



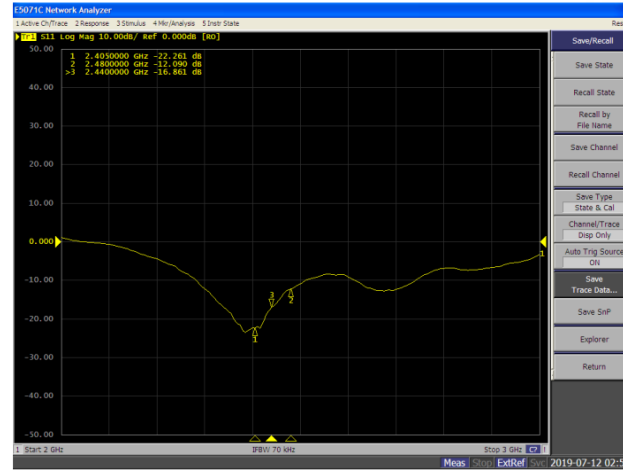
Wireless Engineering Services



Wireless Engineering Services Overview

- Optimize the wireless performance of your IoT connected product by relying on Centero's wireless engineering expertise
- Centero offers the following services
 - Antenna selection and qualification
 - Custom antenna design
 - Wireless, EMC and safety compliance and certification services

Antenna Selection and Qualification Engineering Service



Antenna Selection and Qualification

Tasks and Activities

Antenna Selection

Centero selects 2-3 off-the-shelf antennas that match field instrument requirements (frequency, propagation patterns desired, enclosure selection, hazardous classification etc).

Equipment Used

- RF Network Analyzer and Spectrum Analyzer

Full RF Antenna Characterization

- Frequency response plots
- Assess isotropic and/or directionality of the antenna
- Assess true antenna gain and propagation characteristics in real-field deployment conditions

RF Matching

Engineer optimal matching of antenna to the instrument circuitry and enclosure.

Antenna Selection and Qualification

Deliverables

Antenna Selection

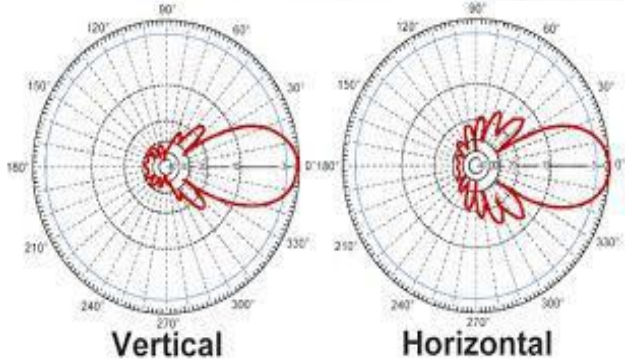
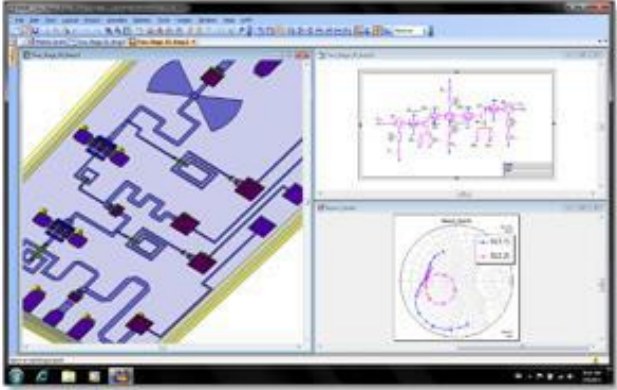
Centero selects and recommends the optimal antenna for the field instrument based on the performance criteria selected and test results.

Centero also makes recommends optimal matching circuitry if needed.

Engineering Test and Validation Reports

- Full antenna characterization engineering report
- Frequency response plots
- Gain response + directionality assessment
- Antenna matching circuitry

Custom Antenna Design Engineering Service



Custom Antenna Design

Tasks and Activities

Antenna Design

Centro designs a custom antenna tailored to the field instrument based on requirements and performance metrics desired.

Equipment Used

- RF Network Analyzer
- RF Spectrum Analyzer
- Microwave Office Software
- CST Studio Suite

PCB Antenna Design

- Design antenna that meets optimal gain and propagation pattern for the field instrument
- Simulate antenna characteristics and matching to the field instrument circuitry and enclosure
- Select appropriate antenna enclosure and materials
- Generate engineering design and manufacturing package

Custom Antenna Design

Tasks and Activities

Production and Manufacturing

- Manufacture 5 samples of the antenna designed
- Place antenna in appropriate antenna enclosure (mechanical)

Testing and Validation

Full RF characterization of custom antenna designed includes:

- Full propagation patterns
- Frequency response plots
- Assess isotropic and/or directionality of the antenna
- Assess true antenna gain and propagation characteristics in real-field deployment conditions

Custom Antenna Design

Deliverables

Deliverables

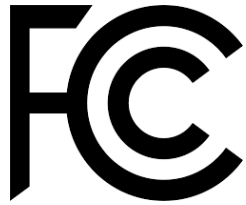
- Five (5) fully functional antennas
- Engineering package – includes all design files
- Manufacturing package –includes all production files

Engineering Validation Report

Full antenna characterization engineering report:

- Full antenna propagation plots
- Frequency response plots
- Gain response + directionality assessment
- Antenna matching circuitry

Wireless, EMC and Safety Compliance and Certifications



Wireless Compliance and Certifications

- Full turnkey engineering services include
 - Wireless certifications: FCC/ISED, ETSI, Giteki, KC, Anatel etc.
 - Emissions, ESD, RFI and Immunity: EN 301 489, EN55032, EN 6100-4-2, EN 6100-4-3 etc.
 - Safety approvals: LVD EN 60950-1, IEC 62368-1 etc.
- Centero's team performs in-house pre-testing to ensure compliance prior to submitting for official lab compliance testing resulting in significant cost savings

Contact

For additional information please visit

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