

**Timco Engineering Inc.
FCC Authorized Telecommunications
Certification Body (TCB)**

**Nokia, Global Product Compliance Laboratory
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December 7, 2018

**Bruno Clavier – Chief Engineer
Timco Engineering Inc.
849 N.W. State Road 45
P.O. Box 370
Newberry, Florida 32669**

Dear Mr. Clavier

The Nokia AirScale Micro RRH 3.5GHz 4T/4R 20W (**AZQCRH1**) is the subject of this request for a Part 96 Original FCC Product Certification Filing under **FCC ID: 2AD8UAZQCRH1**. The **AZQC-CBRS** is a 150 MHz instantaneous bandwidth LTE Transceiver with a total power output capability of 20 Watts for all 4 ports. This 4x5W MIMO transmitter supports 4 **LTE-TDD** carriers placed anywhere in the **Part 96Z Citizens Broadband Radio Service (CBRS)** spectrum. Nokia Bell Labs, part of the Nokia family of companies, hereby requests this Original Filing under **FCC ID: 2AD8UAZQCRH1** for Part 96 Certification with multiple emissions designators and multicarrier operation. This application for Part 96 operation follows utilizing the procedural requirements specified in FCC Part 2 Subpart J – Equipment Authorization Procedures and FCC pre-approval guidance (PAG Request) (Tracking Number **148851**). This application for Part 96 operation is possible now that Spectrum Allocation Server (SAS) operation can be certified under FCC and WINN-Forum- CBRS Alliance test requirements.

This application is for Part 96 CBRS Class B operation is for the full 3550-3700 MHz CBRS band. The **AZQC-CBRS** will use 4x5W MIMO operation using 10M0F9W and 20M0F9W emissions designators. Two test reports are in the exhibits. The first is the Part 2.1033 (c) Technical Report for operation over the full 3550-3700 MHz Part 96 frequency range. The second is the Spectrum Allocation Server - Citizens Band Radio Service - Device Conformity Assessment Test Report.

The measurement exhibits attached to this application demonstrate full compliance with FCC Part 96 following the procedural requirements specified in FCC Part 2 Subpart J – Equipment Authorization Procedures and FCC pre-approval guidance (PAG Request) (Tracking Number 148851). The data, summarized below, is in the form presently used by the Commission's Radio Equipment List.

| | |
|----------------------------------|--|
| Equipment Identification: | 2AD8UAZQCRH1 |
| Rules Part Number: | Part 96 |
| Frequency Range: | Transmit/ Receive 3550-3700 MHz (LTE-TDD) |
| Output Power: | 20 Watts Total Output for 4 Ports operating in a 4x5W configuration |
| Output EIRP: | 50.12 Watts EIRP |
| Frequency Tolerance: | ± 0.05 ppm |
| Emission Designators: | 10M0F9W, 20M0F9W |
| Grant Notes: | EP, MO, 20W total for 4 ports, Multicarrier MIMO Operation |

Output power listed is the maximum combined tuned conducted power. Professional installation required. This transmitter must be installed to provide a separation distance of at least 75-cm from all persons. Unless otherwise addressed, antenna gain for single carrier 10 MHz operation is limited to no more than 4 dBi to ensure compliance with 96.41 (b) EIRP limits for Category B CBSD. This product must not be co-located or operating in conjunction with any other antenna or transmitter, except as described in this filing, or in accordance with FCC multi-transmitter product guidelines. The grantee must provide installers and operators, with installation and operating instructions for satisfying FCC multi-transmitter product guidelines. This device supports LTE of 10 and 20 MHz bandwidth modes for TDD LTE Band 48.

Attached are the FCC Form 731 (Application for Equipment Authorization – Radio Frequency Devices), the required measurement data and exhibits specific to this request for authorization of the **AZQC-CBRS AZQCRH1**. The technical or non-technical contact at Nokia Bell Labs will comply with any request for additional information should the need arise. The attached exhibits with the applicable FCC Rule section are assembled and presented in accordance with the *Table of Contents* attachment.

Should there be any questions or procedural issues please feel free to contact me by email and/or phone.
Sincerely,



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Att. Table of Contents for the Nokia **Flexi Zone Multiband Outdoor (AZQC) Micro BTS CBRS (2AD8UAZQCRH1)**
Product Certification Report

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Cover Letter

| <u>Exhibit #</u> | <u>FCC Rule Number</u> | <u>Description</u> | |
|------------------|------------------------------|--|----------------|
| Exhibit 1 | Section 2.1033(a) | FCC Form 731 | |
| Exhibit 2 | Section 2.911 (d) | Qualifications and Certifications | |
| Exhibit 3 | Section 2.1033(c)(1,2 & 4-7) | Manufacturers, FCC Identifier, Emission, Range of RF Power & Frequency | |
| Exhibit 4 | Section 2.1033(c)(11) | Drawing of the Identification Label | |
| Exhibit 5 | Section 2.1033(c)(8,9) | Active Circuit Devices Drive Levels, Tune-Up procedure | (Confidential) |
| Exhibit 6 | Section 2.1033(c)(10, 13) | Block Diagram, Operational Description, | (Confidential) |
| Exhibit 7 | Section 2.1033(c)(10) | Complete Circuit Diagrams | (Confidential) |
| Exhibit 8 | Section 2.1033(c)(12,3) | Instruction Book (Installation Manual or Users Manual) | (Confidential) |
| Exhibit 9 | Section 2.1033(c)(12) | Internal Photographs of the Equipment | (Confidential) |
| Exhibit 10 | Section 2.1033(c) (12) | External Photographs of the Equipment | |
| Exhibit 11 | Section 2.1033(c) (10, 13) | Description of Modulation System, | |

Part 2 Part 96 Test Report

| <u>Paragraph#</u> | <u>FCC Rule Number</u> | <u>Description of Test Report Exhibits</u> |
|-------------------|------------------------|--|
| 4 | Section 2.1033(c)(14) | Listing of Required Measurements |
| 4.1 | Section 2.1046 | Measurement of Radio Frequency Power Output |
| 4.2 | Section 2.1047 | Measurement of Modulation Characteristics |
| 4.3 | Section 2.1049 | Measurement of Occupied Bandwidth and Edge of Band Emissions |
| 4.4 | Section 2.1051 | Measurement of Spurious Emissions at Antenna |
| 4.5 | Section 2.1053 | Field Strength of Spurious Radiation |
| 4.6 | Section 2.1055 | Measurement of Frequency Stability |
| 4.7 | | List of Test Equipment |
| 4.8 | | Photographs of the Test Setups |
| 4.9 | | Facilities and Accreditation |

WINN-Forum Test Report

Winn Forum Spectrum Allocation Server-Citizens Band Radio Service Device Conformity Assessment Test Report