# *PYRITTE* Realtime growth control

## Simultaneous, in-situ measurement of film thickness and temperature

When optical components are manufactured, the film thickness of the individual layers (usually several hundred) must be carefully monitored. In addition, precise adherence to the specified wafer temperature must be checked.
The *Pyritte multi wafer II* system is designed especially for production of LEDs and laser diodes on optical, opaque substrates (GaAs, InP). This system is used for both MOVPE and MBE application areas.

*Pyritte multi wafer II* is a further development of the familiar *Pyritte* system extended for the requirements of modern multi-wafer production plants. Measured value acquisition can be performed on single wafers as well as wafer-individually for multi-wafer systems on rotating susceptors.

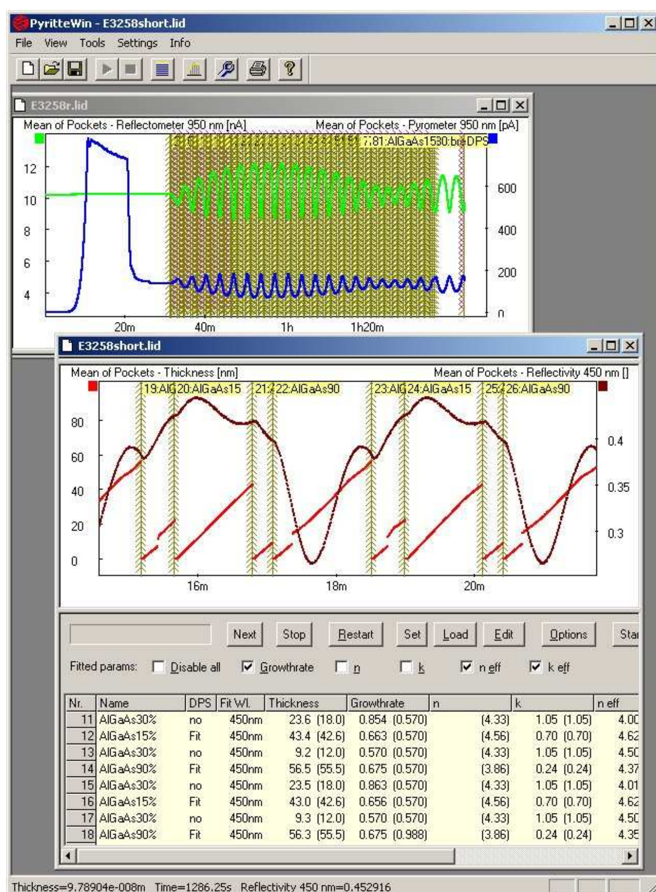


*Figure 1: **Pyritte**-screenshot of a typical Bragg reflector growth with interference oszillations in pyrometric und reflectivity data and corresponding thickness versus time graph*

*Figure 2: Pyritte remote optics attached to MOVPE-System*

## Growth monitoring in real time

From interference-caused fluctuations in wafer reflectivity during film growth, films thicker than 40 nm can be precisely determined to 1 nm. With its two reflectivity measuring angles with measuring wave lengths of 450 nm and 950 nm, *Pyritte* is suitable for thin and thick films.

Together with the controller of the system *Pyritte* monitors the growth of the individual films and permits real-time diagnosis of the deposition process. The patented principle of reflection-supported pyrometry used for temperature measurement offers much greater accuracy than conventional pyrometers. Interference-caused reflectivity variations of the wafer during the coating is also measured and included in temperature calculations.

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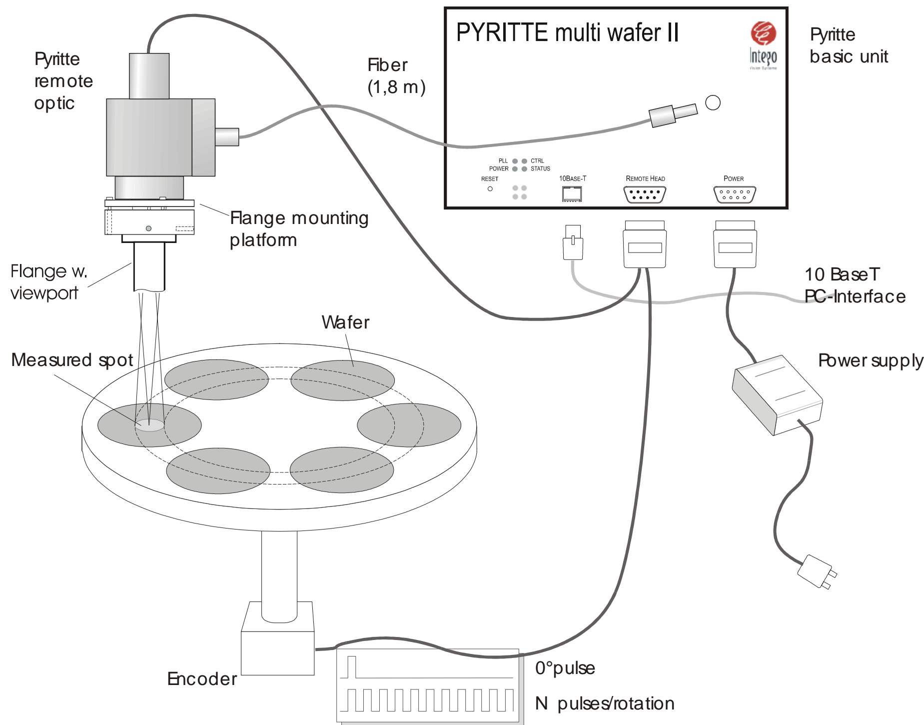


*Figure 3: Schematic overview*

## Scope of delivery

- Basic unit with remote optics
  Distance between optic head and basic unit: 1.8 meter
  Distance between basic unit and PC: up to 100 m
- PC with interface for communication with the system controller
- Standard mounting: Viewport adapter for 1.33" flange

If desired by the customer, the system can also be equipped with analog temperature output.
Additional adjustments on request.

## Prerequisites for use

- Substrate material: GaAs, SiGe, InP and other opaque materials in the working temperature range for the measuring wavelengths
- System types: MBE or MOVPE
- Viewport with at least 13 mm of free cross section vertical to sample Distance of Viewport to wafer: < 500 mm
- Angular encoder signals for multi-wafer systems
- Digital control signals for start and stop of layer

## Kontakt

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