

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of )
)
Continental Automotive Systems, Inc. and ) ET Docket No. 22-382
Continental Automotive GmbH. )
)
)
Request for Waiver of Section 15.231(e) of the )
Commission’s Rules. )

ORDER

Adopted: December 19, 2023

Released: December 19, 2023

By the Chief, Office of Engineering and Technology:

I. INTRODUCTION

1. By this Order, we grant a request by Continental Automotive Systems, Inc. and Continental Automotive GmbH (Continental) to waive Section 15.231(e) of the Commission’s rules to permit the certification and authorization for the newest update of Continental’s tire pressure monitoring system (TPMS).1 For the reasons discussed below, we find there is good cause to grant Continental’s request for waiver.

II. BACKGROUND

2. Continental has designed the next generation of its TPMS to accelerate the process used to measure and alert drivers of a low-pressure condition inside of a tire.2 Continental’s website describes TPMS as a system that “measures the pressure inside a tire directly, transmits the reading and displays it. The driver is alerted of a critical situation by means of a corresponding signal.”3 Continental’s website states that to measure the tire pressure: “Battery-fed sensors mounted on the rim and integrated into the valve measure the tire’s inflation pressure and sends a high-frequency signal with coded information to a receiver. Special software in the control device then processes the data received and shows it on a display on the instrument panel.”4 Continental explains this new design will significantly reduce the

1 Request by Continental Automotive systems, Inc. and Continental Automotive GmbH for Waiver of Section 15.231(e) of the Commission’s Rules (Continental Waiver Request) (filed Aug. 30, 2022). Continental filed its request in INBOX-PART 15 in the Commission’s Electronic Comment Filing System.

2 Continental Waiver Request at 2.

3 See Continental Group, Tire Pressure Monitoring System (TPMS), https://www.continental-automotive.com/en-gl/Passenger-Cars/Safety-and-Motion/Products/Sensors/Tire-Information-Systems-(1)/Tire-Pressure-Monitoring-System (Last visited December 5, 2023).

4 See Continental Group, Tire Pressure Monitoring System (TPMS), https://www.continental-automotive.com/en-gl/Passenger-Cars/Safety-and-Motion/Products/Sensors/Tire-Information-Systems-(1)/Tire-Pressure-Monitoring-System (Last visited December 5, 2023)

amount of time it takes the system to measure and notify a driver of under-inflated tires by increasing the data transfer from the sensor to the monitor after the installation or reset of the sensor.<sup>5</sup>

3. To allow for the certification and to seek authorization of its new TPMS design, Continental requests to waive the periodic operation timing requirements in section 15.231(e) of the Commission's rules.<sup>6</sup> Section 15.231(e) obligates certain Part 15 intentional radiators to have a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.<sup>7</sup> Continental's TPMS device is an intentional radiator. According to Continental, its next generation TPMS, which incorporates design changes meant to increase safety, would operate in the 315 MHz and the 433 MHz bands, and have more frequent emissions than those prescribed by Commission rules.<sup>8</sup> Because Continental's TPMS device would exceed the periodic timing requirements—albeit on a limited, infrequent basis—Continental seeks a waiver of this rule.<sup>9</sup>

4. Continental's TPMS will operate under the Commissions' Part 15 rules governing the periodic operation of intentional radiators within the 40.66-40.77 MHz band and in spectrum bands above 70 MHz.<sup>10</sup> Part 15 permits low-power radio frequency devices to operate without an individual license from the Commission.<sup>11</sup> Unlicensed intentional radiating transmitters share frequency bands with authorized radio services and, like all unlicensed devices, may not cause harmful interference to authorized radio services and must accept interference that may be caused by the operation of other stations and devices.<sup>12</sup>

5. The Office of Engineering and Technology issued a Public Notice soliciting comment on Continental's request on October 28, 2022.<sup>13</sup> No comments or reply comments were filed in response.

### III. DISCUSSION

6. We are authorized to grant a waiver under Section 1.3 of the Commission's rules if the petitioner demonstrates good cause for such action.<sup>14</sup> Good cause, in turn, may be found and a waiver

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<sup>5</sup> Continental Waiver Request at 2-4.

<sup>6</sup> Continental Waiver Request at 1.

<sup>7</sup> See 47 C.F.R. § 15.231(e).

<sup>8</sup> Continental Waiver Request at 1-3. See IBL-Lab GmbH, Test Report, at 8, 11 (2022) (laying out the 315 MHz center frequency of one of Continental's Tire Pressure Monitoring Systems for FCC ID KRTIS -10D. On file in FCC's equipment authorization system under FCC ID KRTIS-10D). See also, SGS Compliance Certification Services Inc., FCC Radio Test Report at 1-2 (2022) (laying out the 433.92 MHz operation frequency of one of Continental's Tire Pressure Monitoring Systems for FCC ID KRTIS-21. On file in FCC's equipment authorization system under FCC ID KR5TIS 21).

<sup>9</sup> Continental Waiver Request at 2-3. We also note that Continental proposes two conditions be included if their waiver request is granted. For a discussion of conditions, see *infra* at paragraph 12.

<sup>10</sup> Continental Waiver Request at 2.

<sup>11</sup> 47 CFR §§ 15.1 *et seq.*

<sup>12</sup> 47 CFR § 15.5(b).

<sup>13</sup> *Office of Engineering and Technology Seeks Comment on Continental's Request for Waiver of Section 15.231(e) of the Commission's Rules for Intentional Radiators*, ET Docket No 22-382, Public Notice (OET 2022).

<sup>14</sup> 47 CFR § 1.3; see also *ICO Global Communications (Holdings) Limited v. FCC*, 428 F.3d 264 (D.C. Cir. 2005); *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

granted “where particular facts would make strict compliance inconsistent with the public interest.”<sup>15</sup> To satisfy this public interest requirement, the waiver cannot undermine the purpose of the rule, and there must be a stronger public interest benefit in granting the waiver than in applying the rule.<sup>16</sup> We find that this standard has been met.

7. In its Waiver Request, Continental argues that including the design change will improve TPMS by accelerating the “learning and localization process.”<sup>17</sup> Continental posits that improvements in this process will result in the critical safety benefit of warning drivers sooner of under-inflated tires.<sup>18</sup> According to Continental, its new TPMS design completes the “learning and localization process” in 2 to 3 minutes whereas the existing design performs the same process in 7 to 8 minutes during optimum conditions.<sup>19</sup> This reduction in time represents a 200% to 300% decrease in the initial calibration time for the TPMS.<sup>20</sup> To achieve this improvement, Continental’s new design would operate outside the periodic timing and duration requirements of Section 15.231(e).<sup>21</sup> Specifically, the design improvement necessitates that during the initial five instances after a TPMS sensor is installed or reset, the transmissions would occur every 6 seconds for the first 144 seconds that the vehicle is in motion.<sup>22</sup> This new design, therefore, fails to meet the 10 second quiet period timing requirement.<sup>23</sup>

8. The transmission time limit in Section 15.231(e) was established to reduce the potential for interference to the authorized radio services.<sup>24</sup> Intentional radiators subject to Section 15.231(e) must be provided with a means to automatically limit operation so that the duration of each transmission is not greater than one second with a silent period between transmissions of 30 times the duration of the transmission and at least 10 seconds.<sup>25</sup> In its request, Continental states its new TPMS would operate outside of the limits set forth in section 15.231(e) for the first few minutes of operation during the first few drive cycles after the initial installation and resetting of the sensors.<sup>26</sup> Based on the information in the record, we observe that the total emissions from this Continental’s new design of the sensors would result in similar emissions to the previous design, which operates within the requirements of

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<sup>15</sup> *Northeast Cellular*, 897 F.2d at 1166; *see also ICO Global Communications*, 428 F.3d at 269 (quoting *Northeast Cellular*); *WAIT Radio*, 418 F.2d at 1157-59.

<sup>16</sup> *See, e.g., WAIT Radio*, 418 F.2d at 1157 (stating that even though the overall objectives of a general rule have been adjudged to be in the public interest, it is possible that application of the rule to a specific case may not serve the public interest if an applicant’s proposal does not undermine the public interest policy served by the rule); *Northeast Cellular*, 897 F.2d at 1166 (stating that in granting a waiver, an agency must explain why deviation from the general rule better serves the public interest than would strict adherence to the rule).

<sup>17</sup> Continental Waiver Request at 3-4.

<sup>18</sup> Continental Waiver Request at 2.

<sup>19</sup> Continental Waiver Request at 3-4.

<sup>20</sup> Continental Waiver Request at 3-4.

<sup>21</sup> Continental Waiver Request at 2-3, 6.

<sup>22</sup> Continental Waiver Request at 2.

<sup>23</sup> Continental Waiver Request at 2-3, 6-7.

<sup>24</sup> 47 CFR 15.231(e). *See Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License*, GN Docket No. 87-389, First Report and Order, 4 FCC Rcd 3493, 3495 para. 13 (1989) (“The [Part 15] rules are designed to provide a balance of our competing goals of eliminating unnecessary regulatory barriers and burdens on the development of new low power RF equipment and maintaining adequate interference protections for authorized radio services and recognized passive users of low level RF signals”).

<sup>25</sup> 47 CFR 15.231(e).

<sup>26</sup> Continental Waiver Request at 2-3.

Section 15.231(e).<sup>27</sup> More specifically, because the TPMS is designed to transmit for a duration ranging between 3 to 15 milliseconds and the total emissions for a single transmission is 200 milliseconds or less, the resulting total on time for the device with the specifications that Continental proposes is similar to the total on time for an existing TPMS with a total emissions for a single transmission of 333 milliseconds that strictly complies with our rules. Additionally, even though the Continental TPMS sensor is designed to temporarily transmit more frequently than the 10 second quiet period requirement, its operation in this mode would be in limited, infrequent cases where the TPMS within the tire is replaced or reset.<sup>28</sup> Continental also argues that because of operational modes with shorter pulse durations the total on time of the device will not have an increased potential to interfere with existing users in the band.<sup>29</sup> We agree. In this instance, adherence to the periodic timing requirement in Section 15.231(e) could result in the Continental TPMS having to transmit its signal over a longer period to complete its “learning and localization” process. A longer transmission period could potentially decrease the efficiency of the sensor and consequently could increase the potential for interference.

9. We find that Continental’s proposed TPMS, when used in the manner described in its waiver request and subject to the conditions we impose below, is sufficiently similar to a TPMS operating under maximum transmission time limits provisioned in our rules. That is, the time of emissions transmission for the first 144 seconds of operations would appear to any victim receiver to be no different than any other TPMS operating under our rules. Furthermore, the power level under which the Continental TPMS will be permitted to operate will comply with Commission rules and therefore would be no more likely to cause interference than existing TPMS systems operating in the band. As the Continental TPMS device would only operate outside of the Section 15.231(e) prescribed timing requirement temporarily and for very limited intervals, a waiver of our rules would not contravene the purpose of the rule and in some instances actually produce less interference than if the device in question were to strictly comply with the rules.

10. As designed, Continental’s new TPMS would have limited proliferation and would not have a high potential for causing harmful interference to the authorized services in the bands. Continental’s TPMS devices use small batteries that are installed on vehicles and inside of tires.<sup>30</sup> The required power level for these devices is sufficiently low to enable TPMS sensor life cycles of several thousand miles or several years without requiring replacement (*i.e.*, the emissions from these devices are

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<sup>27</sup> See Continental Waiver Request at 7. Continental explains that under Section 15.231(e) the range in which each transmission is a continuous 333 milliseconds of emissions, followed by ten seconds without an emission, would have combined emissions during the first 144 seconds of driving motion that are virtually identical to its newly designed TPMS. Continental states the emissions in the new design are between 3 to 15 milliseconds and that the combined length of a single RF emission will be 200 milliseconds or less. We calculate the total transmission on time within 144 seconds for a device operating in strict compliance with our rules as 4.64 seconds. We calculate the total transmission on time of Continental’s newly designed TPMS as 4.65 seconds within the first 144 seconds of operation. The details of these calculations are as follows: Operations under strict compliance with our rules would allow for a normal Tire Pressure Monitoring System to operate with a maximum transmission duration of 0.333 and a quiet period duration of 10 seconds. If we were to look at this over the time observed of 144 seconds, then the total transmission impulses within these 144 seconds would be 13.935. Finding the total transmission on time within these 144 seconds would yield 4.640 seconds [Total Transmission on time = Transmission duration \* Total transmission impulses (0.333 seconds\*13.935 = 4.640 seconds)]. To find total transmission on time for Continental’s new TPMS, we use the proposed maximum transmission duration of 200 milliseconds (0.2 seconds) and a quiet period duration of 6 seconds, observed over the same 144 seconds would yield 23.225 transmission impulses. Calculating the total transmission on time for the 200 milliseconds transmission yields 4.645 seconds [Total Transmission on time = Transmission duration \* Total transmission impulses (0.2 seconds\*23.225 = 4.645 seconds)].

<sup>28</sup> Continental Waiver Request at 4.

<sup>29</sup> Continental Waiver Request at 7.

<sup>30</sup> Continental Waiver Request at 7.

so low that they are designed to run for years off of a single small cell battery).<sup>31</sup> Further, the low level of emissions from these devices will be shielded by the tire and the body of the vehicle, which offers additional levels of signal attenuation.<sup>32</sup> These characteristics give us added confidence that operation of Continental's TPMS will not significantly increase the potential for harmful interference to authorized users. We also observe that this product is designed to comply with all other technical limits in our rules for Part 15 intentional radiators, except for that which we waive. For these reasons we conclude that waiver of Section 15.231(e) to Continental's TPMS will not undermine the purpose of the rule.

11. We find that Continental's TPMS device promises to deliver enhanced public interest benefits. The narrow relief we are providing will permit the deployment of innovative unlicensed applications that offer significant benefits to the public without increasing significant potential interference to authorized users in the band. Considering the importance of automobile safety, we find a stronger public interest benefit in granting the waiver than in applying the rule. Granting the waiver will provide substantial public benefit by, among other things, permitting the deployment of enhanced tire pressure monitoring systems that comprise a critical and important safety system on vehicles.<sup>33</sup> Without a waiver of the periodic timing requirement in Section 15.231(e), it is highly likely that Continental would not be able to produce innovative TPMS sensors that significantly decrease time for completing the "learning and localization" process. Granting the waiver will allow Continental to achieve its objective of warning drivers sooner of underinflated tires.<sup>34</sup> Providing drivers with such information may also reduce the number of vehicles that experience catastrophic tire failures.<sup>35</sup> In addition to the public safety benefits, Continental also suggests that its TPMS sensors will enable drivers to operate their vehicles with properly inflated tires and this in turn will lead to more efficient use of fuel.<sup>36</sup> Finally, as Continental notes, granting the waiver will help provide economies of scale and offer a competitive and harmonized product worldwide, which should lead to cost savings for customers.<sup>37</sup> Thus, we conclude that granting the waiver request will benefit the public interest.

12. We make the Continental waiver subject to a number of conditions. We require that the Continental TPMS device be certified by an authorized Telecommunication Certification Body (TCB) and that a copy of this Order be submitted with the application for certification to ensure that the TCB is aware of this waiver.<sup>38</sup> We also specify the technical requirements that the Continental TPMS device must meet, including the periodic operation timing requirements and minimum silent period between transmissions. These waiver conditions will help to ensure that the Continental TPMS operational parameters used to perform our analysis are those used to certify the newly designed device. This requirement will facilitate coexistence between incumbent users and unlicensed device users operating in the 315 MHz and 433 MHz bands. We note Continental has indicated that, for purposes of its operations

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<sup>31</sup> See, e.g., Federal Motor Vehicle Safety Standards; Tire Pressure Monitoring Systems; Controls and Displays Other Facilities, Docket No. 2005-20586, Final rule, 70 FR 18136, 18168, (2005), (the National Highway Traffic Safety Administration citing to comments that manufacturers design TPMS to provide a reasonable battery life of 8-10 years).

<sup>32</sup> Continental Waiver Request at 7.

<sup>33</sup> Continental Waiver Request at 8.

<sup>34</sup> Continental Waiver Request at 5.

<sup>35</sup> Continental Request at 8-9.

<sup>36</sup> Continental Request at 9.

<sup>37</sup> Continental Request at 8.

<sup>38</sup> All requests for equipment authorization must be submitted in writing to a Telecommunication Certification Body (TCB). 47 CFR § 2.911(a). TCBs are not permitted to waive the rules and therefore may only certify a non-compliant device if the Commission has granted a waiver of those rules with which the device does not comply. 47 CFR § 2.62(f)(10)(i).

under a waiver, it is prepared to satisfy such a requirement.<sup>39</sup> As such, we will require that the RF emission period, not including the intermittent non-transmission pauses, during the first 144 seconds of the first 5 drive cycles of the TPMS be limited to 200 milliseconds. For purposes of this waiver, we will require the minimum silent period between transmissions to be 6 seconds during the first 144 seconds the vehicle is in motion for the initial five drive cycles that exceed 144 seconds after installation or reset of the TPMS. This condition will prevent these devices from operating outside of the periodic timing requirement in Commission rules indefinitely and thereby prevent these devices from engaging in a singular continuous transmission. Operation pursuant to the waiver is expressly conditioned on compliance with the Commission's rules except as waived, which, in this case, is limited to Section 15.231(e) under the conditions we set forth below.

13. For these reasons, we conclude there is good cause to waive the requirements of Section 15.231(e) of the Commission's rules to permit the certification and authorization of Continental's TPMS that does not comply with the periodic timing and duration requirements in that section. This waiver is subject to the following conditions:

- 1) The Continental Tire Pressure Monitoring System shall be certified by an authorized Telecommunications Certification Body. A copy of this Order must be submitted with the application for certification.
- 2) The Continental TPMS device shall operate with a minimum silent period between transmissions of 6 seconds during the first 144 seconds the vehicle is in motion for the initial five drive cycles that exceed 144 seconds after installation or reset of the Tire Pressure Monitoring System.
- 3) Individual transmission periods, not including the intermittent non-transmission pauses, during the first five drive cycles after the installation or resetting of the device shall not exceed 200 milliseconds.

#### IV. ORDERING CLAUSES

14. Accordingly, pursuant to authority in Sections 0.31, 0.241, AND 1.3 of the Commission's rules, 47 CFR §§ 0.21, 0.241, and 1.3, and Sections 4(i), 302, 303(e), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302, 303(e), and 303(r), IT IS ORDERED that the Request for Waiver filed by Continental Automotive Systems, Inc. and Continental Automotive GmbH IS GRANTED, consistent with the terms set forth above. This action is effective immediately.

15. IT IS FURTHER ORDERED that, if no applications for review are timely filed, this proceeding SHALL BE TERMINATED and the docket CLOSED.

FEDERAL COMMUNICATIONS COMMISSION

Ronald T. Repasi  
Chief  
Office of Engineering and Technology

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<sup>39</sup> Continental Request at 9.