



PRODUCT CATALOGUE

INSTRUMENTS FOR DETECTION



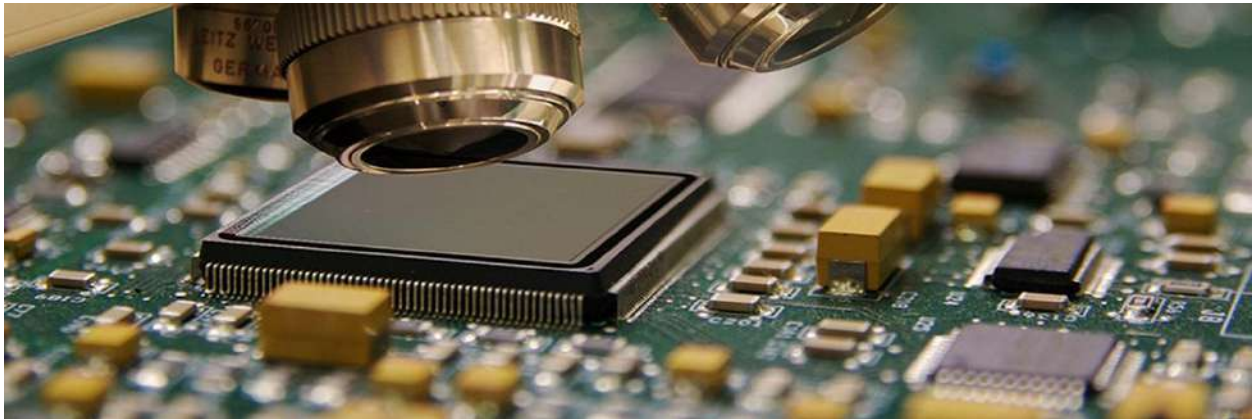
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ALIBAVA SYSTEMS

Our mission is to provide technological products and services to the High Energy and Nuclear Physics research community from readout and characterization electronics, to radiation detector development and fabrication, custom engineering services and full mechanical electronic system integration.



Some products are sold under license of Spanish National Research Council (CSIC) and University of Valencia (Spain)



ALIBAVA SYSTEM CLASSIC

Alibava Systems is a portable particle detector readout system for scientific, academic or industrial usages. This system uses a front-end readout ASIC (the Beetle chip) to characterise microstrip detectors. The Beetle chip was successfully developed for one of the CERN LHC experiments. The system is suitable to analyse the properties of irradiated and un-irradiated microstrip detectors.

The system hardware has two main parts:

- Mother Board: intended to process the analogue data that comes from the readout chips and external trigger signals, to control the whole system and to communicate with a PC via USB.
- Daughter Board: hosting the readout chips, pitch adaptors (fan-ins) and the detector, located on a detector board.

There is a provision for an external trigger input (a silicon trigger board is available) and a 'synchronised' trigger output for pulsing an external excitation source (e.g. laser system). The system can operate with different types and different sizes of microstrip detectors: n-type (holes readout), p-type (electrons readout).

Different flavours of daughter boards and detector boards are available to accommodate detectors of different sizes. The system is designed to work with either radioactive sources or laser.

The system is provided with a user-friendly software package for Linux, Windows and Mac iOS operating systems.

Data acquired with the system can be easily processed using ROOT framework with macros already developed.



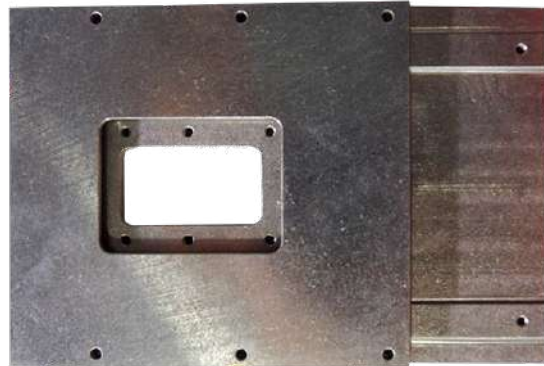
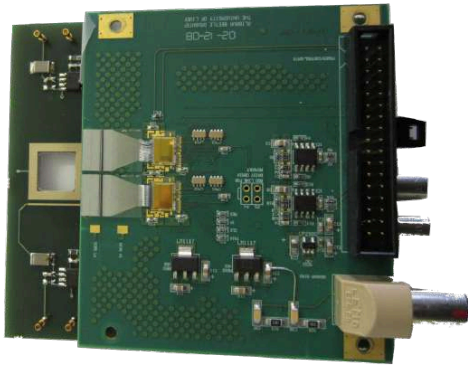
ALIBAVA SYSTEM CLASSIC

The complete system contains:

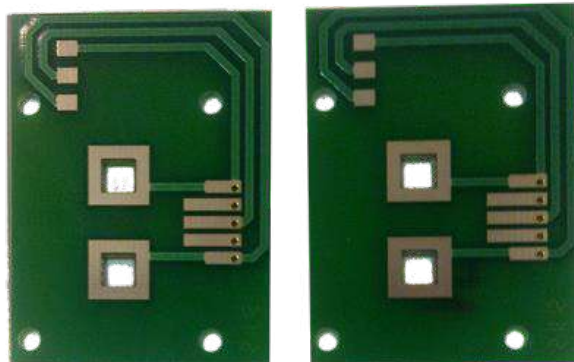
- 1 Populated Mother Board with box



- 1 Populated Daughter Board with fanins (2 fan_chip + 2 fan_det_80-80) with box



- 2 detector boards





ALIBAVA SYSTEM CLASSIC

- 6 extra fanins (fan det 80-80)



- 1 power supply (AC/DC adaptor)



- 1 USB cable and 1 flat cable



- 2 LEMO connectors for detector power cable



- Software copy and Documentation (to be downloaded from web page)

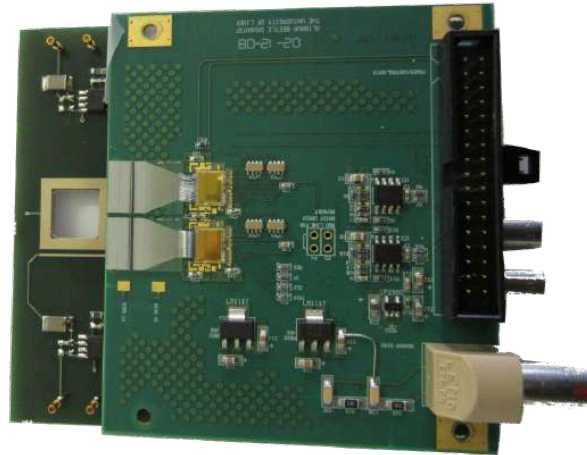




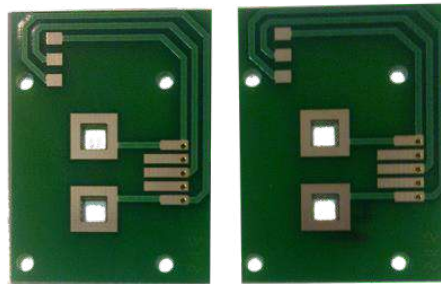
ALIBAVA SYSTEM CLASSIC

Standard Daughter Board is shipped with:

- 1 Populated Daughter Board with fanins (2 fan_chip + 2 fan_det_80-80)



- 2 detector boards



- 6 extra fanins (fan_det_80-80)



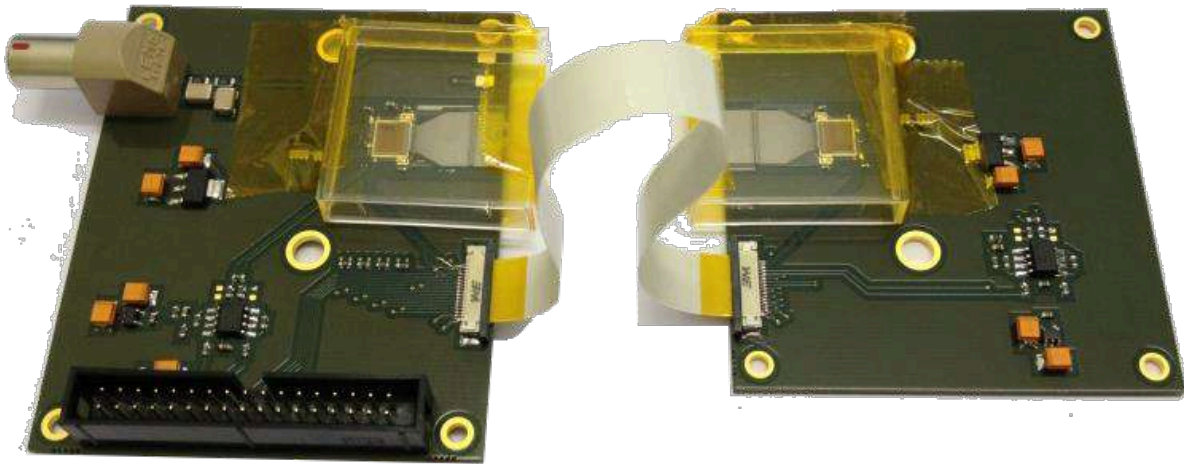
- Custom detector boards are provided under demand



CUSTOM DAUGHTER BOARDS

- Custom design of the Daughter Board
- Pitch adapters available on request
- Different geometries of the sensors
- Double-sided sensors
- Multi-chip board for a larger number of channels
- Wire-bonding or high-density connectors

Tell us your specific needs and we will provide a solution.



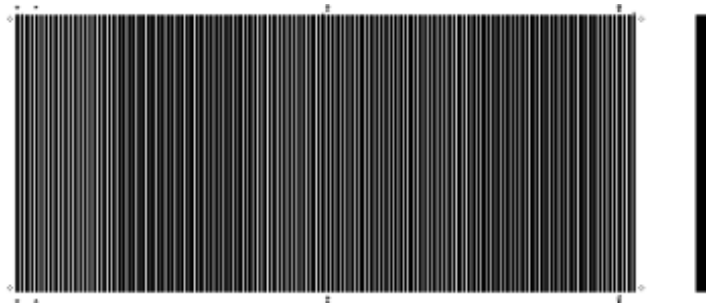


STANDARD PITCH ADAPTERS (FAN-INS)

Pitch Adapters, also called fan-ins, are used to adapt the pitch of the daughter board to different sensors and to allow the wiring of different detectors (ideally up to 500) using the same board. We have two types of detector fan-ins in stock.

Pack of 10 fan_det_80-80 (standard fanin)

- External dimensions: ~ 11800 x 5000 μm , thickness: 300 μm
- Number of tracks: 128 + 1 bias line
- Track pitch: 80 μm
- Track width: 50 μm
- Track separation: 30 μm
- Bias line: 250 μm thick, separated 1000 μm from the rest of the tracks



fan_det_80-80





STANDARD PITCH ADAPTERS (FAN-INS)

Pack of 6 fan_det_80-50

- External dimensions: ~ 11800 x 10000 μm , thickness: 300 μm
- Number of tracks: 128 + 1 bias line
- Right side: 2 rows of pads (50 μm wide) in staggered configuration repeated 15 times for multiple bonding
- Track (and pad) pitch: left side: 80 μm ; right side: 50 μm
- Track width: left side: 50 μm ; right side: 20 μm
- Track separation: 30 μm
- Bias line: 250 μm thick, separated 1000 μm from the rest of the tracks



fan_det_80-50



CUSTOM PITCH ADAPTERS (PA)

We can fabricate full custom pitch adapters under demand. The primary option is to produce a full Engineering Run exclusive for one customer.

The minimum order is 10 full wafers. The guaranteed minimum fabrication yield is:

- 70% minimum for area $\leq 200 \text{ mm}^2$,
- 50% minimum for $200 \text{ mm}^2 < \text{area} \leq 400 \text{ mm}^2$
- No minimum guaranteed for area $> 400 \text{ mm}^2$

In all cases, all good PAs will be delivered on top of the minimum guaranteed yield.



MULTI-PROJECT WAFER PITCH ADAPTERS

We have started a Multi-Project Wafer (MPW) Runs of Full-Custom Pitch Adapters to allow the acquisition at a reasonable cost of small quantities of custom fan-ins. The main characteristics are:

Multi-Project Wafer (MPW) Runs

- Several PA designs in a single wafer mask
- One batch
- Sharing costs among many users for small series

Quantities

- 20, 50, 120 units
- Extra orders 40% reduction (if available)

Passivated or not passivated

- Most cases (experiments, prototyping) do not need passivation

Standard: 0-defects, Untested: (20% reduction)

- Most users do not need 0-defects



MULTI-PROJECT WAFER PITCH ADAPTERS

Design rules

- Maximum die area: ~500 mm²
- Minimum area: 100 mm²
- Maximum side length: 50 mm
- Minimum feature size: 10 μm
- Minimum separation: 10 μm
- Design review
- Rectangular cut
- Minimum space between last feature and cut line: 200 μm

(Some exceptions may apply, please contact us if you need to break some of the rules)

Design options

- The customer submits full GDS design (according to design rules).
- The customer submits design in gerber or another format.
- The customer describes needs and we provide Full Custom design (Customer final design approval required in last 2 cases)

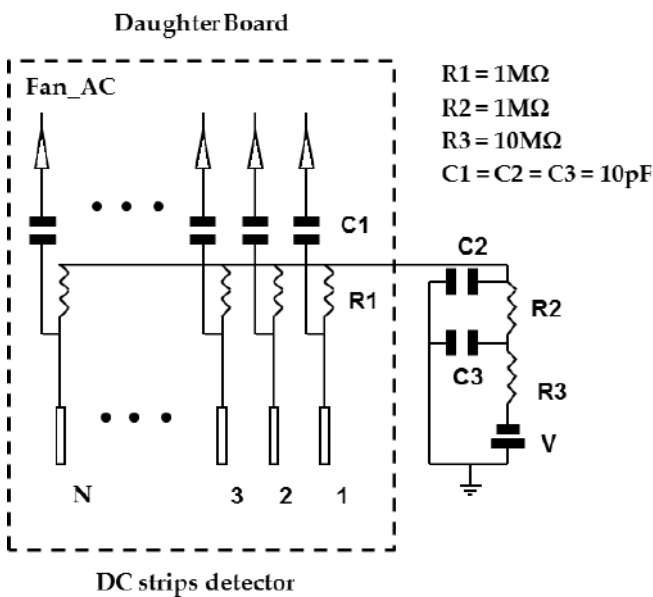
Schedule

- Runs scheduled when enough participants
- Total fabrication time (mask, cleanroom fabrication, test & cut): 3 months



AC COUPLED PITCH ADAPTERS

AC coupled pitch adapters or AC fanins, are used to measure DC-coupled detectors of different kinds with the standard ALIBAVA Daughter Board. They include the AC coupling capacitors and the bias polysilicon resistors for every channel. A general application scheme (top) and a cross-section (right) can be seen below.

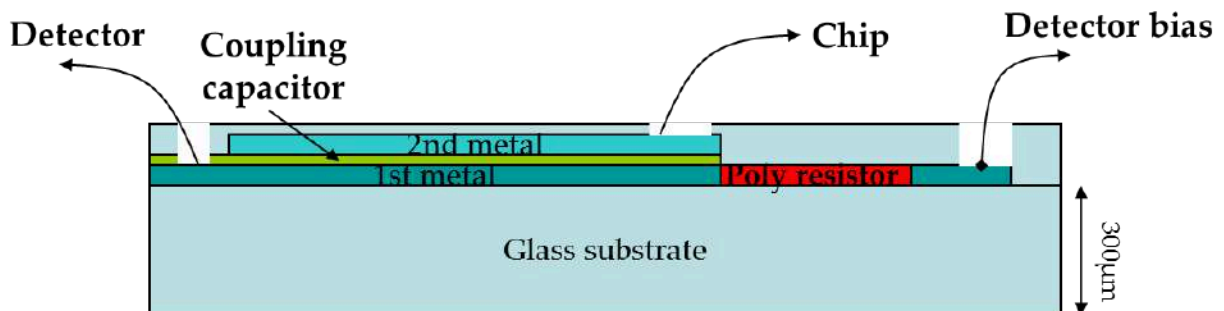


- Integrated AC coupling capacitors:

Thickness = 200 nm
Area = $4500 \times 50 \mu m^2$
Capacitance = 40 pF

- Integrated bias resistors:

Resistance = 1 M Ω

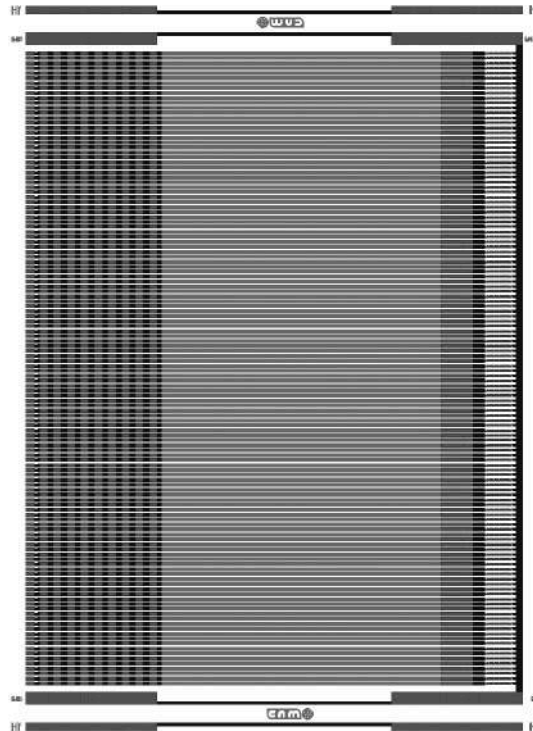




AC COUPLED PITCH ADAPTERS

Pack of 6 fan_AC

- External dimensions: $\sim 11900 \times 8900 \mu\text{m}$, thickness: $300 \mu\text{m}$
- Number of tracks: $128 + 2$ bias lines
- Track (and pad) pitch: $80 \mu\text{m}$ at both sides
- Track width: $54 \mu\text{m}$
- Track separation: $26 \mu\text{m}$
- Bias lines: $50 \mu\text{m}$ thick, separated: first-line (GND): $260 \mu\text{m}$ from the rest of the tracks; second line (HV): $300 \mu\text{m}$ from the first bias line.



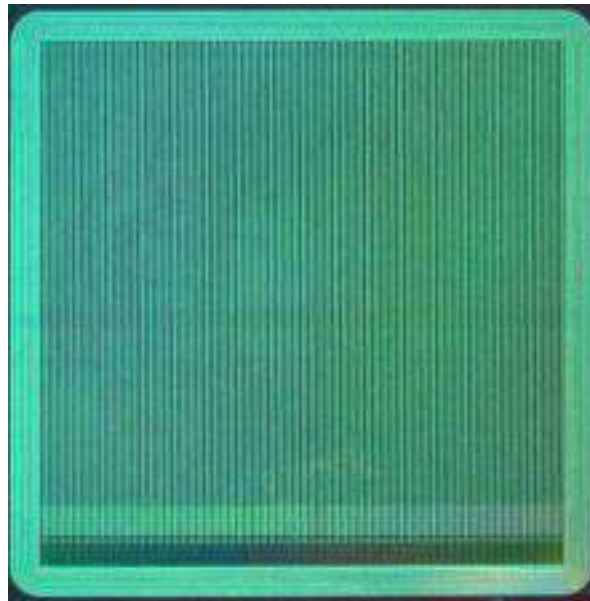
fan_AC



DETECTOR SET

The system is delivered without any detector, but on demand, we can provide with standard detector set:

- 2 "Baby" P-on-N microstrip (128 channels) particle detector ($1 \times 1 \text{ cm}^2$)
- 1 detector board



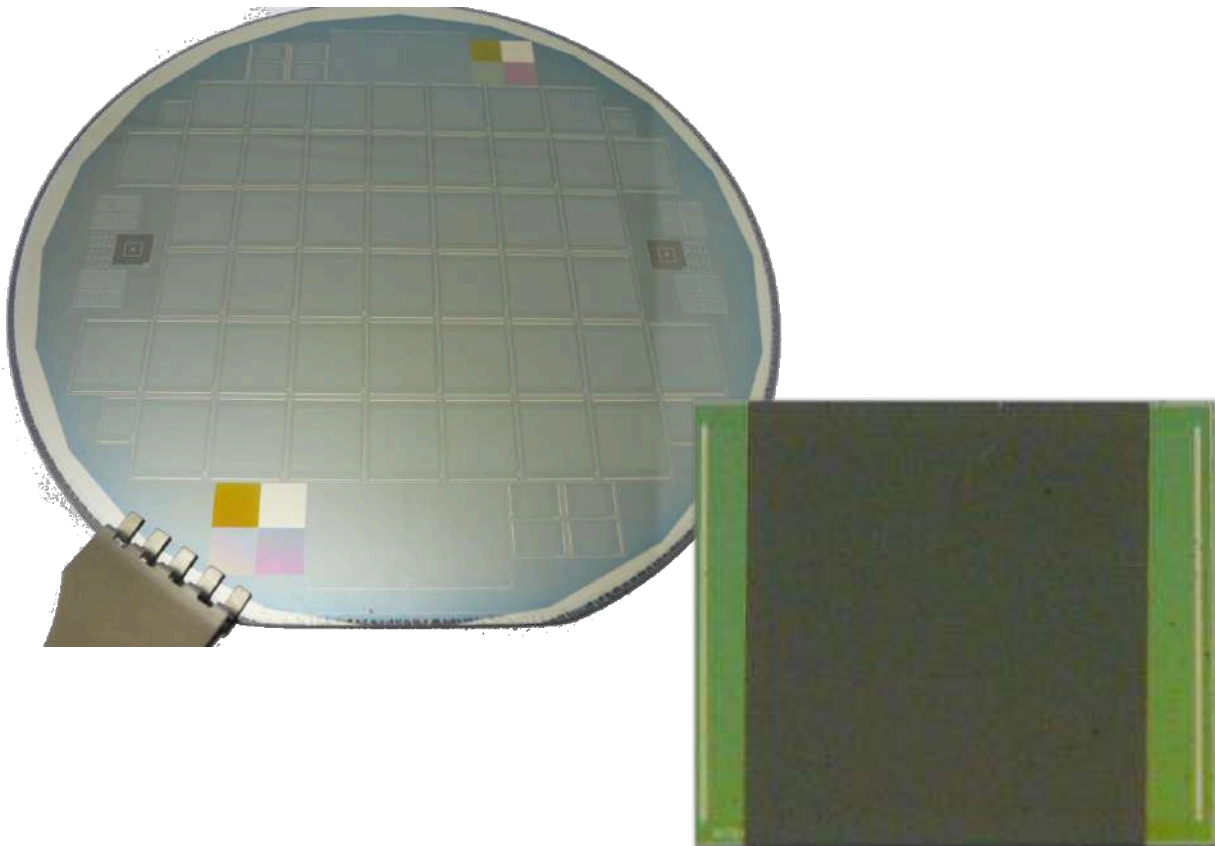
Optional mounting and wire bonding of the detectors and fanins. Other types and sizes of detectors can be provided under request.



NEUTRON DETECTORS

As an option, we can provide detectors for the Alibava system that are sensitive to thermal neutrons.

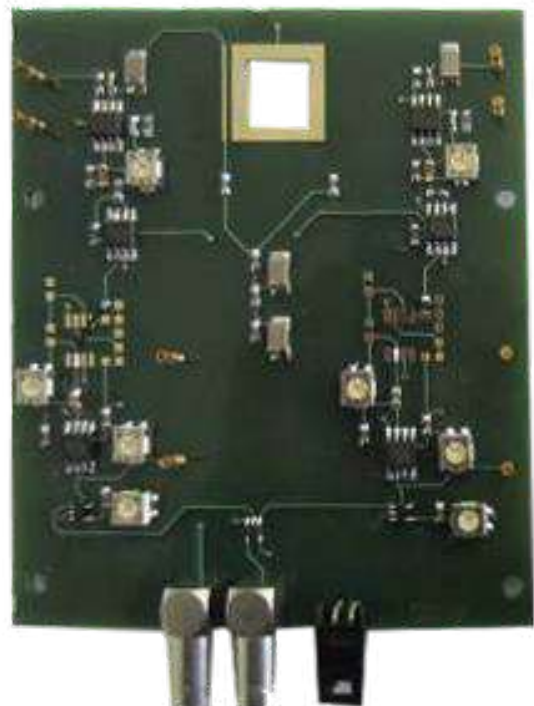
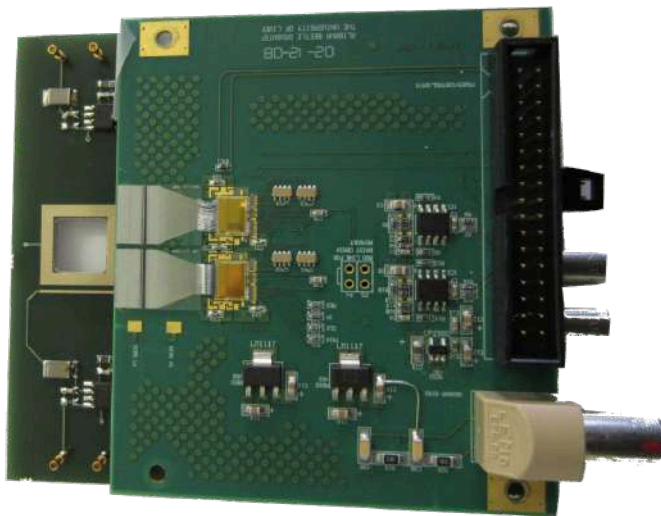
- Based on silicon detectors with neutron converter
- Thick layers of pure Boron-10 deposited
- Boron-10 deposition at device or wafer level with hard mask or photolithography
- Different geometries and technologies of the sensors (pad, strip, pixel, planar, micromachined) are offered
- Custom design to suit your needs





TRIGGER CARD

- Based on silicon diode sensors
- One or two diode coincidence triggers
- Includes coincidence logic and threshold adjustment
- High rate (20 KHz)
- Inputs: 5V and sensor bias (20-30V)
- Output: TTL Trigger pulse
- Compatible with Alibava MB input to start data acquisition
- Assembly matching with Alibava DB
- Custom design available on request



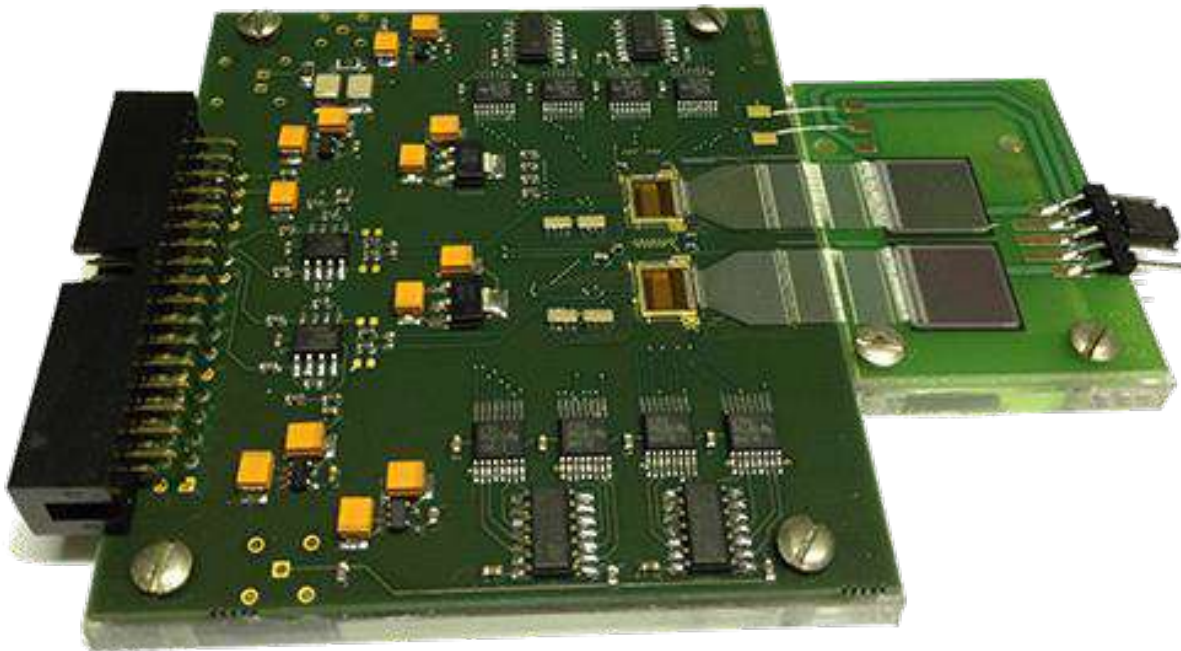


AUTOTRIGGER DAUGHTER BOARDS

- Self trigger generated by the beetle chip
- Custom design
- Pitch adapters available on request
- Different geometries of the sensors
- Double-sided sensors

Applications

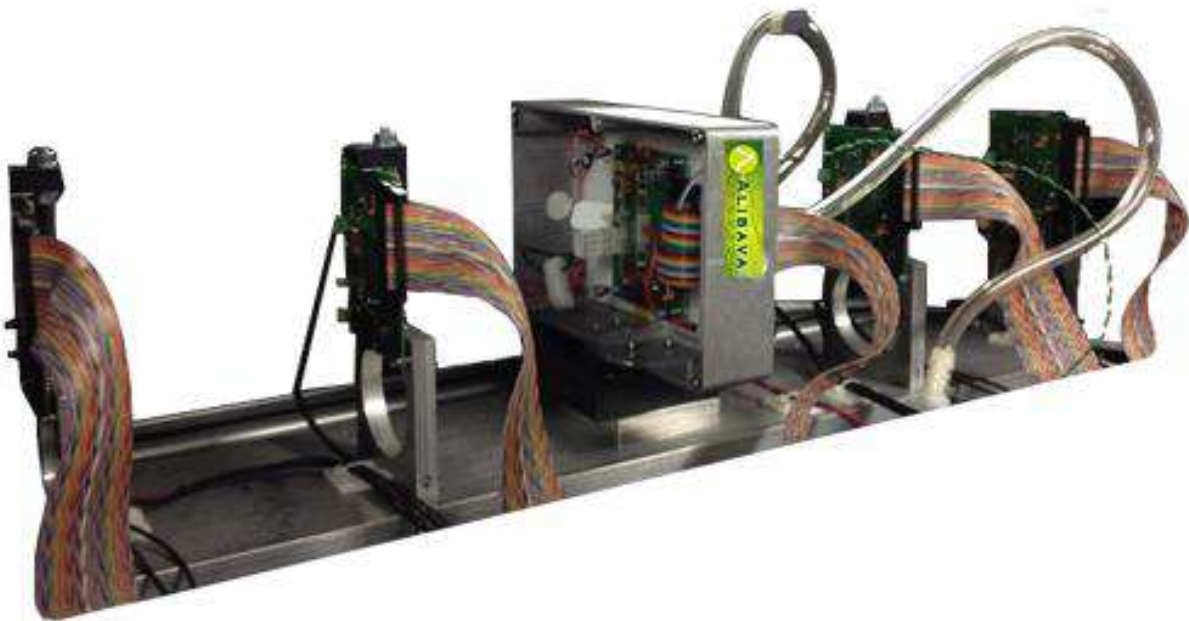
- Photon detection
- Nuclear physics
- Neutron detection (with suitable conversion layer)





COMPACT TRACKER TELESCOPE

- Compact telescope for tracking high energy particles with fine resolution.
- Up to 16 planes (more can be provided on request) for x-y positioning.
- Based on Alibava boards with synchronous readout.
- Standard 1x1 cm² silicon microstrip detectors at each station (different sizes and shapes can be provided on request).
- High trigger rate capability.
- Full configuration and analysis software provided.



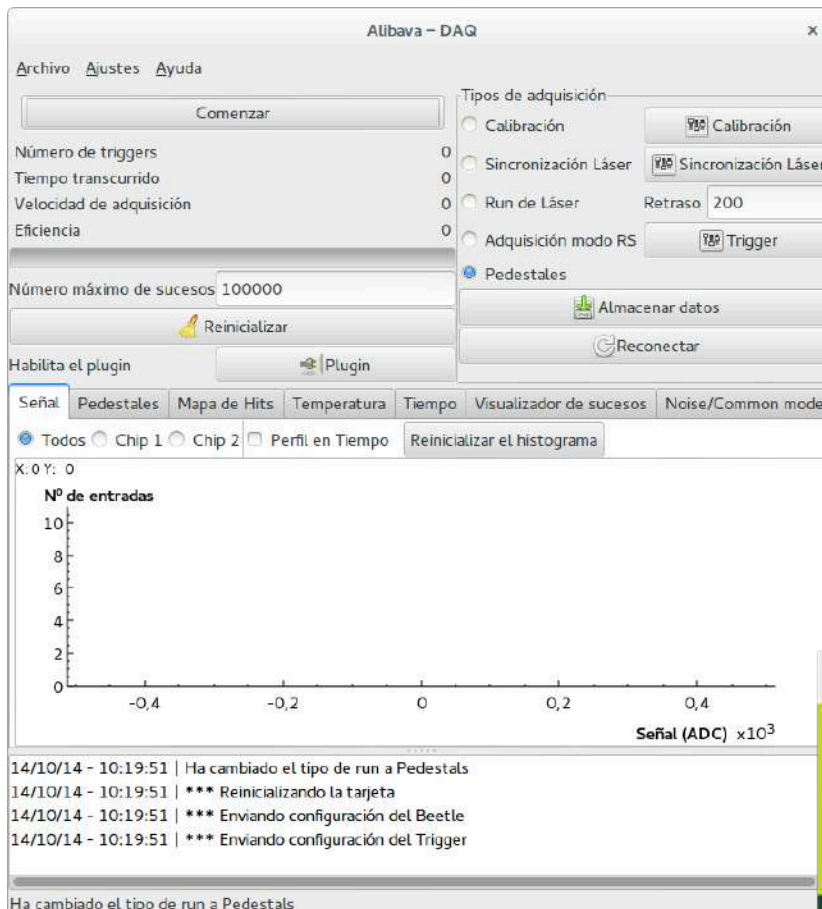


SYSTEM & ANALYSIS SOFTWARE

Alibava Software is an easy to use graphic interface to control all the features of the system. There are versions for:

- Linux
- Windows
- Mac iOS

Copies of the software for other operating systems or new versions are provided free of charge.





EDUCATIONAL ALIBAVA SYSTEM (EASy)

- Complete instrumentation system dedicated to Silicon Microstrip Radiation Detectors, representing the state-of-the-art in detector characterization.
- Based on the Alibava System largely used within the CERN community to test microstrip detectors for particle and nuclear physics experiments.
- The system can be configured to work with laser light or radioactive sources.
- The set-up is ideal for making basic or complex experiments with silicon microstrip detectors similar to the ones performed in the actual research field, in facilities like CERN (LHC), DESY, FERMILAB, Synchrotrons, etc.
- This simple electronic equipment establishes the basis for an affordable and complete set of student laboratory experiments.

The complete system contains:

- Alibava board



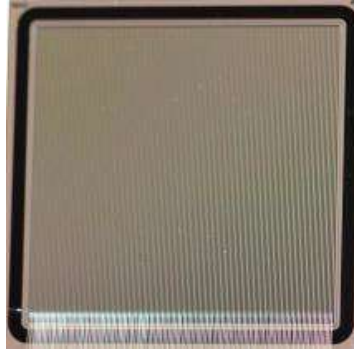
- Detector board





EDUCATIONAL ALIBAVA SYSTEM (EASy)

- Microstrip Silicon Detector



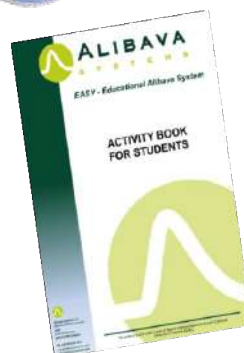
- Laser source, 1 USB cable and 1 flat cable



- Acquisition software



- User's manual and Exercises book





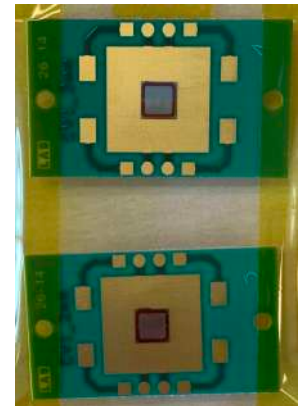
BEAM INTENSITY AND POSITION MONITOR

Silicon transmission photodiode with very low absorption $< 15\%$ at 8 keV and very high efficiency, the photons you loss at least count.:



Single and 4 quadrants systems to perform intensity and position measurements. Vacuum (KF 40), Standard (light shielded housing) and Naked (custom integration) configurations.

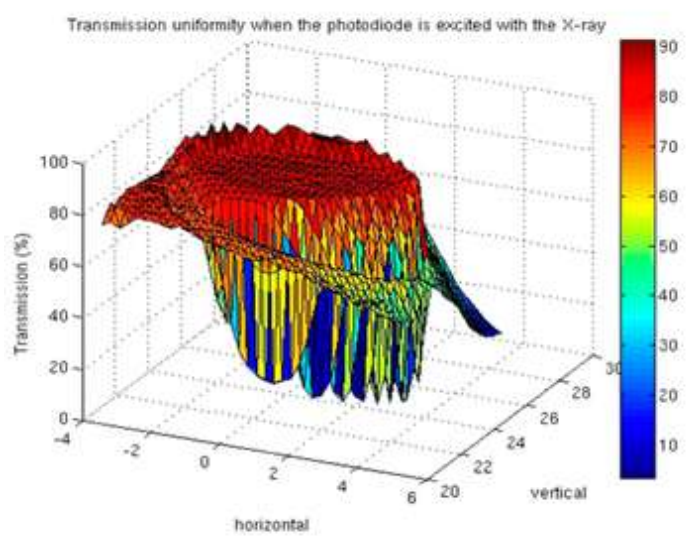
Alibava Beam Intensity Monitor is a small, easy to install and passive photodiode circuit for X-ray beam diagnostic applications. This solution provides actual X-ray beam intensity data through direct measurement. Furthermore, its transmission properties allow the online monitoring of the most critical beam parameter simultaneously with the data acquisition during an experiment.



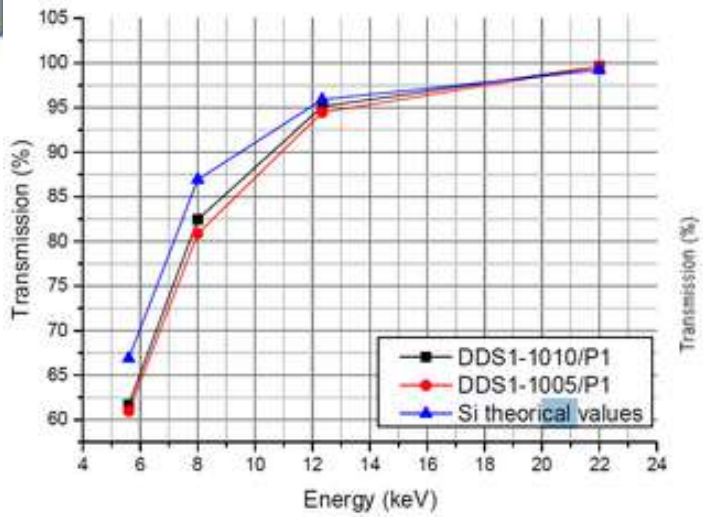
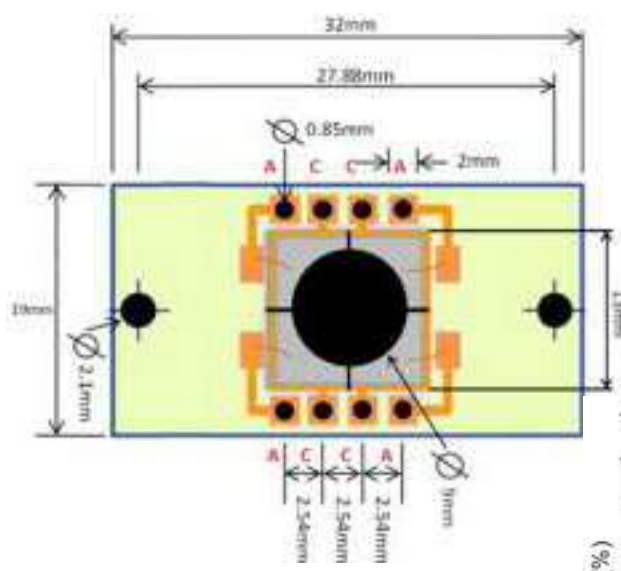
This valuable characteristic is achieved through its innovative thin detector with a very high X-ray transmission, good responsivity uniformity, stable, low absorption and uniform radiation stability.

Was developed in collaboration with ALBA Synchrotron. Thanks to its unique characteristics Alibava Beam Intensity Monitor is especially useful not only for beamlines characterization in synchrotrons but also for quality control of monochromatic X-ray machinery.

- P-on-N silicon detector
- Size: 5x5 mm² or 10x10 mm²
- Thickness: 10 μm
- No external voltage needed
- Dimensions: 41x68x12 mm³
- Easily mounted in experiment
- The beam intensity is measured by output current
- Depletion layer thickness (bias = 0): 7 μm



Wide energy range. Transmission level above 80% at 8keV and 94% at 12keV.
 Responsivity uniformity better than 5% inside the active area.





ALIVATA SYSTEM

AliVata System is a portable and compact readout system for silicon sensor characterization.

AliVata is based on the GPn and HDRn ASIC families of IDEAS and enables the user to read out or characterize each individual volume of silicon micro-dosimeters, silicon strip or pad sensors as well as SiPM based detector systems.



- 1 keV energy resolution
- Peaking time depends on the ASIC : 50 ns (fast) 500 ns (slow) for the GP7
- Up to 4 data streams with a max. of 16 chips on each of the streams
- Connectivity PC by UDP (Ethernet)
- TDC resolution better than 100ps
- Autotrigger
- External trigger
- Voltage supply: +5 V
- Data Acquisition Software for Windows, Linux and Mac OSX



PICOAMMETER

Especially suited for applications where multi-channel fast acquisition is a concern, i.e. feedback systems.

This device performs current measurement from ± 2.5 nA (with a resolution of 298 aA) up to ± 11 mA (resolution of 1.35 nA) with sampling frequencies of up to 26 kHz (for 1 channel and a 16-bit resolution) and 6.5 kHz (4 channels, 16 bit/sample).

- Housed in a light and extremely compact box
- Low temperature drifts, good linearity, and very low noise
- Buffered voltage monitors that are proportional to the measured input current
- High voltage (30 V) output





PICOAMMETER

Benefit

- Extremely low current measurements
- Bipolar current measurements
- Can be placed close to the signal sources in order to reduce cable lengths and minimize possible noise pick-up
- High-precision current measurements
- Allows the user to freely select the type of communication interface, allowing control of the instrument with different types of programming languages and/or operating systems
- Allows direct analogue monitoring on the oscilloscope
- Detector biasing

Applications

- Ultra-low current measurements
- Beam position monitoring
- Si and Diamond detectors readout
- Ion chamber readout



CONTACT US



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Location

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