

Production Activities at IFIC

**QAQC Workshop
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Involvement on Production Activities

Product development

- **Optical Beacons (OB)**
 - Well-controlled (pulsed) light sources for in-situ Time Calibration.
 - Two kind of sources:
 - Nanobeacons (intra-line calibration)
 - Laser Beacon (inter-line calibration)
- **Central Logic Board (CLB): firmware development of:**
 - Time to Digital Converters (TDC)
 - State Machine (time slice generator)
 - Central Logic Board re-configuration

Involvement on Production Activities

NanoBeacon

- Design and prototyping at IFIC:
- External supply of components: LEDs, electronic card, pulser.
- Production + Assembly by external companies
- Testing at external + IFIC (10 %)
- Testing also at the Integration site (DOM)

Involvement on Production Activities

Laser Beacon

- Design and prototyping at IFIC:
- Supply of components:
 - External: Laser, container, cables, electronic cards
 - Internal: mechanics
- Assembly and production at IFIC
(small number of products: 1 each 8-10 D.U)
- Testing at IFIC + external (special tests as hyperbaric chamber)

Involvement on Production Activities

Central Logic Board

- Contributions to the firmware: TDC, state-machine, re-configuration.
- First prototypes produced by external suppliers and supervised by IFIC + INFN Genova
- Testing of first prototypes: IFIC, Genova, Bologna, NIKHEF, ...
- Mass production by external companies.
- Testing at external + KM3NeT Labs (10%)

Local Existing Structure

Space:

- Two labs 30 m2 each

Equipment:

- Oscilloscope 4Ghz
- X-Ray machine for PCB inspection: soldering
- Fast PCB prototyping machine

Manpower:

- 2 Electronics Engineers
- Several trainees Degree students making an internship

Existing QAQC Documents

- KM3NeT-DS-CALI-09-001, Nanobeacon description
- “Technical Proposal for an Optical Beacon System to be included in the test NEMO Tower at Capo Passero”, October-2010.

Previous experience on Quality

Production Activities in ANTARES

- Optical Beacons, LED and Laser Beacons. Time calibration
- Compass cards and tiltmeters. Positioning

IFIC Quality Plan for ANTARES

- Task organization and responsibilities. Planning
- Documentation description: log-book, product sheets, non-conformities, record sheets, certificates of conformities, test reports, drawings, etc.
- Procedures for production, assembly,....
- Material: shipment, incoming and storage. Internal Data Base