

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

CEREBRUM SENSOR TECHNOLOGIES,)	)	
INC. and TIRE STICKERS LLC,)	)	
	)	
Plaintiffs,)	)	
	)	
v.)	)	Civil Action No. 24-245-JLH-SRF
	)	
REVVO TECHNOLOGIES, INC.,)	)	(CONSOLIDATED)
	)	
Defendant.)	)	

REPORT AND RECOMMENDATION

Pending before the court is the parties’ claim construction dispute regarding the term “global positioning device,” which appears in two asserted patents: United States Patent Nos. 12,344,051 (“the ’051 patent”) and 11,835,421 (“the ’421 patent”). (D.I. 195; D.I. 196) The ’051 and ’421 patents disclose a tire sensor system designed to attach to the inner surface of a vehicle tire to monitor and report conditions such as tire location, tire wear, tread depth, and/or alignment. (D.I. 210, Exs. A-B) Following a review of the parties’ joint claim construction brief and associated materials (D.I. 209; D.I. 210), I recommend that the court construe the term “global positioning device” as “a device that provides a global position of latitude, longitude, and altitude, such as through GPS technology,” consistent with Defendant’s proposed construction.

I. BACKGROUND

Plaintiffs Cerebrum Sensor Technologies, Inc. and Tire Stickers LLC (collectively, “Plaintiffs”) brought this suit on February 23, 2024, alleging infringement of the ’421 patent and U.S. Patent Nos. 10,137,741 and 11,124,027 by Defendant Revvo Technologies, Inc.’s (“Defendant”) tire sensor and wheel sensor products. (D.I. 1 at ¶¶ 1-2, 25-26) On July 31, 2025, Plaintiffs brought another action against Defendant to assert infringement of the ’051 patent by

Defendant's tire sensor products. (C.A. No. 25-962-JLH-SRF, D.I. 1 at ¶ 17) On April 29, 2026, the two civil actions were consolidated, and a scheduling order was entered permitting supplemental claim construction on disputed terms from the '051 patent.¹ (D.I. 172)

The '051 patent, titled "Sensor Assemblies and Systems for Monitoring a Dynamic Object," issued on July 1, 2025. (D.I. 210, Ex. A) The '421 patent issued on December 5, 2023, prior to the '051 patent. (*Id.*, Ex. B) Nonetheless, the '051 patent is the parent of the '421 patent, and the '421 patent is a continuation-in-part of the '051 patent. (*Id.*) The '421 and '051 patents share a title and similar specifications disclosing electrical sensor assemblies and systems configured to monitor and transmit data relating to the operating parameters and/or conditions of a tire, such as tread depth, pressure, alignment, and tire or vehicle location. (*Id.*, Exs. A-B)

II. LEGAL STANDARD

The purpose of the claim construction process is to "determin[e] the meaning and scope of the patent claims asserted to be infringed." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370, 388-90 (1996). Construing the claims of a patent presents a question of law, although subsidiary fact finding is sometimes necessary. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 326 (2015) (citing *Markman*, 52 F.3d at 977-78). An actual dispute regarding the proper scope of a claim term must be resolved by a judge, as opposed to the jury. *Markman*, 52 F.3d at 979.

"[T]here is no magic formula or catechism for conducting claim construction." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1324 (Fed. Cir. 2005). Instead, the court may attach the appropriate weight to appropriate sources "in light of the statutes and policies that inform patent

¹ The court held a *Markman* hearing on disputed terms in the '741, '027, and '421 patents on April 16, 2026 and issued a claim construction decision on May 22, 2026. (D.I. 165; D.I. 167; D.I. 183)

law.” *Id.* The words of the claims “are generally given their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Id.* at 1312-13 (internal citations and quotation marks omitted). If the meaning of a claim term is not readily apparent, the court considers sources including “the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004).

“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*, 415 F.3d at 1312 (internal quotation marks omitted). Accordingly, “the claims themselves provide substantial guidance as to the meaning of particular claim terms.” *Id.* at 1314. Claim terms are typically used consistently throughout the patent, and “usage of a term in one claim can often illuminate the meaning of the same term in other claims.” *Id.*

The claims must be read in view of the specification, which “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.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). “[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Phillips*, 415 F.3d at 1316 (citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). The specification may also contain a disclaimer or disavowal of claim scope. *Id.* However, “[e]ven when the specification describes only a single

embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction.” *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (internal quotation marks omitted). The specification “is not a substitute for, nor can it be used to rewrite, the chosen claim language.” *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004).

The court “should also consider the patent’s prosecution history, if it is in evidence.” *Markman*, 52 F.3d at 980. The prosecution history, which is “intrinsic evidence . . . consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent.” *Phillips*, 415 F.3d at 1317. “[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Id.*

In some cases, courts “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.” *Teva*, 574 U.S. at 331. Extrinsic evidence “consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Markman*, 52 F.3d at 980. Although extrinsic evidence “may be useful to the court,” it is “less reliable” than intrinsic evidence, and its consideration “is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” *Phillips*, 415 F.3d at 1318-19. Where the intrinsic record unambiguously describes the scope of the patented

invention, reliance on any extrinsic evidence is improper. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999).

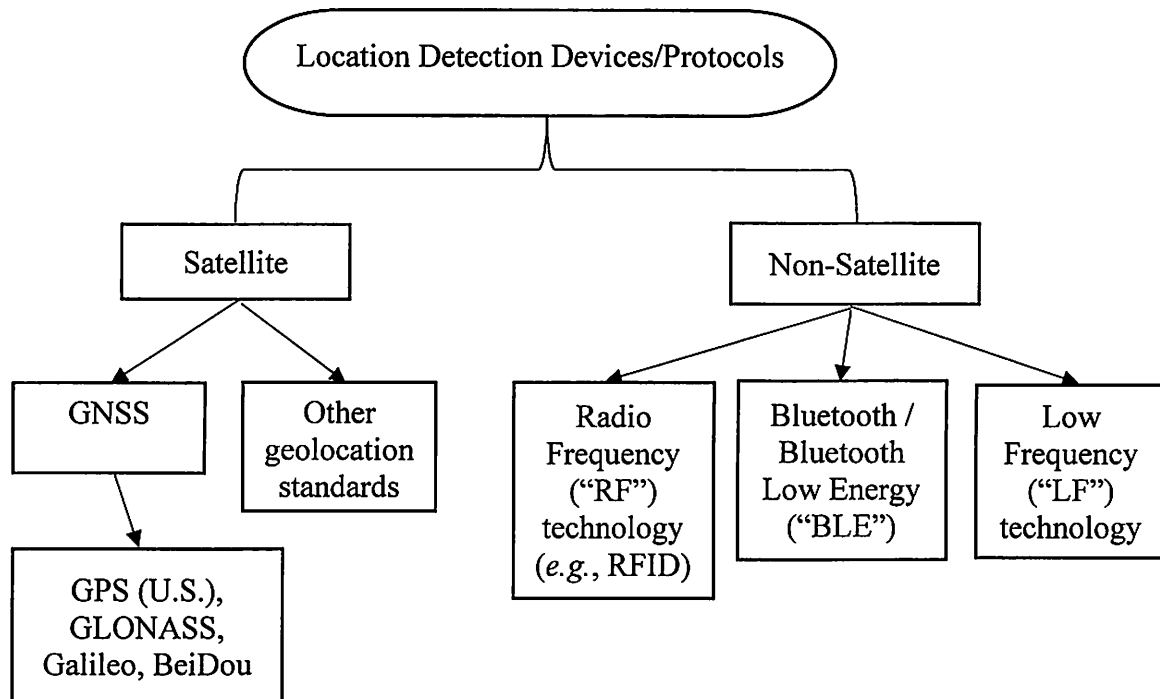
III. ANALYSIS

TERM	PLAINTIFFS' PROPOSAL	DEFENDANT'S PROPOSAL	RECOMMENDED CONSTRUCTION
"global positioning device" '051 patent, cls. 17, 18, 22, 35, 36, 53 '421 patent, cls. 16, 17, 22, 36, 37, 55	a device that provides information to assist in the determination of the location of the device	a device that provides a global position of latitude, longitude, and altitude, such as through GNSS technology	a device that provides a global position of latitude, longitude, and altitude, such as through GPS technology

The parties dispute whether the term "global positioning device" broadly includes any device that provides location information, or whether the device must specifically provide its position on the globe via latitude, longitude, and altitude coordinates. I recommend that the court construe the term "global positioning device" as "a device that provides a global position of latitude, longitude, and altitude, such as through GPS² technology," consistent with Defendant's proposed modification to its construction. (D.I. 209 at 12 n.6) Defendant's proposal is consistent with the intrinsic and extrinsic evidence.

The '051 and '421 patents refer to numerous communication protocols and functionalities without always defining their associated acronyms. For the sake of clarity, the court includes a flowchart to demonstrate how each protocol fits in the overall framework of location detection devices or protocols, consistent with Plaintiffs' representations in the joint claim construction brief, (D.I. 209 at 8, 11, 18):

² "GNSS" stands for "Global Navigation Satellite System." (D.I. 209 at 1 n.2) In the joint briefing, Defendant stated it is "not opposed to replacing the term GNSS with GPS, particularly as the patents at issue are only United States patents." (D.I. 209 at 12 n.6)



The term “global positioning device” appears in certain dependent claims of the ’051 and ’421 patents as a further limitation on the “electrical sensor device” recited in the independent claims. (’051 patent, cls. 17, 18, 22, 35, 36, 53; ’421 patent, cls. 16, 17, 22, 36, 37, 55) The dependent claims indicate that the global positioning device provides information on the location of the vehicle tire. (’051 patent, cls. 18, 36, 53; ’421 patent, cls. 17, 37, 55) The parties dispute whether the claimed global positioning device must provide global position coordinates or whether it includes devices that provide any form of location information. Plaintiffs contend that the foregoing claim language supports their proposal to construe “global positioning device” as “a device that provides information to assist in the determination of the location of the device.” (D.I. 209 at 5-6)

As Defendant explains, however, Plaintiff’s proposed construction gives no meaning to the concept of “global positioning” in the disputed term. The ’051 and ’421 patents contemplate

more than one type of location information,³ and not all location information provides an object's global position. For example, dependent claims 16 and 34 of the '051 patent recite an electrical sensor assembly comprising an "RFID element,"⁴ as distinguished from the global positioning device recited in claims 17 and 35. ('051 patent, cls. 16, 34) The specification states that either "a GPS device or an RFID chip [can be] used to transmit the location of the tire." (*Id.*, col. 23:62-64) Defendant relies on extrinsic evidence defining RFID technology as a means of tracking goods via tags that transmit a radio signal to determine the location of the tag relative to a device. (D.I. 210 at JA 479) In contrast, Plaintiffs' own exhibits support the common understanding that Global Positioning System ("GPS") and GNSS use satellites to compute an object's latitude, longitude, and altitude to determine its three-dimensional position on the globe. (*Id.* at JA 421, JA 429)

Plaintiffs suggest that RFID technology also qualifies as a "global positioning device" while acknowledging that the radio frequency communications used in an RFID chip "are not the

³ To illustrate the fact that a global positioning device provides only one subset of location information, Defendant provides an example of

an electrical sensor device [that] could have locations of (i) the tire it is specifically attached to, such as a front left tire, (ii) the vehicle it is associated with, such as a garbage truck outfitted with the claimed sensing system, (iii) the site where it may be deployed, such as 123 S. Maple St. when the garbage truck picks up that address's trash, or (iv) a global position—the exact, precise point on Earth's surface it is (i.e., latitude, longitude, altitude), as provided by GPS (or another country's GNSS technology). As the garbage truck outfitted with the claimed sensing system works its route, the electrical sensor device's location in the front left tire or specific garbage truck will stay constant but its location in the town's framework will change as the truck moves to different addresses. And its global position (i.e., location in the Earth's framework) will change upon any movement of the sensor.

(D.I. 209 at 14)

⁴ "RFID" stands for radio frequency identification.

same as satellite-based technology such as GPS or GPNSS.” (D.I. 209 at 18) Plaintiffs do not expressly suggest that an RFID element can provide information on a device’s global position, nor do they explain how dependent claims 17 and 35 of the ’051 patent would differ from claims 16 and 34 if an RFID element is equivalent to a global positioning device.⁵ Instead, Plaintiffs suggest that “the adjective ‘global’ . . . describes the broader concept of globally available technologies for position determination, including, for example, Bluetooth and Bluetooth Low Energy (‘BLE’) technologies or RF protocols developed under globally adopted standards.” (*Id.* at 10) Plaintiff’s proposal of the alternate construction “a device that provides information to assist in the determination of the location of the device in accordance with one or more global standards” only highlights the flaws in its argument.⁶ (*Id.* at 22 n.12); *see Optimal Recreation Sols. v. Leading Edge Techs.*, 6 F. App’x 873, 874 (Fed. Cir. 2001) (construing claim term reciting the position associated with a global positioning satellite system as the “position on the face of the earth in terms of latitude and longitude”). It also collapses the distinction between dependent claims 16 and 34 and dependent claims 17 and 35 in the ’051 patent.

A comparison of independent claim 1 and dependent claim 17 of the ’051 patent further supports Defendant’s position that the claimed “global positioning device” describes something more specific than a device that provides location information, as Plaintiffs propose.

“[I]nformation regarding . . . orientation and/or location” is among the data the electrical sensor device can sense, transmit, and/or receive in independent claim 1. (’051 patent, cl. 1) The

⁵ Defendant explains that Bluetooth, BLE, and RF / LF communication describe how data is transmitted, as opposed to establishing a global position, and “[t]ransmitting location information over BLE or RF says nothing about how the position being transmitted was determined in the first place.” (D.I. 209 at 27-28)

⁶ As Defendant states, “[t]he word ‘global’ in ‘global positioning device’ modifies the position the device provides—i.e., a position on the globe—not the geographic ubiquity of the communication standard the device happens to use.” (D.I. 209 at 24)

“and/or location” language in the independent claim leaves open the possibility that an electrical sensor device may sense, transmit, and/or receive only location information in claim 1. Claim 17 further limits the electrical sensor device to a global positioning device, and claim 18 explains that the global positioning device is used to provide information on the location of the vehicle tire. (*Id.*, cls. 17-18) Plaintiffs’ proposal to construe “global positioning device” as “a device that provides information to assist in the determination of the location of the device” is no more specific than the description of the electrical sensor device in independent claim 1. In keeping with “the general assumption . . . that different terms have different meanings[,]” the location data provided by the claimed global positioning device must be narrower than the location information referenced in the independent claims and must differ from the location information provided by an RFID element. *Symantec Corp. v. Comput. Assoc. Int’l, Inc.*, 522 F.3d 1279, 1289 (Fed. Cir. 2008).

Neither side suggests that the prosecution history of the ’051 patent contains a disclaimer or disavowal of scope. However, an office action issued by the examiner on November 23, 2022 provides some support for Defendant’s proposed construction. The examiner considered a prior art tire sensor system “comprising wherein the electrical sensor device further comprises a global positioning device” and determined that it would have been obvious to a person of ordinary skill in the art “to provide a global positioning device as taught by [the prior art reference] . . . for the purpose of providing location tracking of the tire[.]” (D.I. 210 at JA 655)⁷ A review of the prior art reference cited by the examiner shows the inclusion of global positioning system (GPS) capabilities in the sensor unit to provide location tracking of the tire or vehicle. (*Id.* at JA 672-73) The examiner’s recognition that the GPS capability in the prior art reference meets the

⁷Specifically, the examiner evaluated U.S. Publication No. 2019/0187027 (Lin).

“global positioning device” term recited in the application leading to the issuance of the ’051 patent supports Defendant’s position that “global positioning” refers to the global coordinates of the device.

Plaintiffs take issue with three aspects of Defendant’s proposed construction. First, Plaintiffs contend that there is no basis to include GNSS, latitude, longitude, or altitude in the definition of “global positioning device” because none of these terms are referenced in the specifications or claims of the ’051 or ’421 patents. (D.I. 209 at 9-10) But the specifications repeatedly reference GPS, which falls within the scope of (and is narrower than) GNSS. (’051 patent, cols. 14:35-40, 14:52-54, 23:62-64; ’421 patent, cols. 15:31-37, 15:50-53, 29:15-17; D.I. 210 at JA 421) Plaintiffs’ own exhibits also support the common understanding that GPS and GNSS use satellites to compute an object’s latitude, longitude, and altitude and determine its three-dimensional position on the globe. (D.I. 210 at JA 421, JA 429) Moreover, Plaintiffs highlight WO 2020/036859 (“WO ’859”), a reference owned by Defendant and cited during prosecution of the ’051 and ’421 patents. (D.I. 209 at 8-9) Consistent with Defendant’s proposed construction, WO ’859 describes GNSS as a specific type of location-detection device / geo-location receiver. (D.I. 210, Ex. X at 12)

Next, Plaintiffs contend that “nothing in the intrinsic evidence requires that the global positioning device ‘provides’ a position.” (D.I. 209 at 10) Instead, Plaintiffs posit that the device provides information from which the position is determined. (*Id.*) Plaintiffs do not elaborate or explain how this purported distinction impacts the scope of the claim language. In response, Defendant maintains that the dependent claims refer to the claimed system receiving the output of the global positioning device and using the information on global position to determine the location of the tire. (*Id.* at 25) Defendant’s argument is consistent with the claim

language, which recites a sensing system configured to receive data from the global positioning device. (*See, e.g.*, '051 patent, cls. 1, 13, 17)

Finally, Plaintiffs argue that Defendant's proposed construction amounts to a backdoor attempt to include GPS as a claim limitation, when "GPS is provided as only one example of a means for determining the location of a tire." (D.I. 209 at 11) But Defendant's proposed construction refers to GNSS (which is broader than GPS) only as a non-limiting example of a protocol to determine global positioning in the form of latitude, longitude, and altitude coordinates. To the extent that Plaintiffs suggest "global positioning device" should encompass Bluetooth, BLE, low frequency, or radio frequency communications, Plaintiffs provide no evidence that these protocols can provide information on a device's global positioning.

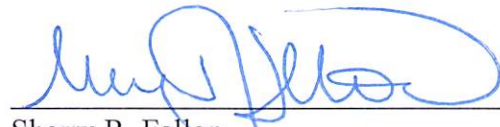
IV. CONCLUSION

For the reasons set forth above, I recommend that the court construe the term "global positioning device" as "a device that provides a global position of latitude, longitude, and altitude, such as through GPS technology."

This Report and Recommendation is filed pursuant to 28 U.S.C. § 636(b)(1)(B), Fed. R. Civ. P. 72(b)(1), and D. Del. LR 72.1. The parties may serve and file specific written objections within fourteen (14) days after being served with a copy of this Report and Recommendation. Fed. R. Civ. P. 72(b)(2). The objections and responses to the objections are limited to ten (10) pages each. The failure of a party to object to legal conclusions may result in the loss of the right to de novo review in the District Court. *See Sincavage v. Barnhart*, 171 F. App'x 924, 925 n.1 (3d Cir. 2006); *Henderson v. Carlson*, 812 F.2d 874, 878-79 (3d Cir. 1987).

The parties are directed to the court's Standing Order For Objections Filed Under Fed. R. Civ. P. 72, dated March 7, 2022, a copy of which is available on the court's website, <http://www.ded.uscourts.gov>.

Dated: September 30, 2026



Sherry R. Fallon
UNITED STATES MAGISTRATE JUDGE