

Equipment List for ATLAS Endcap module production - Glasgow

The equipment used at different points of the module production and test cycle are listed below under the appropriate fabrication/test heading.

Wire bonding

The wire bonding of modules will be performed in our clean area in the laboratory. The clean area has an anti-static floor covering.

2 x K&S 1470 ultrasonic wedge wirebonder
Nitrogen gas flow cabinets able to hold 50 modules
Leica microscope and stereo dynascope for visual inspection
PC for database access
Nitrogen gas bottles

Electrical testing

Two VME systems are at Glasgow to test modules. One is intended to perform multi-module testing of 6 modules at one time, the second is to perform acceptance tests on single modules. Each VME system is connected to a PC running the root based SCTDAQ software. Database interaction will be performed via these PCs.

The VME system consists of:

VME crate
SLOG
CLOAC II
MuSTARD
SCT-HV (2 in the multi-module system, 1 for the single module system)
SCT-LV (type 3 x 3 in the multi-module system, type 2 x 3 in the single module system)
AERO
6 Patch Cards
NI MXI-2-PCI VME interface card
PCI card
NI VME cable
PC

The electrical signals from the modules will be monitored using a LeCroy 9360 Oscilloscope.

The module temperature and humidity inside each testbox is monitored with PT1000 and humidity (Honeywell) sensors using DCS (see below).

For single module testing a Betta-Tech Controls Chiller is used to control the module temperature. The testbox is flushed with dry nitrogen. The multi-module tests are performed inside a commercial freezer. The freezer is instrumentated with PT1000 and humidity sensors. Module test boxes inside the freezer are connected to an external Betta-Tech Controls Chiller to maintain the correct module temperature.

Thermal cycling

The equipment required for thermal cycling is:
Design Environmental environmental chamber model: BS125-40
Valencia test boxes with modification to hold module test frame away from the module.
DCS (see below)

Laser Scanning

A PC controlled x-y stage and laser source is used in conjunction with the DSP/BC96 hardware to scan ATLAS modules to check bonding programs. Hardware used is:

VME crate
BC 96
DSP
SEQSI
HP 81110A pulse generator
NIM crate
NIM HV card
Laser source + driver (CERN – Maurice Glaser)
Optical fibres
OWIS x-y stepper motor and controller
GPIB card to drive stepper motor
Bench power supply
NI PCI-2-MXI interface card
NI PCI card
NI cables
LeCroy 9344 Oscilloscope

DCS

The temperature and humidity of the test boxes and environment is monitored using PT1000 and Honeywell humidity sensors. These are monitored via the ATLAS DCS system using a PC controlled SCADA system which includes CANbus and two ELMBs. Gas flow to the test environments are controlled using the DCS system and EL-FLOW mass flow controller (Bronkhorst Hi-Tec). 3 x bench power supplies are used to power system.

Ancillary Equipment

The laboratory has many other pieces of equipment that can be used during the ATLAS Endcap module production if required, these include:

Keithley 237 SMU
Karl Suss manual Probe station