The ModBox-DER is the first equipment specially designed to measure the Dynamic Extinction Ratio (DER) of high contrast ns optical pulses in the 1000 nm wavelength band. It measures Extinction Ratios up to more than 50 dB, for pulses as short as 5 ns, from single-shot operation to 10 kHz repetition frequency.

The ModBox-DER uses the French Nuclear Agency technology developed for the monitoring of the MegaJoule laser. It finds applications mostly in ultra-intense laser facilities.

**Principle**

The high contrast pulse to be characterized is split in two parts: one part is strongly attenuated by a factor which is typically the expected value of the DER; for the second part, most of the pulse is retrieved using a high extinction modulator, leaving only the pedestal. The two parts are then measured with the same high bandwidth - high sensitivity photodetector for which only a few dB of dynamic range are required.

The main advantage of this measurement principle is the “self-calibration”. Peak and noise powers of the optical pulse are measured by the same high bandwidth and high sensitivity photodetector.

**Performances**

<table>
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<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
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<tr>
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<td>Signal type</td>
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<td>Pulse Width</td>
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<td>ns</td>
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<td>DER</td>
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<td>50</td>
<td>55</td>
<td>dB</td>
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<td>until 1 week</td>
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<td>Resolution</td>
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<td>ns</td>
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<td>-</td>
<td>2 m</td>
<td>s</td>
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<td>Pulse acquisition rate</td>
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**FEATURES**
- 1030 nm, 1053 nm, 1064 nm
- Dynamic Extinction Ratio up to 55 dB

**APPLICATIONS**
- Inertial confinement fusion
- Interaction of intense light with matter
- Laser Plasma interaction
- Laser implosion

**OPTIONS**
- Other maximum Extinction Ration value
- Wavelength

**RELATED EQUIPMENTS**
- ModBox-Pulse-Shaper
- Front-End System
ModBox-DER
Dynamic Extinction Ratio ModBox

Pulse and Pedastal Measurement

DER monitoring

Interfaces

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
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<th>Max</th>
<th>Unit</th>
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<tbody>
<tr>
<td>Connectivity</td>
<td>Standard USB 2.0 Mouse / Keyboard / USB Key</td>
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<tr>
<td></td>
<td>Ethernet port (remote control)</td>
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<tr>
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<td>Display</td>
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</table>

Ordering information

ModBox-DER-XXnm-YY-ZZ

DER = Dynamic Extinction Ratio
XXnm = 1030nm, 1053nm, 1064nm
YY = Optical Input Connector, FA : FC/APC - FC : FC/UPC - SC : SC/UPC
ZZ = Optical Diagnostic Connector, FA : FC/APC - FC : FC/UPC - SC : SC/UPC

About us

iXBlue Photonics includes iXBlue iXFiber brand that produces specialty optical fibers and Bragg gratings based fiber optics components and iXBlue Photline brand that provides optical modulation solutions based on the company lithium niobate (LiNbO₃) modulators and RF electronic modules.

iXBlue Photonics serves a wide range of industries: sensing and instruments, defense, telecommunications, space and fiber lasers as well as research laboratories all over the world.

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