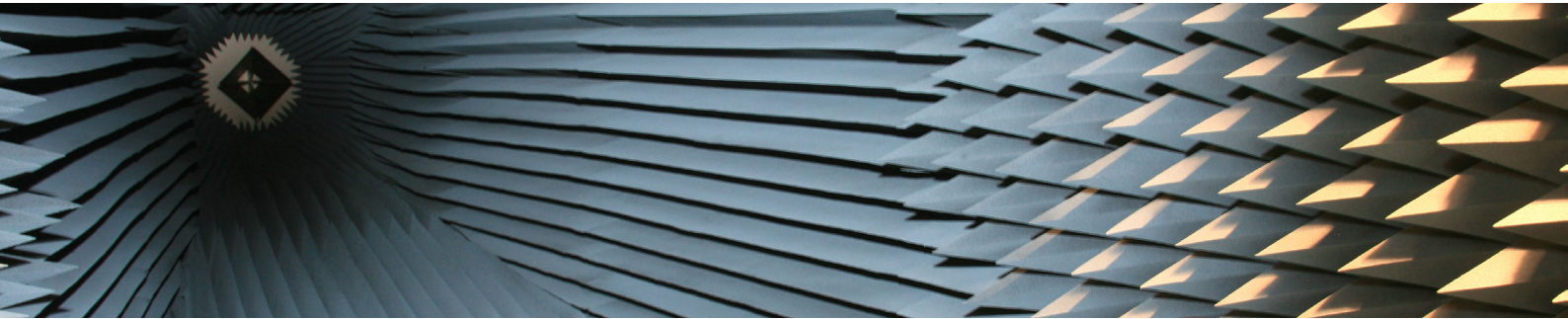


# ISA.10

## Initial System Review & Analysis



Service name:

### ISA.10 Initial System Review & Analysis

#### Deliverables:

Report and Interactive Technical Support

#### Duration:

2 days

#### Items:

- A High Level System Review
- B Antenna Performance Requirements Analysis
- C Antenna Selection Options
- D Antenna Integration Plan

#### What is the problem or concern we are addressing?

Your product has 1 or more radios in it that need antennas. The antenna solution needs to have specific performance goals, which with the rest of the system requirements drives the antenna selection and implementation options. Every product with a radio in it tends to have slightly different system level needs. Factors like performance, cost, weight, size, manufacturing complexity and physical reliability all contribute to determining the starting point or antenna selection.



#### The Process:

##### Part 1

Taoglas will review your product details with you to understand your design priorities. Reviewing your files typically takes a day. Once the files are reviewed we'll need to meet with your engineering team and project manager to sort out the rest of the details.

We'll help you define clear performance requirements for the antennas in your system. For some radios, performance is the main driving factor in order to meet performance or certification requirements. For other radios, performance expectations are not high and factors like cost and size are the drivers.

##### Examples of performance requirements include:

- Antenna efficiency per cellular frequency band to meet carrier/network operator requirements;
- Antenna gain requirements for a WiFi link
- Polarization requirements for a GPS receiver antenna
- Frequency, polarization, and gain requirements for a satellite radio antenna
- RF isolation required between antennas of different radios to maintain functionality

We'll use these details to define a set of antenna options relevant to each radio in your product. We'll then discuss the pros and cons of the options with you to help you decide on the best options for your device. Based on the antenna selections, Taoglas will help you understand the implementation requirements to get the level of performance you defined as a requirement for each radio in the product. Implementation is the key factor when using off the shelf antennas. They must be used as designed or you risk getting much poorer performance than shown in the datasheet.

Taoglas will be available for further questions on the antenna integration as needed until the initial design files are done. Because of the wide variety of devices, use cases, and markets, Taoglas cannot advise on every aspect of design or development.

In particular, this service does not cover the following:

- Hands-on integration and test of antennas
- Review of electrical schematics
- PCB stack-up details
- RF filtering requirements
- Emissions or issue mitigation details
- Detailed electrical, RF, or antenna design
- Electromagnetic simulations

## What does Taoglas need?

This depends on where you are in the design. Hopefully you only have mechanical concept files at this point, either as industrial design drawings or 3D solid models. We need these documents to understand your desired project direction and to interactively work with you on various options. 3D PDF or eDrawing files for your mechanical assembly. We really do need the ability to hide parts, do cross sections, and make measurements, so an eDrawing with these features turned on is highly recommended. Taoglas will ONLY review electronic mechanical design files/models. Taoglas will NOT perform hands-on integration as part of this service. If you do have schematic, BOM, and layout files done, having these will help us understand your product implementation path. This will again help us better define the best antenna options and limit our implementation recommendations to what works with what you have so far. PDF format copies of your schematics for each board in the design. If you happen to use Altium then native Altium files would also be helpful.

**We will NOT review the schematics, but the schematics will assist Taoglas to better understand the product.**

PDFs of your PCB layout for each board, all layers. Again if you use Altium, then native Altium files would also be helpful. Please include a document defining the PCB stackup, layer thicknesses, materials, and finishes for the PCB.

A spreadsheet of your bill of material for each PCB in the design.

## Part 2

This effort is typically interactive, either a web meeting or an in-person meeting works best. After this meeting, Taoglas will provide an email of our understanding of the specifics and our recommendations. From this email your engineering team will have a direction for the antenna selections as well as an integration plan for each antenna in your product. Taoglas assumes your engineering team will then develop design files to implement the entire product. After the initial product design, Taoglas engineering will review the antenna layout to verify proper implementation. Taoglas offers a number of services, one of which would be review of those initial design files to optimize the radio performance and certification likelihood of your design.

These include:

- **ISA.20, ISA.21:** In-depth design review, including schematics, PCB layout, and mechanical integration – Can be implemented prior to prototype fabrication or following test failures
- **ISA.12:** transmission line design and review
- **CSA.20, ISM.10, ISA.50, or GSA.10:** antenna matching and passive testing

Visit [www.taoglas.com/solutions/design/](http://www.taoglas.com/solutions/design/) or contact Taoglas sales for further information.

## Deliverables

The email from the review meetings will include:

- A performance goal for each antenna in the system in terms of radiation pattern, directivity, efficiency, electrical interface, cost, and assembly or attachment method
- The recommended antenna solution for each radio in the system by part number
- A specific integration plan for each antenna in your product
- Following the antenna layout review, an email will be sent with recommendations and required changes