



QSS
SENSORS AND COMPONENTS

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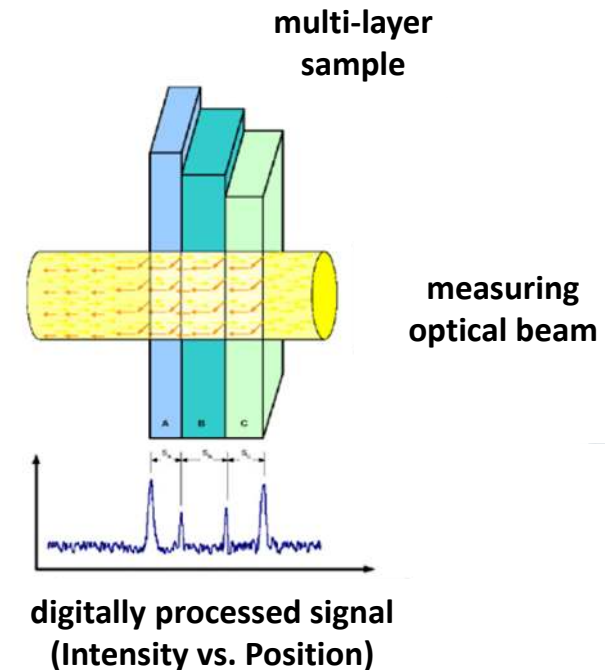


miro
OPTOELECTRONICS

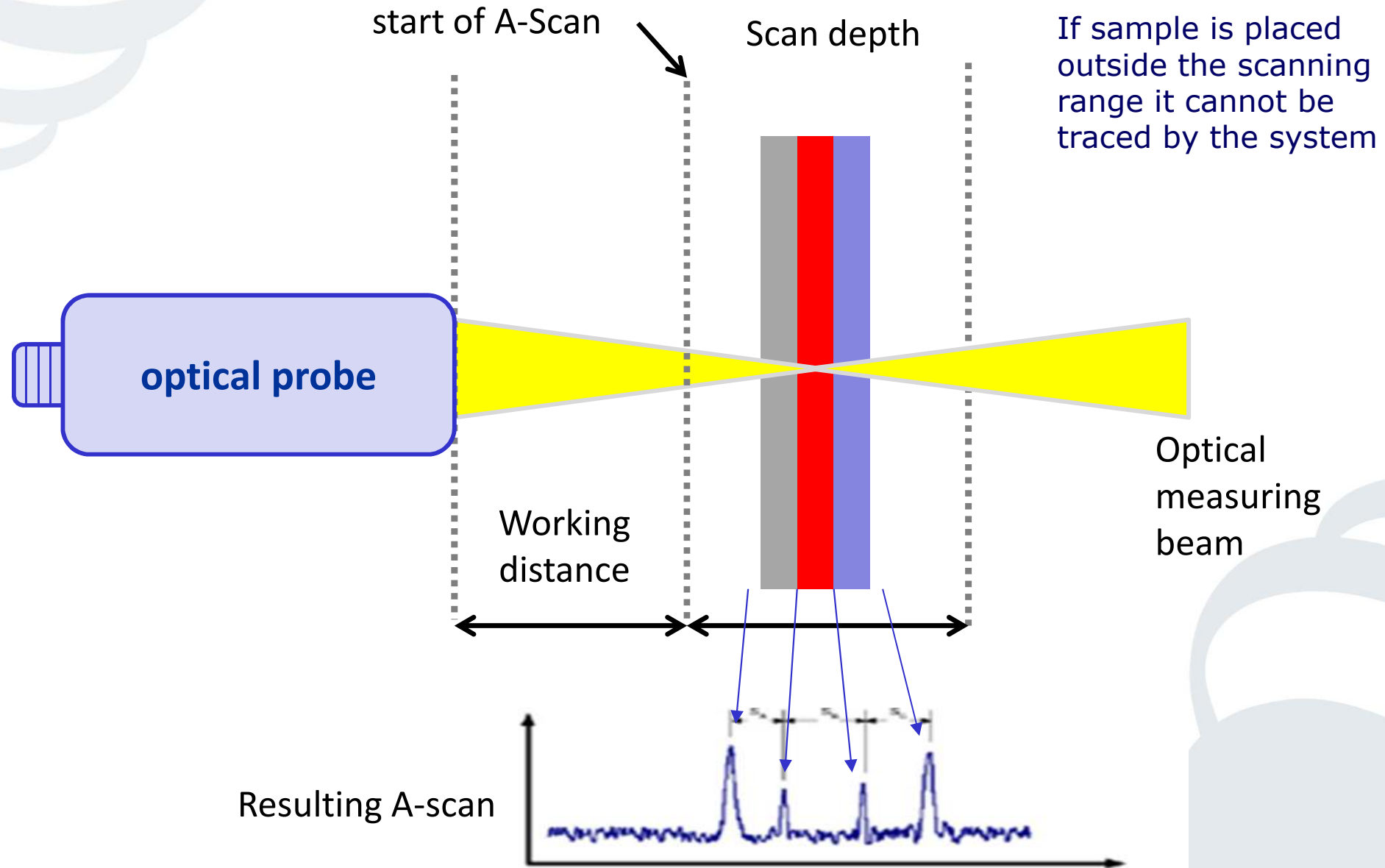
**Multi-layer thickness
optical measuring system**

How does it work ?

- It represents the **latest measuring solution** available on the market to optically measure thickness of sample with complex structure
- Layers of different material generate an optical reflection due to the **difference of the refractive index**
- Optical Head collect all the **reflections** that are **mixed together** with embedded optics
- The resulting signal will contain information about **position of each reflection**
- The processing of the optical signals allow the reconstruction of the **A-scan profile** (Intensity of reflection vs. Position)



scan depth



technical spec's

Specification	multi-Thick
	ML1
Measuring rate	120 Hz
Optical light source	NIR @ 850nm (P<1.5mW)
Scan depth (in air)	4 mm
Optical probe working distance	75/100 mm
Position Accuracy	< 1 micron
Minimum thickness of layer	>15/18 micron

applications

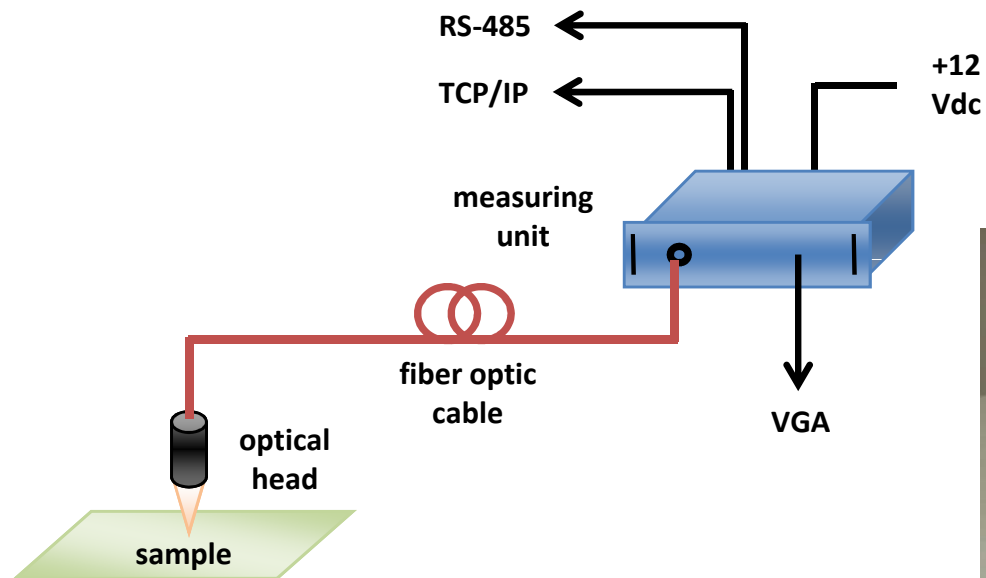
- **Materials measured:** any transparent or semi-transparent material (colours and/or particular surface finish need specific testing); coating on substrates
- **What is measured:** A-scan, i.e. intensity of optical interface vs. position (optical interface = difference in the refractive index). The analysis of the A-Scan allows extraction of information about layers
- **Target markets**
 - Plastic material extrusion
 - Glass production lines (flat, hollow)
 - Coating on glass or metal substrates
 - Medical plastic devices
 - Coating on optical devices

main advantages

- **one-sided** measure (reflection)
- high **accuracy**
- **non-contact**, non destructive measurement
- light used is **not dangerous**
- **easy to use**
- **quick integration** in laboratory and production lines

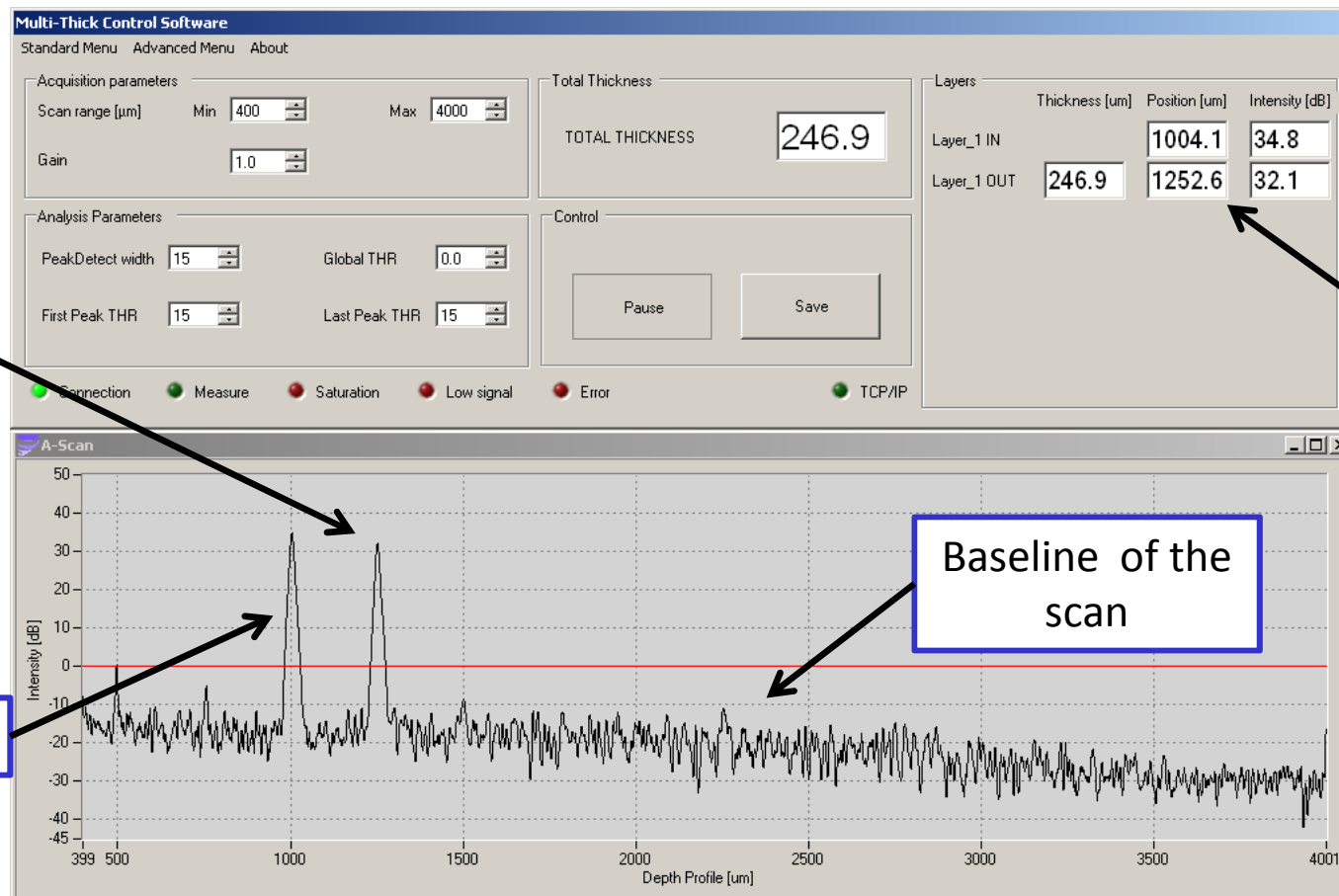
system layout

- ✓ Measuring system assembled in 19" rack 3Ux457mm with **fiber optic connection** to the optical head
- ✓ **Remote desktop**, VGA for direct connection; data output through **TCP/IP** and RS-485



embedded software

User-friendly interface with **A-scan** real-time display
digital data output management with supervisor system
 (TCP/IP, RS485)



Exit peak

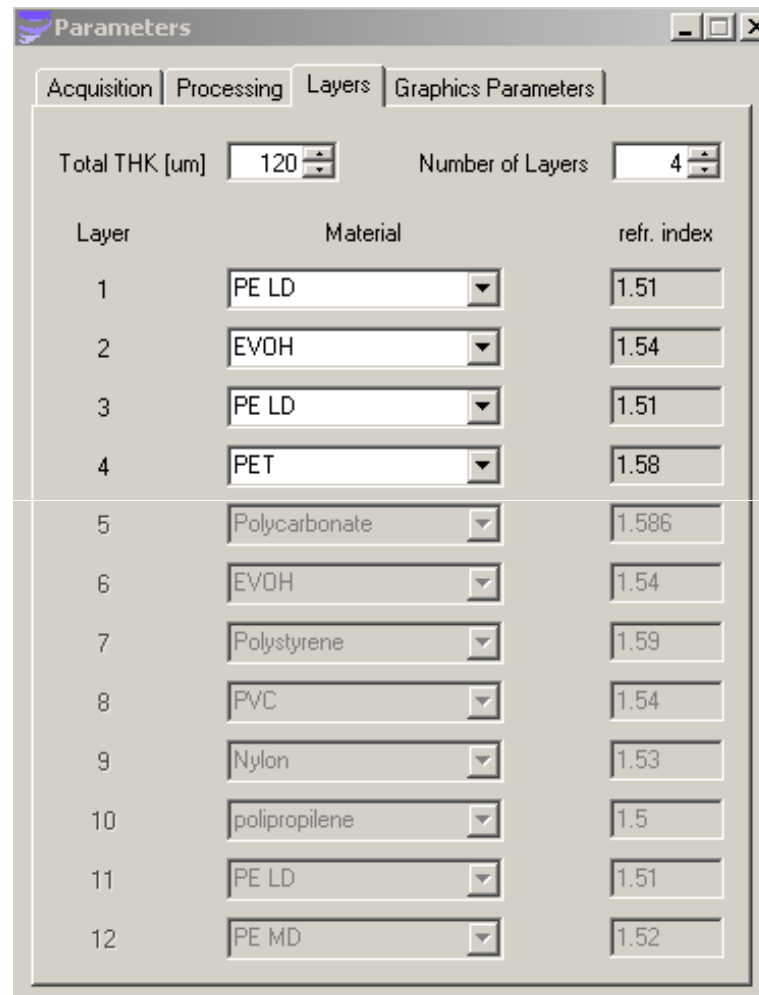
Position and intensity of major peaks

Baseline of the scan

Entrance peak

embedded software

Easy definition of nominal structure of the sample; a material can be setted for each layer



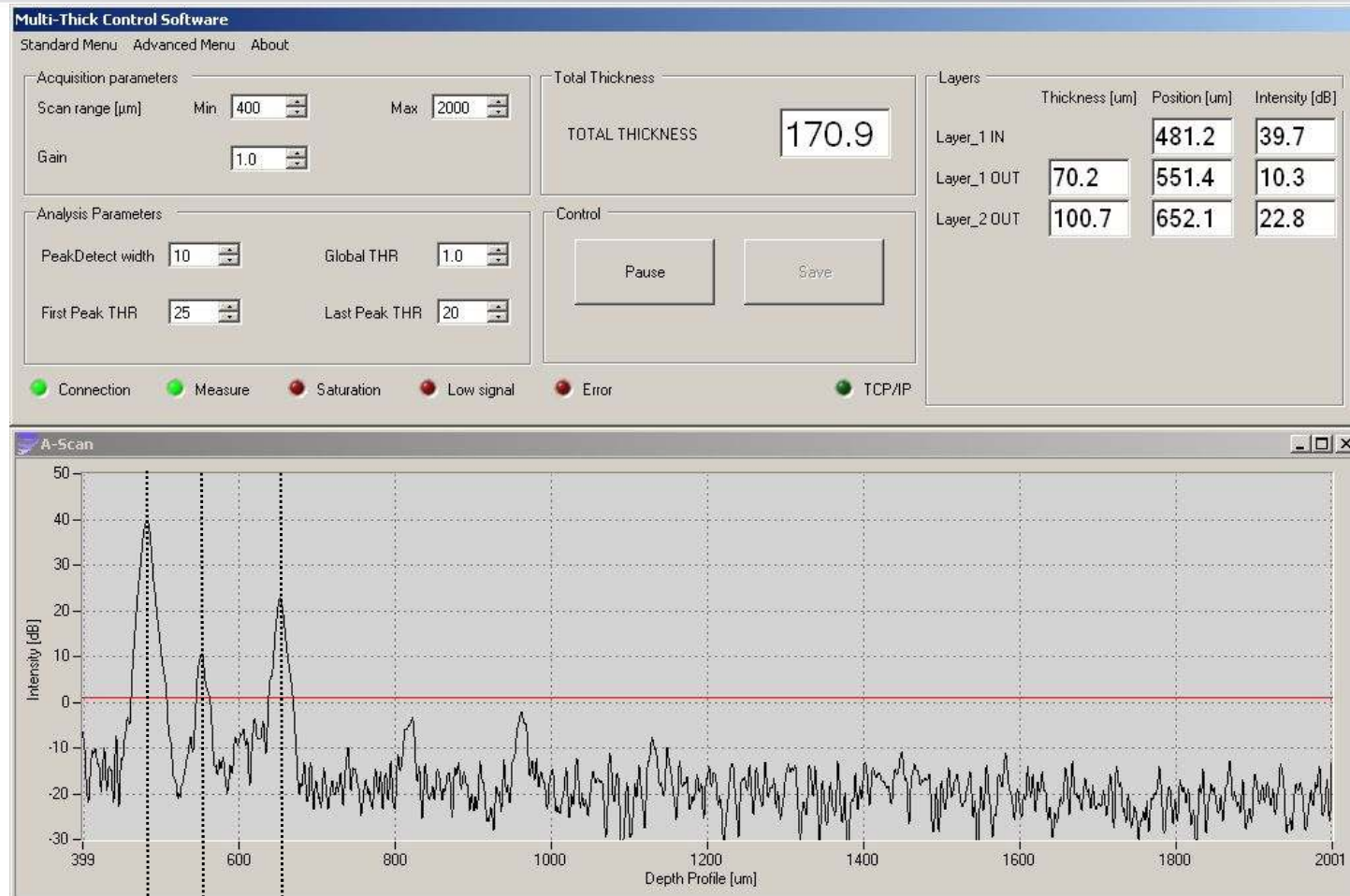
Parameters

Acquisition | Processing | Layers | Graphics Parameters

Total THK [um] Number of Layers

Layer	Material	refr. index
1	PE LD	1.51
2	EVOH	1.54
3	PE LD	1.51
4	PET	1.58
5	Polycarbonate	1.586
6	EVOH	1.54
7	Polystyrene	1.59
8	PVC	1.54
9	Nylon	1.53
10	polipropilene	1.5
11	PE LD	1.51
12	PE MD	1.52

A-Scan of a 2-layer sample



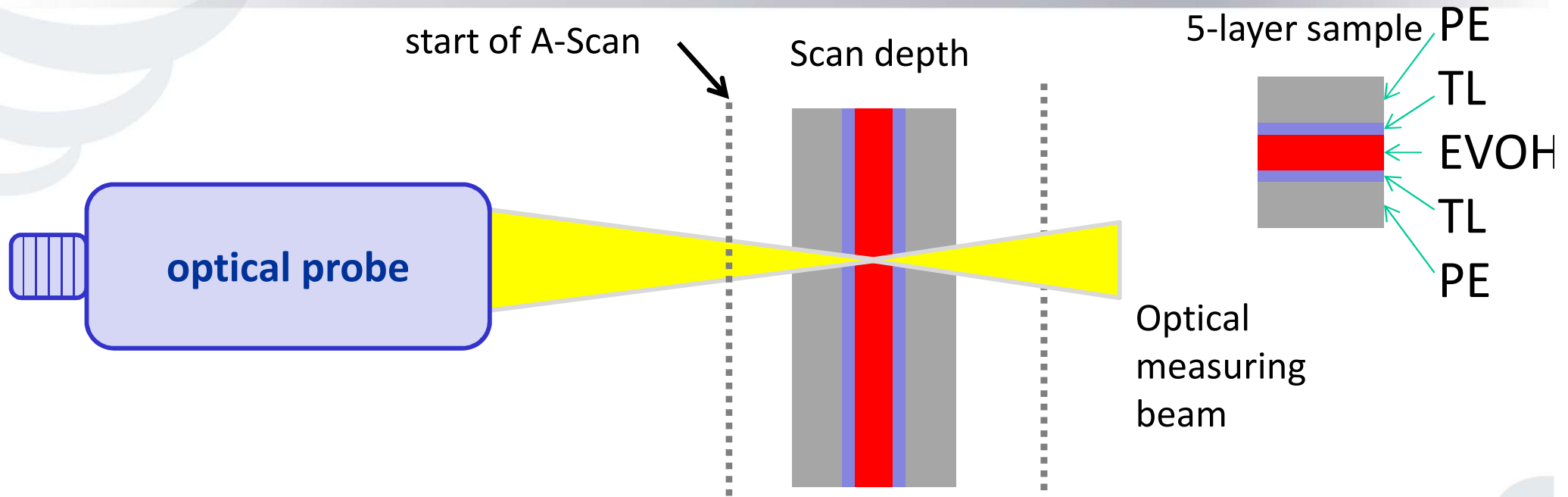
1° interface: sample entrance

2° interface : material change

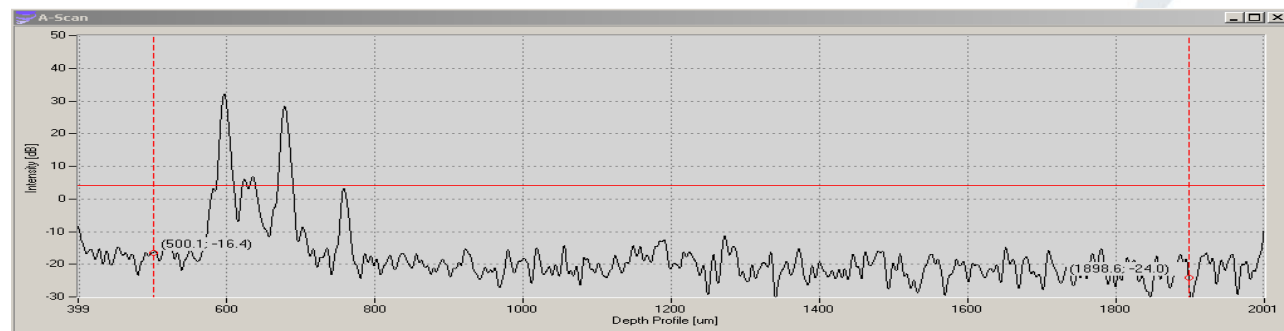
Interfaccia 3 : sample exit

The intensity of each reflection is related to the difference of the refractive index between layers

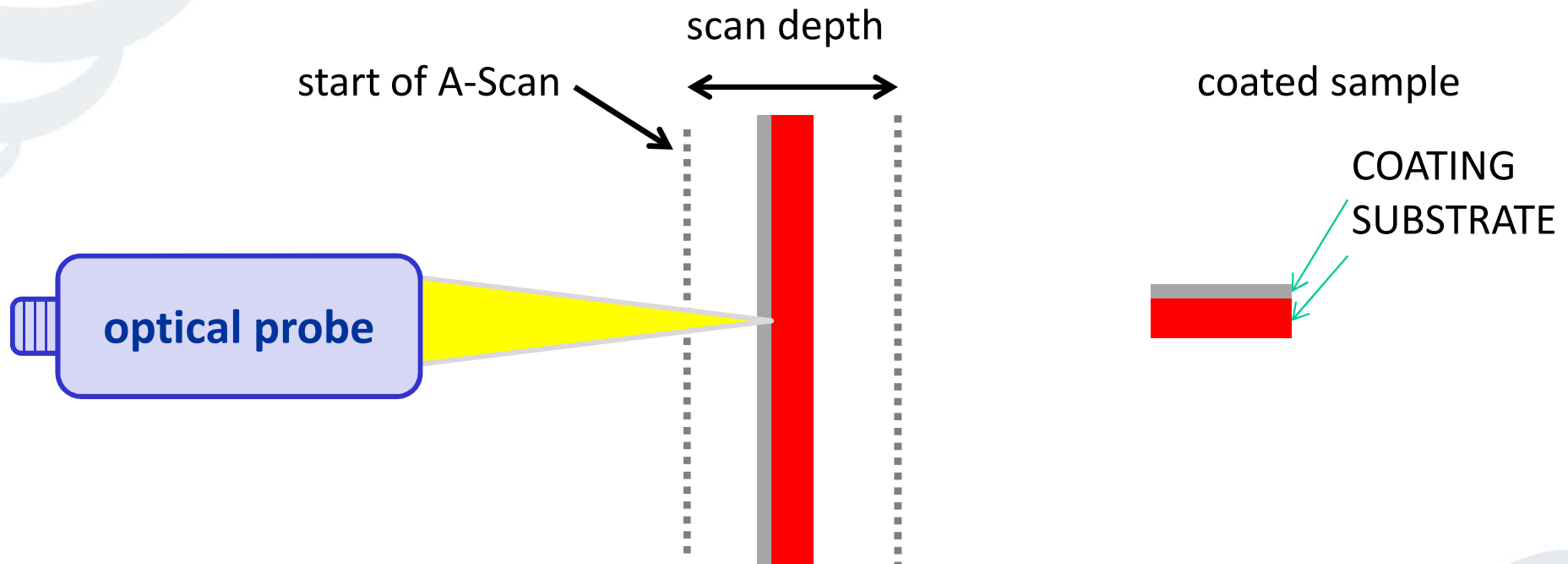
Barrier layer



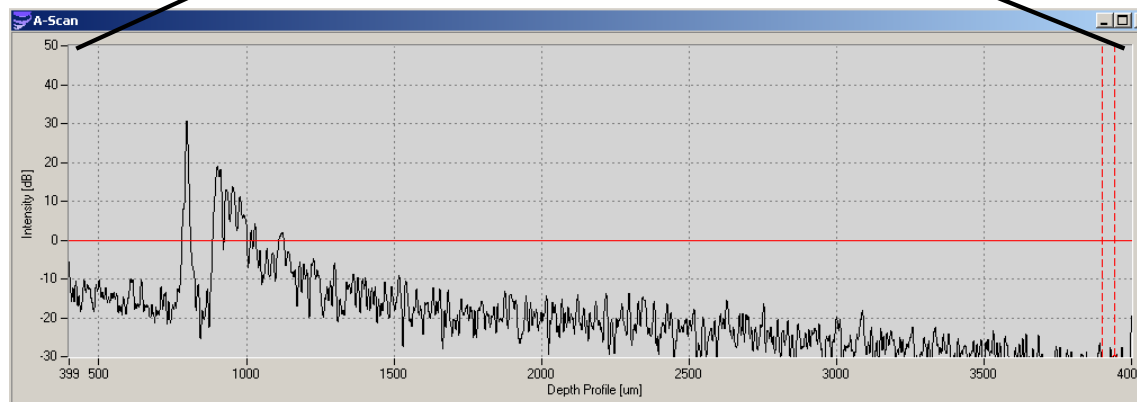
Resulting A-scan



Coating on diffusive substrate



Resulting A-scan:
The layer is easily measured





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