

# PDA System with Receiving Optic and Controller

## Overview

The ILA R&D PDA System is easy to use and can simultaneously measure the velocity and the size of particles in fluid dynamics applications. No laser is included in the PDA Receiving Optic itself. An additional LDV Probe is therefore required for operation. Since particle size determination does not require a calibration factor, the accuracy is maintained and the LDV Probe does not need to be recalibrated.

The PDA Receiving Optic and the LDV Probe are arranged at a fixed angle to each other (see example measuring setup in Fig. 2), on which the phase to diameter factors for the particle size determination depend. This has a direct impact on the measurement accuracy. The light scattered by the particles inside the measuring volume is collected forwards, under the fixed angle, by the receiving lens of the PDA Receiving Optic. For the calculation of the particle sizes, a factor must be known. This factor depends on the focal lengths of the transmitting and receiving optics, the laser frequency, the angle of intersection of the laser beams and the refractive index of the particles.

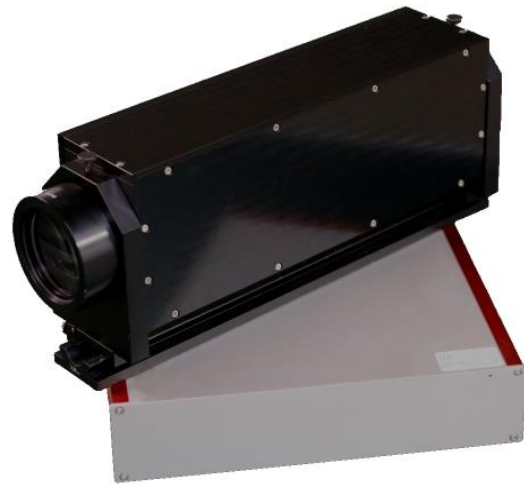


Fig. 1: PDA Receiving Optic on PDA Controller

Different working distances for the PDA Receiving Optic are possible by using receiving lenses of different focal length. The receiving lens is therefore mounted in a holder, which can be easily interchanged. However, this changes the viewing angle of the photo-detectors and thus the phase difference and with it the possible particle size ranges for a measurement.

All optical elements are aligned and rigidly fixed inside the PDA Receiving Optic. The PDA System comes with a PDA Controller and works with an adapted version of our proven LDV measuring software LDA-Control-Qt. This and the robust mechanical and optical design guarantee high system stability and a high measuring accuracy.

## Main Features

- Simultaneous measurement of velocity and particle size
- Photo-detectors integrated in receiving optic
- Simple setup and alignment
- High measuring accuracy
- High long term stability
- Manual positioning system for angle/laser beam alignment (optional)
- Automatic traversing (optional)
- Robust transport suitcases (optional)

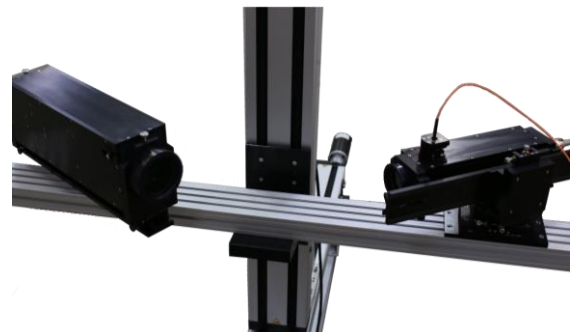


Fig. 2: Measuring setup of PDA Receiving Optic (left) and fp50 LDV Probe (right) on 3D Traversing System

# Specifications

## PDA Receiving Optic 1D

Dimensions	512 x 118 x 191 mm (L x W x H)
Weight	10.5 kg
Power supply	max.24 V DC (supply by PDA Controller)
Wavelengths	532 nm (*)
Focal Length	160, 310 mm (*)
Material of housing	Aluminum
Surface finish	Reflection-poor, black anodized (E6/EV6)
Particle size range	ca. 1 - 100 µm (**)
Accuracy	ca. 1 % concerning the particle diameter

(\*) other wavelengths/ focal lengths upon request

(\*\*) size range interchangeable with different aperture masks

## PDA Controller

Dimensions	330 x 370 x 150 mm (L x W x H)
Weight	4 kg
Input voltage	220-240 V AC
Frequency	50/60 Hz
Communication	Ethernet
Material of housing	Aluminum

## Manual positioning system for PDA measuring setup to use with fp50 LDV Probe

Dimensions	160 x 200 x 210 mm (L x W x H)
Weight	2.3 kg
Material	Aluminum
Surface finish	Reflection-poor, black anodized (E6/EV6)
Angle adjustment	combined coarse and high-resolution fine adjustment, horizontal and vertical



## Accessories

- Traversing System for automatic measurements with up to 4 axes and displacement from 200 mm up to 2 m
- Traversing software for different suppliers, integrated in LDV Software LDA-Control-Qt
- Manual positioning system for angle/laser beam alignment
- Workstation for PDA and LDV measurements
- Seeder and particles
- Robust transport suitcases