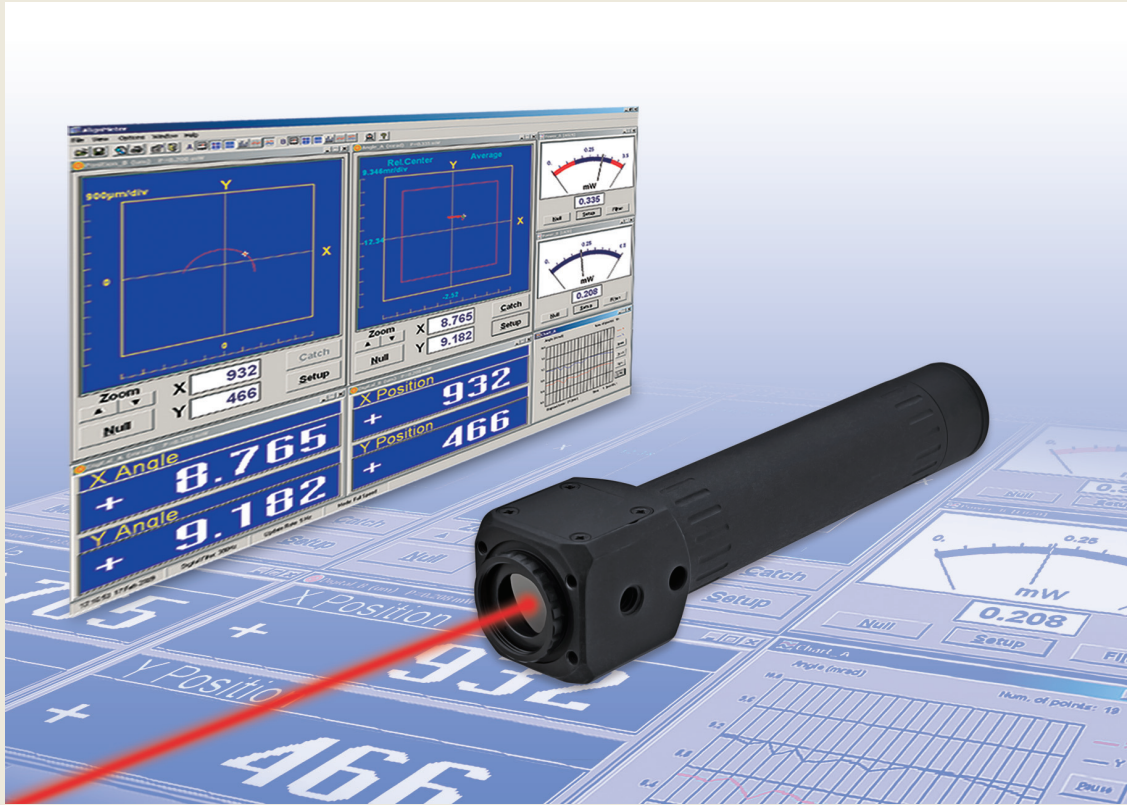


# AlignMeter USB

*Simultaneous measurements of position and angular displacements*



*A portable, fast and accurate beam alignment system*

- **Versatile:** Measures both Beam Position (over area up to 9mm diameter), Angle (up to 180 mRad) and Power (from 10  $\mu$ W to 5 mW without filters)
- **Precise:** Down to 0.1  $\mu$ m resolution & 50 Hz digital filter,  $\pm 15 \mu$ m absolute accuracy for the Position sensor, and down to 0.005 mRad resolution,  $\pm 0.125$  mRad accuracy for the Angle sensor
- **Convenient:** USB2.0 interface, detectors and software work with any Notebook/Desktop under Win XP/7 (32 & 64 bit)
- **Easy to use:** User-friendly software, complete on-line Help routine

## Key Features

- Power input through USB2.0 port
- New hardware having 24 bit A/D
- Convenient automatic Gain setting
- Simultaneous operation of Position and Angle sensors
- ActiveX package for integration in user application program
- Multiple device operation available
- Data streaming via RS232, direct data logging to Excel files
- Real time display of Position, Angle and Power measurements



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# Measurement Specifications

Each AlignMeter head is composed of two PSD's, beam splitter and lens assembly.

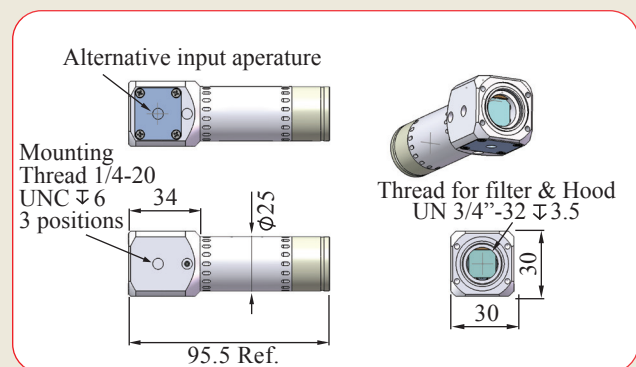
|                                   |                                                                                                                               |                                                                                                                               |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>PSD size (two optionals)</b>   | 9mmX9mm                                                                                                                       | 4mmX4mm                                                                                                                       |
| <b>Type</b>                       | Dual-axis Si resin, no glass cover                                                                                            | Dual-axis Si resin, no glass cover                                                                                            |
| <b>Usable beam size range</b>     | 50µm to Ø8mm                                                                                                                  | 50µm to Ø3mm                                                                                                                  |
| <b>Update rate</b>                | Max 150 Hz at 500 Hz digital filter                                                                                           | Max 150 Hz at 500 Hz digital filter                                                                                           |
| <b>Spectral range</b>             | 350 – 1100nm                                                                                                                  | 350 – 1100nm                                                                                                                  |
| <b>Position measurement range</b> | 8mm diameter circle max. centered on the PSD                                                                                  | 3mm diameter circle max. centered on the PSD                                                                                  |
| <b>Power range</b>                | 10 µW – 10 mW with attenuating ND filters                                                                                     | 10 µW – 10 mW with attenuating ND filters                                                                                     |
| <b>Power accuracy (*)</b>         | ±5%                                                                                                                           | ±5%                                                                                                                           |
| <b>Lens type</b>                  | Plano convex achromat, A/R coated                                                                                             | Plano convex achromat, A/R coated                                                                                             |
| <b>Beam splitter</b>              | 50:50 A:R coated, non-polarized                                                                                               | 50:50 A:R coated, non-polarized                                                                                               |
| <b>Temperature range</b>          | 0°C to 35°C                                                                                                                   | 0°C to 35°C                                                                                                                   |
| <b>Optional accessories</b>       | ND filters (See Optional Accessories on page 4)<br>Hood for ambient light obstruction<br>(See Optional Accessories on page 4) | ND filters (See Optional Accessories on page 4)<br>Hood for ambient light obstruction<br>(See Optional Accessories on page 4) |

(\*) To maintain full calibration accuracy, attenuating optical filters (ND) may be necessary for operation with beams greater than 1 mW per PSD (the total of 2.5mW per assembled head. Saturating "non-linear" effects depend on the beam size, type and wavelength.

There are 2 main models with variation in lens focal length:



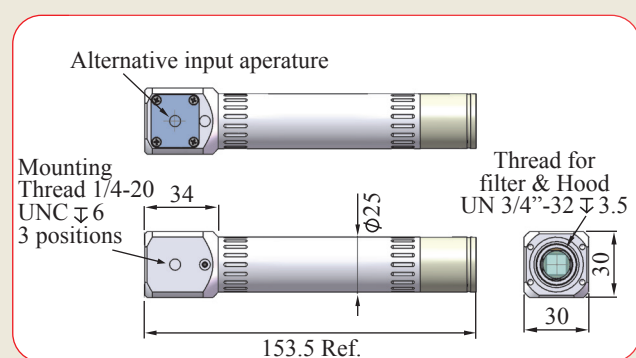
## AlignMeter-50



|                                |                                                          |
|--------------------------------|----------------------------------------------------------|
| <b>Lens focal length</b>       | 50mm                                                     |
| <b>Position resolution</b>     | Down to 0.1 µm at 50 Hz digital filter with averaging on |
| <b>Position accuracy</b>       | ±15 µm edge-to-edge (±8 µm)                              |
| <b>Angle measurement range</b> | 180 mRad (90 mRad)                                       |
| <b>Angle resolution</b>        | 0.02 mRad (0.01 mRad)                                    |
| <b>Angle accuracy</b>          | 0.5 mRad edge-to-edge (0.3 mRad)                         |
| <b>Weight</b>                  | 140gr. Excluding cables                                  |



## AlignMeter-100 (Standard configuration)

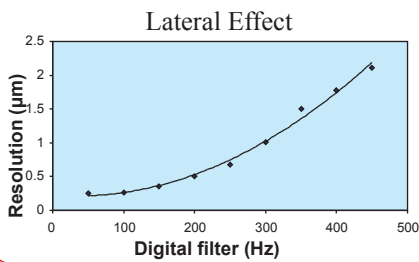


|                                |                                                          |
|--------------------------------|----------------------------------------------------------|
| <b>Lens focal length</b>       | 100mm                                                    |
| <b>Position resolution</b>     | Down to 0.1 µm at 50 Hz digital filter with averaging on |
| <b>Position accuracy</b>       | ±15 µm edge-to-edge (±8 µm)                              |
| <b>Angle measurement range</b> | 80 mRad (40 mRad)                                        |
| <b>Angle resolution</b>        | 0.01 mRad (0.006 mRad)                                   |
| <b>Angle accuracy</b>          | 0.25 mRad edge-to-edge (0.15 mRad)                       |
| <b>Weight</b>                  | 180gr. Excluding cables                                  |

**Note:** All values (in parentheses) refer to 4x4 mm PSD version

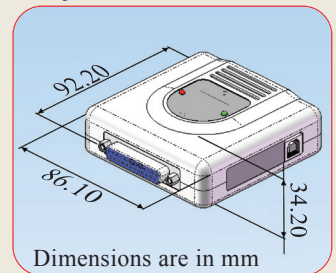
# Measurement Specifications - Cont.

## Bandwidth Vs. Resolution



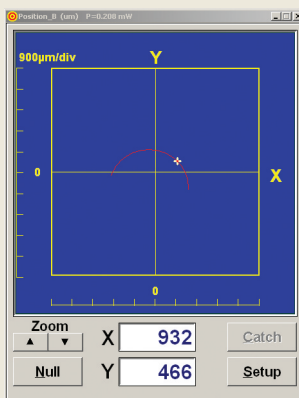
The digital filter controls the bandwidth of the detector's response, where lower digital filter attenuates the system noise and increases system's resolution. Change digital filter via Position Setup, Hardware Tab, Digital Filter function.

## Manifold Box dimensions



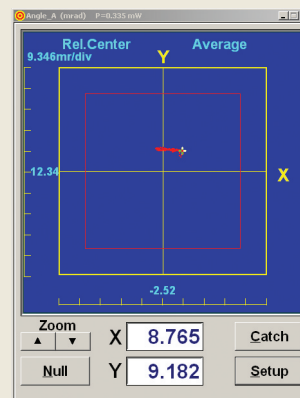
# Software Presentations

## Position



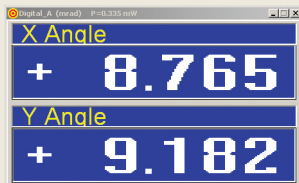
Real time display of X,Y beam centroid.  
Main features: set relative center, perform zooming, alarm setting, average.

## Angle



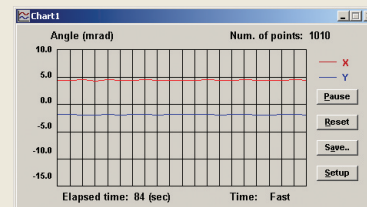
Real time measurements of beam angular deviations.  
Main features: set relative center, perform zooming, alarm setting, average.

## Digital



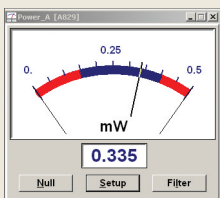
Display position or angle as large digits easily seen from a long work distance.

## Chart



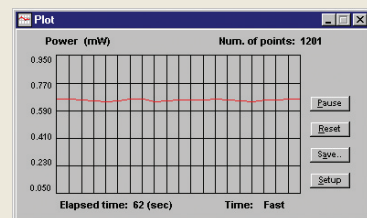
Display changes in the X,Y position, or in the X,Y angle versus time, with autoscaling and saving options.

## Power



Display power with analog and digital displays.  
Main Features: change measuring units, load a filter file, perform ambient light suppression. Power is displayed for each PSD.

## Power Plot



Display changes in Power versus time, for the Position sensor or for the Angle sensor, with autoscaling and saving options.

# Main Software Features

- Real time display of Position, Angle and Power
- Simultaneous presentations of Position, Power, Plot and Chart modes
- Data streaming via RS232 or TCP/IP
- Multiple systems operation
- Direct data logging to Excel files



# Main Applications



## 1. Alignment monitoring

Using the AlignMeter system it is possible to test the drift, centration, alignment of the beam relative to the outer housing or tube. The beam power fluctuations are also monitored. Using the Position and Angle screens simultaneously it is easy to track the beam, while the Chart functions record and save the characteristics over time.

## 3. Alignment of articulated arms

## 4. Alignment of lasers and laser tubes

## 5. Alignment of laser systems for wafer inspection



## 2. Examining errors in slideways

The AlignMeter can measure tolerances and errors in mechanical devices with high precision. An AlignMeter head is rigidly mounted perpendicular to a traveling carriage, and a laser is aligned towards the detector to define a straight optical path. As the carriage moves along the slideways the AlignMeter measures changes in beam position and angle in two axes perpendicular to the direction of motion. Any changes in the position and angle readings will indicate deformities in the rails, play in the bearings, or both.



# Hardware Requirements

Pentium 4, 2.4GHz and above with 512MB RAM, 15MB HDD free, one CD ROM, VGA 8MB 1024X768 resolution, 16 bit, one USB2.0 socket, Windows XP/7



# Ordering Information

Complete system including a manifold box, USB2.0 cable, measuring head, software and user manual on CD, carrying case.

**ALIGN-USB-50 :** Measuring head with focal length f=50mm

**ALIGN-USB-100:** Measuring head with focal length f=100mm (Standard configuration)



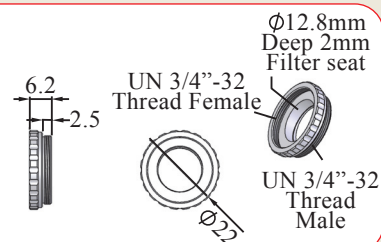
# Optional Accessories

**ALIGN-FLT-NG4 :** NG4 filter in housing

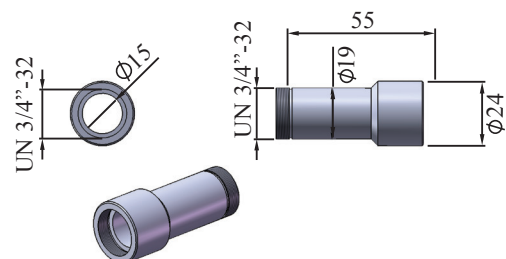
**ALIGN-FLT-NG9 :** NG9 filter in housing

**ALIGN-FLT-NG10 :** NG10 filter in housing

**ALIGN-Hood :** 55mm long, for ambient light suppression



**Filter**



**Hood**



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