

# Interface Control Document Template

## XXXXXXXX (Sub detector name)

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<b>Summary</b>	
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## 1. INTRODUCTION

### 1.1. Scope of the document

Scope of the document.

**Note:** Unless otherwise stated, this document does not address software interfaces.

### 1.2. Applicable Documents (AD)

Applicable Documents (AD)			
AD	Title	Reference	Version

### 1.3. Reference Documents (RD)

Reference Documents (RD)			
RD	Title	Reference	Version

### 1.4. Details of change to the previous design

*Indicate (if it is necessary) the changes compared to the previous version of design.*

*Instruction: The reference for this first version is the DBD!!! Changes w.r.t. to the DBD will have to be justified. Keep ALARA (As Low As Reasonably Achievable).*

### 1.5. List of abbreviations

List of Abbreviations			
<b>MSE</b>	Mechanical System Equipment	<b>PW</b>	Power
<b>EL</b>	Electrical System Equipment		
<b>CB</b>	Cabling		

### 1.6. List and nomenclature of major parts

Non-exhaustive example for SiEcal

Nomenclature			
<b>Module</b>	Module	<b>Overlap</b>	Distance in z between barrel and end cap
<b>Stave</b>	Set of 5 modules covering an octant of the barrel	<b>Overshoot</b>	Amount by which the end cap outer radius exceeds the barrel outer radius.
<b>Slab</b>	Tungsten slab sandwiched between two detecting structures, to be slit in the stave.	<b>Alveoli layers</b>	
<b>Alveolus</b>	Hole in the module structure to contain a slab	<b>Alveoli columns</b>	

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## 2. GENERAL INTERFACE DESCRIPTION

General rule : **All dimensions are to be given in mm.**

## 3. MECHANICAL INTERFACE

### 3.1. Coordinate system

Assume that there will be convention and rules document that will define an ILD coordinate frame.

**Just a general rule: The +z axis will be close to the incoming e- beam.**

### 3.2. Mechanical concept

### 3.3. Critical dimensions

For every interfaced couple of systems a drawing with a functional dimensions and tolerances and if needed:

- Dimensions and tolerances
- Surface treatments and status
- Frame of reference axes
- attachment points: position, center distances, diameters, tolerances
- flatness
- position of the center of gravity (with tolerances)
- mounting specifications (torque, washers, brake type, heat seals, etc..)
- connectors (type, identification, position),
- location of the marking label.

### 3.4. Weights

Estimated weights with margin and tolerances

### 3.5. Positioning and alignment constrains

For every subsystem:

- Positioning constrains: position of q subsystem from another
- Alignment constrains: absolute/or relative alignment precision for a system from another  
AND requested precision for the verification of this alignment.

## 4. ELECTRICAL INTERFACE

### 4.1. Block diagram

It should indicate all electrical interfaces, including redundancies:

- power: the type of power (regulated, unregulated, heating), number of lines for each type;
- remote control: control type (relays, digital ...), the number of each type of control
- insulation;

Other interfaces: clock, other instruments, ...

### 4.2. Connection diagram

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This is a general wiring diagram showing the names of cables, connectors, equipment, ...

### 4.3. List of Connectors

For each connector on should indicate:

- The location (eg equipment A);
- the name of the connector;
- type (manufacturer's name + complete reference);
- the general function (eg power ...)
- coded pins, keying;
- the precise limits of the respective supplies;
- the principle of shield connections and grounding policy.

### 4.4. Cabling and connecting sheets

For every connector and every pin it will be specified:

- the signal type (analog, digital, power, RF, ...),
- the waveform (period, duty cycle, maximum value, minimum value)
- a graphical representation for complex signals (ramp, modulation ...),
- the category (transmitter or receiver)
- the reference of the pinning of the connector,
- the electrical diagram of the interfaced circuit.

### 4.5. Electrical Circuit of the grounding

A diagram will indicate how are connected or isolated mechanical grounds, shieldings ...  
The maximum contact resistance will be defined.

### 4.6. Power Consumption

For each functional mode and each line of power, the average power and peak power, combined with the current measurement, will be given.

### 4.7. Other electrical interfaces

This section defines all other electrical interfaces (clock s, other instruments ...).

## 5. FLUID INTERFACE (IF NEEDED)

For every fluid it will be indicated:

- the type of fluid;
- the reference of the mechanical interface to which it relates;
- the pressure;
- the temperature;
- the flow;

- the constraints of cleanliness of the fluid.

### **5.1. Gas system Interface**

### **5.2. Liquid system Interface**

## **6. THERMAL INTERFACE (IF NEEDED)**

For the subsystems:

- Limit temperatures: during storage, for switching power, in operation
- Thermal dissipation: in and out of operation

## **7. TEST INTERFACES**

These are the specific interfaces related to the test equipment:

- MSE interfaces: mechanical assembly test ... ;
- ESE interfaces: electrical interfaces with the test and verification systems;
- OSE interfaces: reference cubes, or targets for the surveys ...





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