cost effective long-haul, ultra long-haul, and ultra high-capacity optical transport"⁶ Upon information and belief, Defendant's customers, end users, and/or service providers have directly infringed and are directly infringing each and every claim limitation of claim 1 of the '816 Patent. Defendant has actual knowledge of the '816 Patent at least as of service of the Complaint in this action. Defendant is therefore a contributory infringer under 35 U.S.C. § 271(c).

25. To the extent facts learned in discovery show that Defendant's infringement of the '816 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

26. As a result of Defendant's infringement of the '816 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendant's infringement, but in no

⁶ *1625 LambdaXtreme Transport*, NOKIA, <https://networks.nokia.com/products/1625-lambdaxtreme-transport> (last visited Oct. 27, 2016). (Nokia Corporation acquired Alcatel-Lucent in 2016.)

event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

27. Unless a permanent injunction is issued enjoining Defendant and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '816 Patent, Oyster will be greatly and irreparably harmed.

COUNT II

INFRINGEMENT OF THE '952 PATENT

28. Oyster references and incorporates by reference paragraphs 1 through 28 of this Complaint.

29. On information and belief, Defendant makes, uses, offers for sale and/or sells in the United States 40G Accused Instrumentalities that infringe various claims of the '952 Patent, and continues to do so.

30. On information and belief, the 40G Accused Instrumentalities are optical data transmitters. For example, the Alcatel-Lucent Study used the Alcatel-Lucent 1626LM commercial system. For example, Alcatel-Lucent published a study ("Alcatel-Lucent Study") which used one of the 40G Accused Instrumentalities – the Alcatel-Lucent 1626LM. A previously presented figure showed that the Alcatel-Lucent 1626LM comprises a Tx PDMQPSK.⁷

⁷ Renaudier, J. et al. (2009, March). Performance comparison of 40G and 100G coherent PDM-QPSK for upgrading dispersion managed legacy systems. In *National Fiber Optic Engineers Conference* (p. NWD5). Optical Society of America.

31. On information and belief, the 40G Accused Instrumentalities comprise a laser for producing light. For example, the Alcatel-Lucent Study stated that “[t]he light from a narrow linewidth tuneable laser is sent to a QPSK modulator,” as shown previously.⁸

32. On information and belief, the 40G Accused Instrumentalities comprise a phase modulator phase modulating the light. For example, the Alcatel-Lucent Study stated that “[t]he . . . coherent PDM-QPSK signal is generated using the equipment depicted in Fig.1. The light from a narrow linewidth tuneable laser is sent to a QPSK modulator . . . which is fed by 215-1-bit-long sequences, including 7% Forward Error Correction (FEC) and protocol overhead.”⁹

33. On information and belief, the 40G Accused Instrumentalities comprise an electronic control circuit for receiving an electronic input data stream and controlling the phase-modulator, the electronic control circuit including an input data circuit having an electronic delay. For example, a DQPSK transmitter performs simultaneous transmission of two DPSK signals, with 90° phase difference between the two signals. As a result, both the transmitter and receiver designs are similar to those in DPSK systems. A DPSK transmitter used for communication comprises a feedback loop in a precoder with a time delay “T” feeding into an exclusive-or gate along with the input data stream.

34. On information and belief, the 40G Accused Instrumentalities comprise a phase compensation circuit for altering an output of the input data circuit, the phase compensation circuit including an N-bit register for storing a desired phase compensation amount, an ALU for summing without carry the desired phase compensation amount, and a delayed feedback exclusive-or gate having a gate output and receiving the input data stream as an input. For

⁸ Renaudier, J. et al. (2009, March). Performance comparison of 40G and 100G coherent PDM-QPSK for upgrading dispersion managed legacy systems. In *National Fiber Optic Engineers Conference* (p. NWD5). Optical Society of America.

⁹ *Id.*

example, a DPSK transmitter, which on information and belief is consistent with the design of the 40G Accused Instrumentalities, includes an exclusive-or gate receiving the input data stream as input and producing an output. On information and belief, a most significant bit of an ALU output of the ALU is fed together with the gate output through another exclusive-or gate.

35. On information and belief, Defendant has directly infringed and continues to directly infringe the '952 Patent by, among other things, making, using, offering for sale, and/or selling the '952 40G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the '952 Patent including at least claim 13.

36. By making, using, offering for sale, and/or selling the '952 40G Accused Instrumentalities infringing the '952 Patent, Defendant has injured Oyster and is liable to Oyster for infringement of the '952 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

37. In addition, Defendant actively induces others, including without limitation customers and end users of 40G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 13 of the '952 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Defendant's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 13 of the '952 Patent. Defendant has pre-suit knowledge of the '952 Patent as evidenced by U.S. Patent No. 6,671,077 (issued Dec. 30, 2003). The '952 Patent was cited against U.S. Patent No. 6,671,077 while it was pending before the Patent Office. The U.S. Patent No. 6,671,077 was assigned to Lucent Technologies Inc. Lucent Technologies Inc. merged with Alcatel to form Alcatel-Lucent in 2006. Subsequently, Nokia Corporation acquired Alcatel-Lucent in 2016. Thus, Defendant has

pre-suit knowledge of the '952 Patent. Defendant has actual knowledge of the '952 Patent at least as of service of the Complaint in this action. Defendant is knowingly inducing its customers and/or end users to directly infringe the '952 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Defendant's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '952 Patent.

38. To the extent facts learned in discovery show that Defendant's infringement of the '952 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

39. As a result of Defendant's infringement of the '952 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

40. Unless a permanent injunction is issued enjoining Defendant and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '952 Patent, Oyster will be greatly and irreparably harmed.

COUNT III

INFRINGEMENT OF THE '055 PATENT

41. Oyster references and incorporates by reference paragraphs 1 through 40 of this Complaint.

42. On information and belief, Defendant makes, uses, offers for sale and/or sells in the United States 40G Accused Instrumentalities that infringe various claims of the '055 Patent, and continues to do so.

43. On information and belief, the 40G Accused Instrumentalities are optical data transmitters. For example, the Alcatel-Lucent Study used the Alcatel-Lucent 1626LM commercial system. A previous figure shows that the Alcatel-Lucent 1626LM comprises a Tx PDMQPSK¹⁰

44. On information and belief, the 40G Accused Instrumentalities comprise a light source producing light. For example, the Alcatel-Lucent Study stated that “[t]he light from a narrow linewidth tuneable laser is sent to a QPSK modulator,” as shown in a previous figure.¹¹

45. On information and belief, the 40G Accused Instrumentalities comprise a phase modulator for phase modulating light from the light source. For example, the Alcatel-Lucent Study stated that “[t]he . . . coherent PDM-QPSK signal is generated using the equipment depicted in Fig.1. The light from a narrow linewidth tuneable laser is sent to a QPSK modulator . . . which is fed by 215-1-bit-long sequences, including 7% Forward Error Correction (FEC) and protocol overhead.”¹²

46. On information and belief, the 40G Accused Instrumentalities comprise a controller controlling the phase modulator. For example, Alcatel-Lucent published a study (“Alcatel-Lucent Study”) which used one of the 40G Accused Instrumentalities – the Alcatel-

¹⁰ Renaudier, J. et al. (2009, March). Performance comparison of 40G and 100G coherent PDM-QPSK for upgrading dispersion managed legacy systems. In *National Fiber Optic Engineers Conference* (p. NWD5). Optical Society of America.

¹¹ *Id.*

¹² *Id.*

Lucent 1626LM. The exemplary figures above show that the Alcatel-Lucent 1626LM is a fiber optic data transmission system.¹³

47. On information and belief, the 40G Accused Instrumentalities comprise the controller including a delayed-feedback exclusive-or gate. For example, a DQPSK transmitter performs simultaneous transmission of two DPSK signals, with 90° phase difference between the two signals. As a result, both the transmitter and receiver designs are similar to those in DPSK systems. A DPSK transmitter used for communication comprises feedback loop in the precoder with a time delay “T” feeding into an exclusive-or gate along with the input data stream.

48. On information and belief, the 40G Accused Instrumentalities comprise a controller having a controller output electronic data stream of a plurality of bits, each bit being either a binary zero or a binary one, the phase modulator creating a phase-modulated optical signal, for each bit the phase modulator imparting on the light for each binary zero of the controller output electronic data stream either a first phase corresponding to the binary zero or a second phase offset 180 degrees from the first phase corresponding to the binary one so as to create the phase-modulated optical signal. For example, in a DQPSK transmitter, one modulator provides a phase modulation of 0 and π (i.e. 0° and 180°) similar to DPSK signals. Another modulator provides a phase modulation of $\pm\pi/2$ (i.e. $\pm 90^\circ$). Thus, both modulations employ 180° phase offsets.

49. On information and belief, the 40G Accused Instrumentalities comprise a transmitter having an optical output for the phase-modulated optical signal, the phase-modulated optical signal at the optical output being free of amplitude modulation as a function of the input

¹³ Renaudier, J. et al. (2009, March). Performance comparison of 40G and 100G coherent PDM-QPSK for upgrading dispersion managed legacy systems. In *National Fiber Optic Engineers Conference* (p. NWD5). Optical Society of America.

electronic data stream. For example, the DQPSK transmitter used for communications is representative and is exemplary of the type of transmitter that, on information and belief, is used in the 40G Accused Instrumentalities. On information and belief, the transmitter comprises an encoder encoding an input data stream and then controlling the phase modulator accordingly to phase modulate the light. On information and belief, the transmitter comprises phase modulators which are used to modulate optical signal in the 40G Accused Instrumentalities. On information and belief, 40G Accused Instrumentalities comprise an input data stream entering an exclusive-or function, which requires a binary/digital input. On information and belief, the modulated signal is free of amplitude modulation, consistent with both the '055 Patent and the 40G Accused Instrumentalities that, on information and belief, utilized transmitter and controller designs similar to those described herein.

50. On information and belief, Defendant has directly infringed and continues to directly infringe the '055 Patent by, among other things, making, using, offering for sale, and/or selling the '055 40G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the '055 Patent's including at least claim 15.

51. By making, using, offering for sale, and/or selling the 40G Accused Instrumentalities infringing the '055 Patent, Defendant has injured Oyster and is liable to Oyster for infringement of the '055 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

52. In addition, Defendant is actively inducing others, such as its customers and end users of 40G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 15 of the '055 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief,

Defendant's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 15 of the '055 Patent. Defendant has pre-suit knowledge of the '055 Patent as evidenced by U.S. Patent No. 6,798,557 (issued Sep. 28, 2004). The '055 Patent was cited against U.S. Patent No. 6,798,557 while it was pending before the Patent Office. The U.S. Patent No. 6,798,557 was assigned to Lucent Technologies Inc. Lucent Technologies Inc. merged with Alcatel to form Alcatel-Lucent in 2006. Subsequently, Nokia Corporation acquired Alcatel-Lucent in 2016. Thus, Defendant has pre-suit knowledge of the '055. Further, Defendant has actual knowledge of the '055 Patent at least as of service of the Complaint in this action. Defendant is knowingly inducing its customers and/or end users to directly infringe the '055 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Defendant's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '055 Patent.

53. To the extent facts learned in discovery show that Defendant's infringement of the '055 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

54. As a result of Defendant's infringement of the '055 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

55. Unless a permanent injunction is issued enjoining Defendant and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '055 Patent, Oyster will be greatly and irreparably harmed.

COUNT IV

INFRINGEMENT OF THE '592 PATENT

56. Oyster references and incorporates by reference paragraphs 1 through 55 of this Complaint.

57. On information and belief, Defendant makes, uses, offers for sale and/or sells in the United States 40G Accused Instrumentalities that infringe various claims of the '592 Patent, and continues to do so.

58. On information and belief, the 40G Accused Instrumentalities comprise a card for transmitting data over at least one optical fiber. For example, “[t]he Nokia 1830 PSS family presents a combination of WDM photonic switching and ODU electronic switching layers, scalable product size variants from access (PSS-4) to core (PSS-64), interchangeable line cards among shelves, cross-layer capabilities, and a common network management system for photonic DWDM functions and OTN functions.”¹⁴

59. On information and belief, the 40G Accused Instrumentalities comprise a transmitter having at least one light source. For example, the Alcatel-Lucent Study used the Alcatel-Lucent 1626LM commercial system. A previous figure shows that the Alcatel-Lucent

¹⁴ *1830 Photonic Service Switch*, NOKIA, <https://networks.nokia.com/products/1830-photonic-service-switch> (last visited Oct. 27, 2016). (Nokia Corporation acquired Alcatel-Lucent in 2016.)

1626LM comprises a Tx PDMQPSK.¹⁵ Further, the Alcatel-Lucent Study stated that “[t]he light from a narrow linewidth tuneable laser is sent to a QPSK modulator,” as shown in a previous figure.¹⁶

60. On information and belief, the 40G Accused Instrumentalities comprise a phase modulator for phase modulating light from the source so as to create phase-modulated optical signals in the light as a function of an input electronic data stream. For example, the Alcatel-Lucent Study stated that “[t]he . . . coherent PDM-QPSK signal is generated using the equipment depicted in Fig.1. The light from a narrow linewidth tuneable laser is sent to a QPSK modulator . . . which is fed by 215-1-bit-long sequences, including 7% Forward Error Correction (FEC) and protocol overhead.”¹⁷

61. On information and belief, the 40G Accused Instrumentalities comprise a receiver having an interferometer for reading received optical signals, the interferometer having a delay loop fiber. For example, a receiver in the above system has interferometers, each with a path difference between its two arms of time “T”. This path length difference has one arm of each interferometer longer than the other.

62. On information and belief, the 40G Accused Instrumentalities comprise a fastening device for securing the delay loop fiber. For example, the interferometer device for the 40G Accused Instrumentalities are, on information and belief, packaged in an industry standard module. The module, on information and belief, must be fastened and soldered to a circuit board

¹⁵ Renaudier, J. et al. (2009, March). Performance comparison of 40G and 100G coherent PDM-QPSK for upgrading dispersion managed legacy systems. In *National Fiber Optic Engineers Conference* (p. NWD5). Optical Society of America.

¹⁶ *Id.*

¹⁷ *Id.*

for operation and inside the module the subcomponents, including the delay, must be secured to the package or package substrate.

63. On information and belief, Defendant have directly infringed and continue to directly infringe the '592 Patent by, among other things, making, using, offering for sale, and/or selling the 40G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the '592 Patent's including at least claim 1.

64. By making, using, offering for sale, and/or selling the 40G Accused Instrumentalities infringing the '592 Patent, Defendant has injured Oyster and is liable to Oyster for infringement of the '592 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

65. In addition, Defendant is actively inducing others, such as its customers and end users of 40G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 1 of the '592 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Defendant's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 1 of the '592 Patent. Defendant has actual knowledge of the '592 Patent at least as of service of the Complaint in this action. Defendant is knowingly inducing its customers and/or end users to directly infringe the '592 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Defendant's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '592 Patent.

66. To the extent facts learned in discovery show that Defendant's infringement of the '592 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

67. As a result of Defendant's infringement of the '592 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

68. Unless a permanent injunction is issued enjoining Defendant and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '592 Patent, Oyster will be greatly and irreparably harmed.

COUNT V

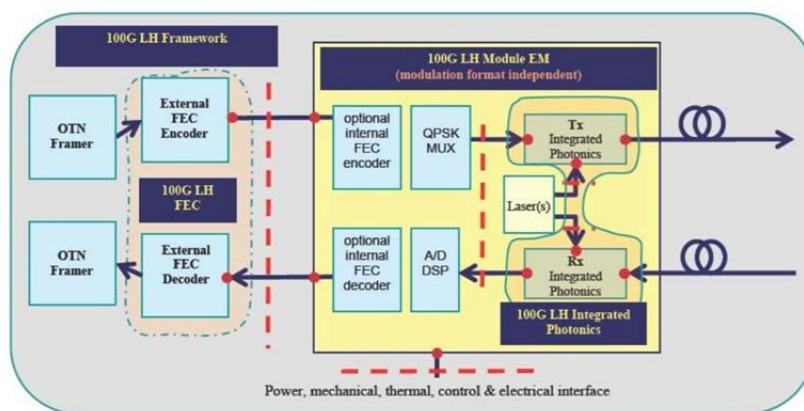
INFRINGEMENT OF THE '327 PATENT

69. Oyster references and incorporates by reference paragraphs 1 through 68 of this Complaint.

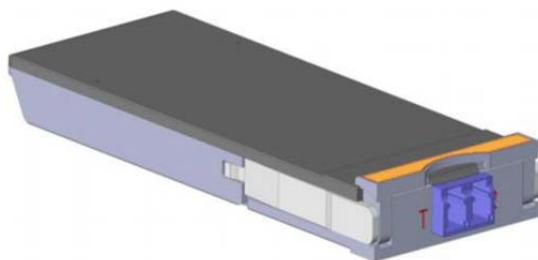
70. On information and belief, Defendant makes, uses, offers for sale and/or sells in the United States the Accused Instrumentalities that infringe various claims of the '327 Patent, and continues to do so. These products include, for example, Nokia's platforms, their compatible modules, devices, and components such as the 1830 Photonic Service Switch, 1620 Light Manager, 1625 LambdaXtreme Transport, and 1626 Light Manager.¹⁸ The exemplary infringing products shall be referred to hereinafter as the "100G Accused Instrumentalities."

¹⁸ See, e.g., *Portfolio - Optical Networking*, NOKIA, [https://networks.nokia.com/portfolio-explorer?f\[0\]=field_facet_function%3A8786](https://networks.nokia.com/portfolio-explorer?f[0]=field_facet_function%3A8786) (last visited Oct. 27, 2016); *1830 Photonic Service Switch*, NOKIA, <https://networks.nokia.com/products/1830-photonic-service-switch> (last visited

71. On information and belief, the 100G Accused Instrumentalities comprise a transceiver card for a telecommunications box for transmitting data over a first optical fiber and receiving data over a second optical fiber. The 100G Accused Instrumentalities, on information and belief, are designed in accordance with Optical Internetworking Forum (“OIF”) specifications. The implementation of an exemplary OIF standardized DP-QPSK transceiver for sending and receiving data over optical fibers is depicted below. The blocks shown below are printed on a single circuit board or card.

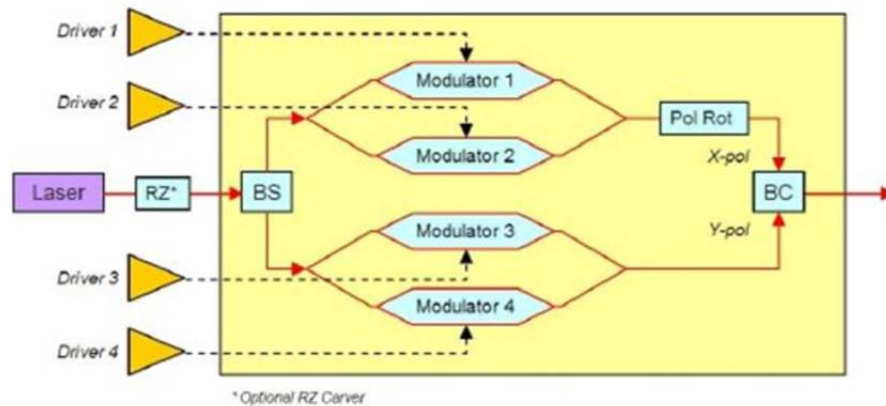


The figure below depicts a product designed in accordance with the OIF CFP2 ACO standard, which shows a module or card that is implemented in a telecommunications box or system.



Oct. 27, 2016); *1620 Light Manager*, NOKIA, <https://networks.nokia.com/products/1620-light-manager> (last visited Oct. 27, 2016); *1625 LambdaXtreme Transport*, NOKIA, <https://networks.nokia.com/products/1625-lambdaxtreme-transport> (last visited Oct. 27, 2016); and *1626 LIGHT MANAGER*, NOKIA, <https://networks.nokia.com/products/1626-light-manager> (last visited Oct. 27, 2016). (Nokia Corporation acquired Alcatel-Lucent in 2016.)

72. On information and belief, the 100G Accused Instrumentalities comprise a transmitter for transmitting data over the first optical fiber, the transmitter having a laser, a modulator, and a controller receiving input data and controlling the modulator as a function of the input data, the transmitter transmitting optical signals for telecommunication as a function of the input data. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G standard comprise a laser and a modulator. As shown in the figure below, OIF 100G Standard devices employ lasers and modulators.



As shown in the figure below, the 100G Accused Instrumentalities designed in accordance with the OIF CFP2 ACO Standard contain a transmitter (Tx Coherent Optics) with a laser, a modulator, and a driver which is configured to receive input data and control the modulator to generate a first optical signal as a function of the input data.

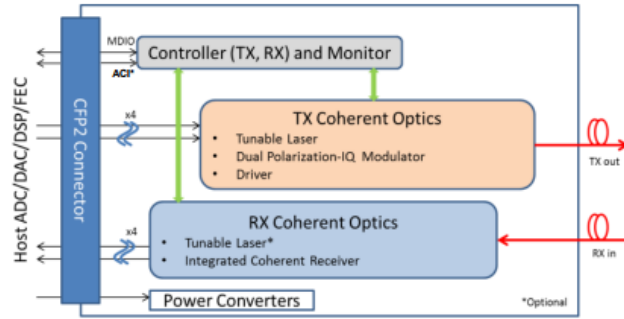


Figure 2 CFP2-ACO Module High Level Block Diagram

The figure below depicts an exemplary controller consistent with the OIF CPA2 ACO Standard, and, on information and belief, utilized by the 100G Accused Instrumentalities that is configured to receive input data and control the modulator to generate a first optical signal as a function of the input data.

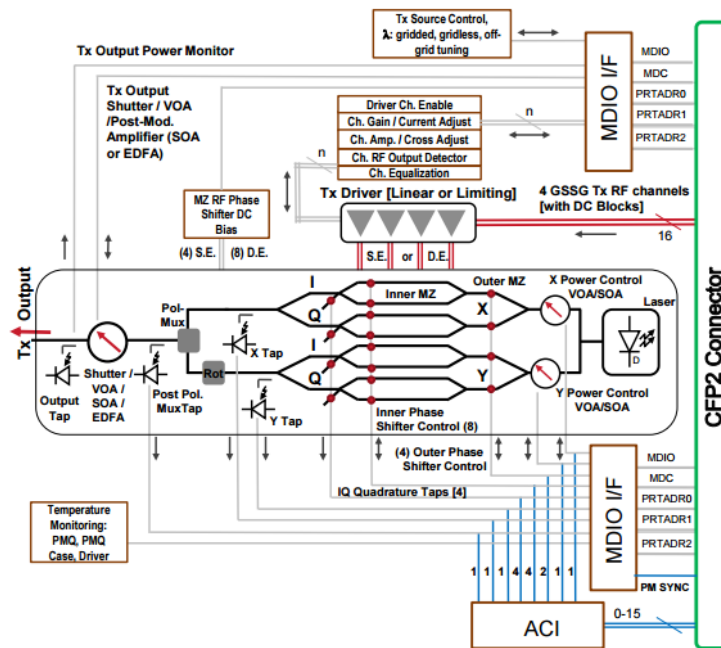


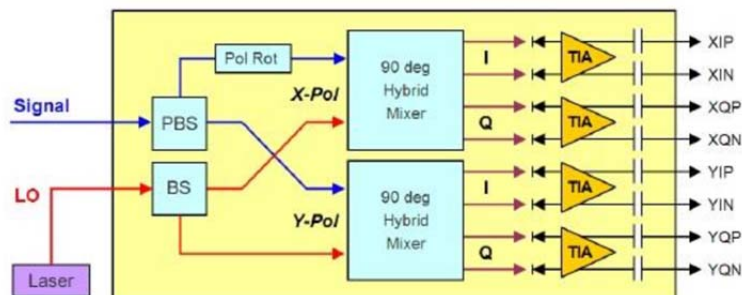
Figure 4: Superset Transmit Function Block Diagram with an MDIO plus Full Superset Analog Control Interface (ACI)

73. On information and belief, the 100G Accused Instrumentalities comprise a fiber output optically connected to the laser for connecting the first optical fiber to the card. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G

Standard utilize a laser's optical output as connected through "Tx Integrated Photonics" and an output to reach the optical transmission fiber, as depicted in a previous figure. A first optical fiber is also depicted in a figure shown above at the "Tx out" of the exemplary OIF CFP2 ACO Standardized module.

74. On information and belief, the 100G Accused Instrumentalities comprise a fiber input for connecting the second optical fiber to the card. The exemplary figure above depicts a fiber receiving the data going into the transceiver card.

75. On information and belief, the 100G Accused Instrumentalities comprise a receiver optically connected to the fiber input for receiving data from the second optical fiber. For example, the figure below depicts the receiver module that receives the optical signal from the receiver fiber at "Signal." For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard utilize a receiver module, which receives the optical signal from the receiver fiber at "Signal," as depicted in the figure below.



A receiver is also depicted in the figure below, between the RX Coherent optics block at the CFP2 Connector. The figure below, which further describes a module designed in accordance with the OIF CPD2 ACO Standard, also depicts a receiver.

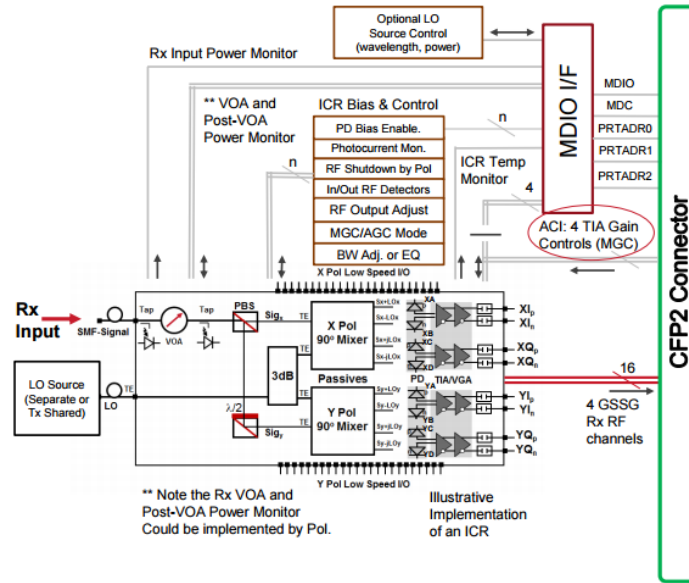
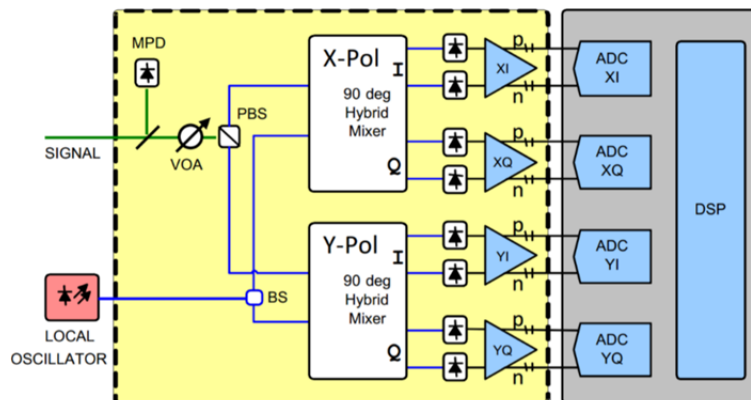


Figure 6: Superset Receive Function Block Diagram with an MDIO plus Full Superset Analog Control Interface (ACI)

76. On information and belief, the 100G Accused Instrumentalities comprise an energy level detector optically connected between the receiver and the fiber input to measure an energy level of the optical signals, wherein the energy level detector includes a plurality of thresholds. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard contain an energy level detector (power tap or monitor photodetector (“MPD”)), as the OIF 100G Standard specifies an integrated receiver module whose functional diagram is shown in the figure below.



One of the basic requirements for the coherent receiver is an optical power tap or monitor photodiode (“MPD”) in the signal input path. This MPD provides a representation of the optical signal strength in the form of an electrical signal. The electrical signal is measured, and provides an indication of the energy level of the optical signal. Table 1 specifies the opto-electrical properties of the receiver. The average optical power of the operating signal has minimum, typical and maximum threshold values.

Table 1**Table 7: Opto-electrical properties**

Parameter	Units	Min	Typ	Max	Comments
Symbol Rate	GBaud			32	
Operating Signal Power	dBm	-18	-10	0	Average optical power
Local Oscillator Power	dBm				See Figure 5 for recommended operating conditions.
Linear output swing adjustment range					Peak to peak, differential, AC coupled
Standard	mVppd	300	500	700	
Extended	mVppd	400		900	

The defined parameters (e.g., current, average, minimum, and maximum) for the receiver input power are as depicted in Table 2 below.

Table 2

Rx Total Optical Power Monitoring [13.3 Provides Existing MIS Rx Input Power Monitoring Registers]						
B4E0 [2.0] [000]	1	RO	15~0	Current Input Power [Total Rx Optical]	A signed 16-bit integer with the LSB = 0.01dBm. [2.6 commentary: Preferred Register for CFP2-ACO Total Current Rx Input Power.]	
B4F0 [2.0] [000]	1	RO	15~0	Average Input Power over PM interval [Total Rx Optical]	A signed 16-bit integer with the LSB = 0.01dBm. [2.6 commentary: Preferred Register for CFP2-ACO Average Total Current Rx Input Power.]	
B500 [2.0] [000]	1	RO	15~0	Minimum Input Power over PM interval [Total Rx Optical]	A signed 16-bit integer with the LSB = 0.01dBm. [2.6 commentary: Preferred Register for CFP2-ACO Minimum Total Current Rx Input Power.]	
B510 [2.0] [000]	1	RO	15~0	Maximum Input Power over PM interval [Total Rx Optical]	A signed 16-bit integer with the LSB = 0.01dBm. [2.6 commentary: Preferred Register for CFP2-ACO Maximum Total Current Rx Input Power.]	

Tables 1 and 2 above specify the opto-electrical properties of the receiver. The average optical power of the operating signal has minimum, typical and maximum threshold values.

77. On information and belief, Defendant has directly infringed and continues to directly infringe the '327 Patent by, among other things, making, using, offering for sale, and/or selling the 100G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the '327 Patent including at least claim 1.

78. By making, using, offering for sale, and/or selling the 100G Accused Instrumentalities infringing the '327 Patent, Defendant has injured Oyster and is liable to Oyster for infringement of the '327 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

79. In addition, Defendant actively induces others, including without limitation customers and end users of 100G Accused Instrumentalities, to directly infringe each and every claim limitation, including without limitation claim 1 of the '327 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Defendant's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 1 of the '327 Patent. Defendant has actual knowledge of the '327 Patent at least as of service of the Complaint in this action. Defendant is knowingly inducing its customers and/or end users to directly infringe the '327 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Defendant's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '327 Patent.

80. To the extent facts learned in discovery show that Defendant's infringement of the '327 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

81. As a result of Defendant's infringement of the '327 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

82. Unless a permanent injunction is issued enjoining Defendant and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '327 Patent, Oyster will be greatly and irreparably harmed.

COUNT VI

INFRINGEMENT OF THE '511 PATENT

83. Oyster references and incorporates by reference paragraphs 1 through 82 of this Complaint.

84. On information and belief, Defendant makes, uses, offers for sale and/or sells in the United States the 100G Accused Instrumentalities that infringe various claims of the '511 Patent, and continues to do so.

85. On information and belief, the 100G Accused Instrumentalities practice a method for operating an optical fiber multiplexor in a phase modulation mode. The '511 Accused Instrumentalities, on information and belief, are designed in accordance with the OIF 100G Standard specifying DP-QPSK as the modulation format for 100G. On information and belief, the 100G Accused Instrumentalities are also designed in accordance with the OIF CFP2 ACO

Standard. A previous figure illustrates the implementation of an exemplary OIF standardized DP-QPSK transceiver for sending and receiving data over optical fibers. The blocks depicted in a previous figure are typically printed on a single circuit board or card used in optical fiber multiplexor systems. A previous figure depicts a product designed in accordance with the OIF CFP2 ACO standard, which shows a module or card that is implemented in optical fiber multiplexor systems.

86. On information and belief, the 100G Accused Instrumentalities perform the step of feeding input data to a controller of a transmitter of a telecommunications box, the telecommunications box having an electronic data input for the input data and an electronic data output. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G standard comprise a laser and a modulator. As shown above, OIF 100G Standard devices employ lasers and modulators. The signal passes to the transceiver module. Data is converted to drive signals to control the optical modulators. A transmit laser provides the light source for the modulators. On the receive side the incoming signal is mixed with a local oscillator, demodulated into components, detected, amplified, digitized, then passed into the DSP module.

87. On information and belief, the 100G Accused Instrumentalities perform the step of using the controller, controlling a modulator to phase modulate light from a laser as a function of the input data. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard utilized a transceiver where data is converted to drive signals to control the optical modulators, as previously shown.

88. On information and belief, the 100G Accused Instrumentalities perform the step of sending the modulated light as an optical signal from the transmitter over an optical fiber. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G

transmit a phase modulated optical signal over an optical fiber, as previously shown. An exemplary fiber input optically connected to the receiver and configured to optically connect the second optical fiber to the transceiver card is also depicted in a previous figure at the “Rx in” of the exemplary OIF-CFP2-ACO Standardized module, and at the connection between the RX Coherent Optics block and the CFP2 Connector.

89. On information and belief, the 100G Accused Instrumentalities perform the step of receiving the optical signals from the optical fiber at a receiver of a further telecommunications box and converting the optical signals to electronic output data. For example, on information and belief the 100G Accused Instrumentalities designed in accordance with the OIF-DPC-RX Standard utilize an integrated receiver module as previously shown.

90. On information and belief, the 100G Accused Instrumentalities perform the step of passing the phase-modulated optical signals to a photodetector to produce an electric signal. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G and OIF-DPC-RX Standards utilize a monitoring photodiode (MPD) that taps and receives the phase-modulated incoming optical signal and produces an electrical signal in response, as previously shown.

91. On information and belief, the 100G Accused Instrumentalities perform the step of filtering the electrical signal to produce an average optical power. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard contain an energy level detector (power tap or monitor photodiode (MPD)), as the OIF 100G Standard specifies an integrated receiver module whose functional diagram is shown in a previous figure. One of the basic requirements for the coherent receiver is an optical power tap or MPD in the signal input path. Table 1 specifies the opto-electrical properties of the receiver. The average optical power

of the operating signal has minimum, typical and maximum threshold values. The OIF CFP2 ACO Standard also requires an Intradyne Coherent Receiver optical power monitoring functionality, as depicted in Table 2.

92. On information and belief, Defendant has directly infringed and continues to directly infringe the '511 Patent by, among other things, making, using, offering for sale, and/or selling the 100G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the '511 Patent including at least claim 9.

93. By making, using, offering for sale, and/or selling the 100G Accused Instrumentalities infringing the '511 Patent, Defendant has injured Oyster and is liable to Oyster for infringement of the '511 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

94. In addition, Defendant is actively inducing others, such as its customers and end users of 100G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 9 of the '511 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Defendant's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 9 of the '511 Patent. Defendant has actual knowledge of the '511 Patent at least as of service of the Complaint in this action. Defendant is knowingly inducing its customers and/or end users to directly infringe the '511 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Defendant's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications,

installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '511 Patent.

95. To the extent facts learned in discovery show that Defendant's infringement of the '511 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

96. As a result of Defendant's infringement of the '511 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

97. Unless a permanent injunction is issued enjoining Defendant and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '511 Patent, Oyster will be greatly and irreparably harmed.

COUNT VII

INFRINGEMENT OF THE '898 PATENT

98. Oyster references and incorporates by reference paragraphs 1 through 97 of this Complaint.

99. On information and belief, Defendant makes, uses, offers for sale and/or sells in the United States the 100G Accused Instrumentalities that infringe various claims of the '898 Patent, and continues to do so.

100. On information and belief, the 100G Accused Instrumentalities are a transceiver card for a telecommunications box for transmitting data over a first optical fiber and receiving data over a second optical fiber. The 100G Accused Instrumentalities, on information and belief,

are designed in accordance with OIF 100G Standard. OIF has focused on DP-QPSK as the modulation format for 100G. On information and belief, the 100G Accused Instrumentalities are also designed in accordance with the OIF CFP2 ACO Standard. A previous figure illustrates the implementation of an exemplary OIF standardized DP-QPSK transceiver for sending and receiving data over optical fibers. The blocks depicted previously are typically printed on a single circuit board or card. The exemplary figures above depict a product designed in accordance with the OIF CFP2 ACO standard, which shows a module or card that is implemented in a telecommunications box or system.

101. On information and belief, the 100G Accused Instrumentalities comprise a transmitter having a laser, a modulator, and a controller configured to receive input data and control the modulator to generate a first optical signal as a function of the input data. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G standard comprise a laser and a modulator. As previously shown, OIF 100G Standard devices employ lasers and modulators. As previously shown, the Accused Instrumentalities designed in accordance with the OIF CFP2 ACO Standard contain a transmitter (Tx Coherent Optics) with a laser, a modulator, and a driver which is configured to receive input data and control the modulator to generate a first optical signal as a function of the input data. The exemplary figures above depict an exemplary controller consistent with the OIF CPA2 ACO Standard, and, on information and belief utilized by the 100G Accused Instrumentalities, that is configured to receive input data and control the modulator to generate a first optical signal as a function of the input data.

102. On information and belief, the 100G Accused Instrumentalities comprise a fiber output optically connected to the transmitter and configured to optically connect the first optical

fiber to the transceiver card. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard utilize a laser's optical output as connected through the "Tx Integrated Photonics" depicted in a previous figure. Also depicted above is an output to reach the optical transmission fiber. A first optical fiber is also depicted above at the "Tx out" of the exemplary OIF CFP2 ACO Standardized module.

103. On information and belief, the 100G Accused Instrumentalities comprise a receiver configured to receive a second optical signal from the second optical fiber and to convert the second optical signal to output data. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard utilize a receiver module depicted in a previous figure that receives the optical signal from the receiver fiber at "Signal." A receiver is also depicted in a figure shown previously, between the RX Coherent optics block at the CFP2 Connector. A previous figure, which further describes a module designed in accordance with the OIF CPD2 ACO Standard, also depicts a receiver.

104. On information and belief, the 100G Accused Instrumentalities comprise a fiber input optically connected to the receiver and configured to optically connect the second optical fiber to the transceiver card. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard connect the laser's optical output through the "Rx Integrated Photonics", and also specify an output to reach the optical transmission fiber, as depicted in a previous figure. An exemplary fiber input optically connected to the receiver and configured to optically connect the second optical fiber to the transceiver card is also depicted in a figure shown previously at the "Rx in" of the exemplary OIF CFP2 ACO Standardized module, and at the connection between the RX Coherent Optics block and the CFP2 Connector.

105. On information and belief, the 100G Accused Instrumentalities comprise an energy level detector optically connected between the receiver and the fiber input to measure an energy level of the second optical signal, wherein the energy level detector includes a plurality of thresholds. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard and, for example, the OIF DPC RX Standard, contain an energy level detector depicted by the monitoring photodiode (“MPD”). The OIF 100G and OIF DPC RX Standards specify an integrated receiver module whose functional diagram is shown in a previous figure. One of the basic requirements for the coherent receiver is an optical power tap (monitor photodiode or “MPD”) in the signal input path. This MPD provides a representation of the optical signal strength in the form of an electrical signal. The electrical signal is measured, and provides an indication of the energy level of the optical signal. Table 1 specifies the opto-electrical properties of the receiver. The average optical power of the operating signal has minimum, typical and maximum threshold values. The OIF CFP2 ACO Standard also requires an Intradyme Coherent Receiver optical power monitoring functionality, (Rx Input Power Monitor) as shown in a previous figure. The defined parameters (e.g., current, average, minimum, and maximum) for the receiver input power are as depicted in Table 2.

106. On information and belief, Defendant has directly infringed and continues to directly infringe the ’898 Patent by, among other things, making, using, offering for sale, and/or selling the 100G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the ’898 Patent including at least claim 1.

107. By making, using, offering for sale, and/or selling the 100G Accused Instrumentalities infringing the ’898 Patent, Defendant has injured Oyster and is liable to Oyster

for infringement of the '898 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

108. In addition, Defendant is actively inducing others, such as its customers and end users of 100G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 1 of the '898 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Defendant's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 1 of the '898 Patent. Defendant has actual knowledge of the '898 Patent at least as of service of the Complaint in this action. Defendant is knowingly inducing its customers and/or end users to directly infringe the '898 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Defendant's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '898 Patent.

109. To the extent facts learned in discovery show that Defendant's infringement of the '898 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

110. As a result of Defendant's infringement of the '898 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

111. Unless a permanent injunction is issued enjoining Defendant and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '898 Patent, Oyster will be greatly and irreparably harmed.

COUNT VIII

INFRINGEMENT OF THE '012 PATENT

112. Oyster references and incorporates by reference paragraphs 1 through 111 of this Complaint.

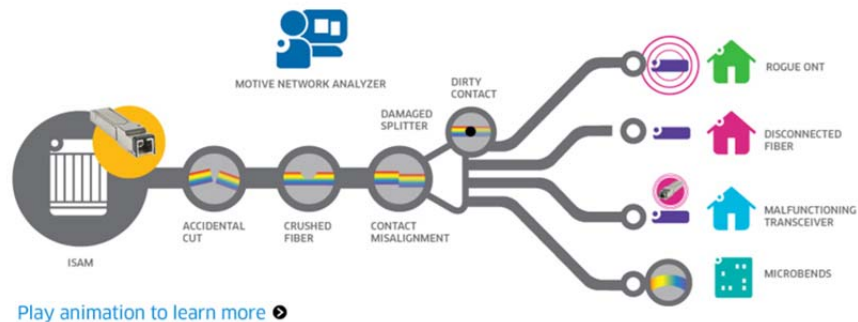
113. On information and belief, Defendant makes, uses, offers for sale and/or sells in the United States products that infringe various claims of the '012 Patent, including without limitation the 7302, 7330 FTTN, and 7360 integrated Service Access Manager ("ISAM") systems (hereinafter, "eOTDR Accused Instrumentalities"), and continues to do so.

114. The eOTDR Accused Instrumentalities comprise a telecommunications monitoring method. For example, an Alcatel-Lucent Application Note describes how its "unique and innovative Embedded OTDR capabilities into its existing fiber management solution" create a "comprehensive network view and troubleshooting of fiber networks in an easy, fast and cost-effective way. By integrating OTDR functionality into its PON system and Network Analyzer - Fiber, Alcatel-Lucent has the most advanced Fiber *monitoring* tool on the market today."¹⁹

115. The eOTDR Accused Instrumentalities receive an incoming optical signal at a downstream termination point, located within an optical multiplexor box, of an optical fiber.

¹⁹ Troubleshooting at the Speed of Light – Embedded OTDR for Operational Excellence in Passive Optical Networks, at p. 1.

The Figure below depicts the receipt of an incoming optical signal at a downstream termination point (“access node”) in an exemplary Passive Optical Network (“PON”).²⁰



The structure depicted as “ISAM” is an “Intelligent Services Access Manager,” which is capable of managing fiber-to-node.²¹ As shown below, it is a multiplexor box.²²



116. On information and belief, the eOTDR Accused Instrumentalities split, within the optical multiplexor box, the incoming optical signal into a data optical signal and a test optical signal. On information and belief, a combined signal carrying both data and reflections of a continuously operating embedded OTDR signal must be split in order to analyze the OTDR information while, for example, preserving the ability to process data in the incoming signal.

²⁰ <http://www3.alcatel-lucent.com/otdr/>; See also <https://insight.nokia.com/embedded-otdr-troubleshooting-speed-light> (animation).

²¹ See, e.g., ALu 7302 et al user guide.pdf at 1-2.

²² <https://networks.nokia.com/products/7360-isam-fx-shelf> (Nokia Corporation acquired Alcatel-Lucent in 2016.)

117. On information and belief, the eOTDR Accused Instrumentalities tap the data optical signal to produce a tapped optical signal. For example, in performing embedded OTDR, the infringing products inject a pulse on top of the data signal. “In this case, rather than ‘listening’ to the reflections from a single pulse as in conventional OTDR, one can imagine listening to the reflections from a binary pulse pattern that is added on top of the normal PON downstream traffic.”²³ On information and belief, the eOTDR Accused Instrumentalities must tap the incoming data signal in order to determine measure the signal power of the data signal vis-à-vis a combined signal that includes OTDR reflections.

118. On information and belief, the multiplexor box processes the data optical signal to produce a data electrical signal indicative of data encoded in the incoming optical signal. Such a step would be essential to optical telecommunications, and the eOTDR Accused Instrumentalities support a variety of Line Termination (“LT”) and Network Termination (“NT”) boards for various data telecommunications networks such as ADSL, Ethernet, and VDSL.²⁴ Transmission on these exemplary network types occurs via electrical signal, and the provision of service to and from subscribers using such connections requires the production of data electrical signals indicative of data encoded in incoming optical signals. For example, “Very high bit rate Digital Subscriber Line (VDSL) allows very high speed data transmission on a metallic twisted pair between the operator network and the customer premises.”²⁵ Provisioning such networks requires, on information and belief, the ability to produce a data electrical signal indicative of data encoded in the incoming optical signal.

²³ Troubleshooting at the Speed of Light – Embedded OTDR for Operational Excellence in Passive Optical Networks, at pp. 4-5.

²⁴ ALu 7302 et al user guide.pdf at p. 2-4.

²⁵ ALu 7302 et al user guide.pdf at p. 2-9.

119. On information and belief, the eOTDR Accused Instrumentalities, for the reasons discussed in Paragraph 117, process the tapped optical signal to produce an electrical signal indicative of a power of the data optical signal.

120. The eOTDR Accused Instrumentalities perform, using a OTDR within the multiplexor box, OTDR monitoring of an optical fiber. For example, “An OTDR measurement provides a view of the signal attenuation characteristics of the fiber, splices, connectors, splitters, and highly reflective network components. Typical reflective components are SC/PC connectors, splitters and most types of fiber cuts ... The embedded OTDR solution instead adds a binary test pattern on top of the normal PON downstream traffic ... so that the OTDR measurement can be done in-service and at the same wavelength as the GPON downstream transmission. The backscattered and reflected signals are detected using a highly sensitive receiver. Recognizing the injected test pattern, the signals reflected from the fiber link can then be transformed to produce the same reflection information that is obtained from conventional pulse-based OTDR. The modulation index of the OTDR signal is sufficiently small to minimize any negative impact on the data traffic.”²⁶ “The backscattered and reflected signals are detected using a highly sensitive receiver. Recognizing the injected test pattern, the signals reflected from the fiber link can then be transformed to produce the same reflection information that is obtained from conventional pulse-based OTDR. The modulation index of the OTDR signal is sufficiently small to minimize any negative impact on the data traffic.”²⁷ The eOTDR Accused Products employ OTDR embedded into the transceivers themselves, which reside within the multiplexor box. For example, “[OTDR f]unctionality embedded in optical transmission components (Small Form

²⁶ Troubleshooting at the Speed of Light – Embedded OTDR for Operational Excellence in Passive Optical Networks, at p. 5.

²⁷ *Id.*

Factor Pluggable transceiver SFPs) in the Alcatel-Lucent ISAM access node, responsible for transmitting a continuous signal in the downstream direction and receiving its reflection.”²⁸

121. On information and belief, Defendant has directly infringed and continues to directly infringe the '012 Patent by, among other things, making, using, offering for sale, and/or selling the eOTDR Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the '012 Patent including at least claim 1.

122. By making, using, offering for sale, and/or selling the eOTDR Accused Instrumentalities infringing the '012 Patent, Defendant has injured Oyster and is liable to Oyster for infringement of the '012 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

123. In addition, Defendant is actively inducing others, such as its customers and end users of eOTDR Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 1 of the '012 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Defendant's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 1 of the '012 Patent. Defendant has actual knowledge of the '012 Patent at least as of service of this Amended Complaint. Defendant is knowingly inducing its customers and/or end users to directly infringe the '012 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Defendant's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware

²⁸ *Id.* at p. 3.

specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '012 Patent.

124. To the extent facts learned in discovery show that Defendant's infringement of the '898 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

125. As a result of Defendant's infringement of the '012 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

126. Unless a permanent injunction is issued enjoining Defendant and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '012 Patent, Oyster will be greatly and irreparably harmed.

PRAYER FOR RELIEF

Plaintiff respectfully requests the following relief from this Court:

A. A judgment that Defendant has infringed one or more claims of the '816, '952, '055, '592, '327, '511, '898 and/or '012 Patents;

B. A permanent injunction enjoining Defendant and its officers, directors, agents, affiliates, employees, divisions, branches, subsidiaries, parents, and all others acting in active concert or participation with Defendant, from infringing the '816, '952, '055, '592, '327, '511, '898 and/or '012 Patents;

C. A judgment and order requiring Defendant to pay Oyster its damages, costs, expenses, and prejudgment and post-judgment interest for Defendant's acts of infringement in

accordance with 35 U.S.C. § 284;

D. A judgment and order requiring Defendant to provide accountings and to pay supplemental damages to Oyster, including, without limitation, prejudgment and post-judgment interest;

E. A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Oyster its reasonable attorneys' fees against Defendant; and

F. Any and all other relief to which Oyster may show itself to be entitled.

JURY TRIAL DEMANDED

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Oyster requests a trial by jury of any issues so triable by right.

Dated: February 10, 2017

Respectfully submitted,

/s/ Marc A. Fenster w/permission

Andrea L. Fair

Marc Fenster (CA SB No. 181067)

Reza Mirzaie (CA SB No. 246953)

Jeffrey Liao (CA SB No. 288994)

Arka D. Chatterjee (CA SB No. 268546)

RUSS AUGUST & KABAT

12424 Wilshire Boulevard 12th Floor

Los Angeles, California 90025

Telephone: 310-826-7474

Facsimile: 310-826-6991

E-mail: mfenster@raklaw.com

E-mail: rmirzaie@raklaw.com

E-mail: jliao@raklaw.com

E-mail: a chatterjee@raklaw.com

Claire Abernathy Henry

State Bar No. 24053063

T. John Ward, Jr.

State Bar No. 00794818

Andrea L. Fair

State Bar No. 24078488

WARD, SMITH & HILL PLLC

P. O. Box 1231

Longview, Texas 75606

(903) 757-6400 (phone)

(903) 757-2323 (facsimile)

Email: Claire@wsfirm.com

E-mail: jw@wsfirm.com

E-mail: andrea@wsfirm.com

Attorneys for Plaintiff,

Oyster Optics LLC

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing document was filed electronically in compliance with Local Rule CV-5(a). Therefore, this document was served on all counsel who are deemed to have consented to electronic service. Local Rule CV-5(a)(3)(A). Pursuant to Fed. R. Civ. P. 5(d) and Local Rule CV-5(d) and (e), all other counsel of record not deemed to have consented to electronic service were served with a true and correct copy of the foregoing by email on this the 10th day of February, 2017.

/s/ Andrea L. Fair
Andrea L. Fair