

FEATURES

- Internal AWG
- Turn-key solution
- Low jitter
- Short rise and fall time
- Very high extinction ratio (35 dB / 55 dB)

APPLICATIONS

- Inertial confinement fusion
- Interaction of intense light with matter
- Laser plasma interaction
- Laser implosion
- Interaction of ion beam with HP laser

RELATED EQUIPMENTS

- ModBox Spectral Broadening

The Photline ModBox-FE is a complete front end laser system designed to be used as a seed source in high energy density laser facilities. The system is available at 1030 nm, 1053 nm and 1064 nm, it allows to generate 125 ps to 10 ns, custom shaped optical pulses with high stability and high extinction ratio. The short pulse generation is based on the combination of a high performance continuous laser source combined with a large bandwidth modulation stage based on a high extinction ratio external LiNbO₃ modulator. An automatic bias control circuitry (MBC) guarantees the extinction ratio stability over time and the optical pulses are carved out thanks to a high resolution Arbitrary Waveform Generator. A multi year collaboration experience with famous intense laser facilities all over the world allows Photline to propose high performance, reliable and easy to use systems perfectly suited to the various applications related with high energy optical pulse generation.

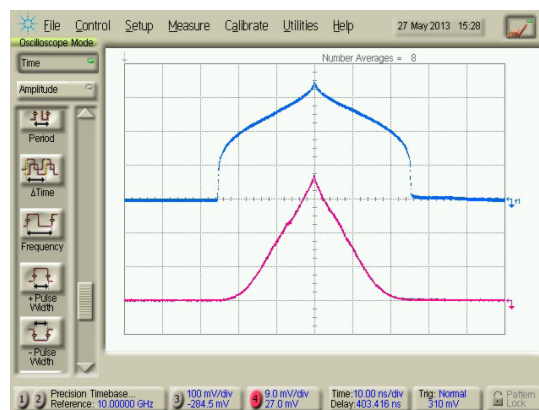
The ModBox-FE can be associated with the Spectral Broadening unit ModBox-SB in order to counter the SBS effects caused by the amplification of a narrow linewidth laser source.

Performance Highlights

	1030 nm	1053 nm	1064 nm
Pulse contrast	35 dB / 55 dB	35 dB / 55 dB	35 dB / 55 dB
Pulse waveform	arbitrary, user adjustable		
Pulse width	125 ps - 10 ns	125 ps - 10 ns	125 ps - 10 ns
Energy per pulse (1 ns- 35 dB ER- amplified laser source)	300 pJ	800 pJ	800 pJ
Energy per pulse (1 ns - 50 dB ER - amplified laser source)	100 pJ	250 pJ	250 pJ
jitter rms	10 ps	10 ps	10ps

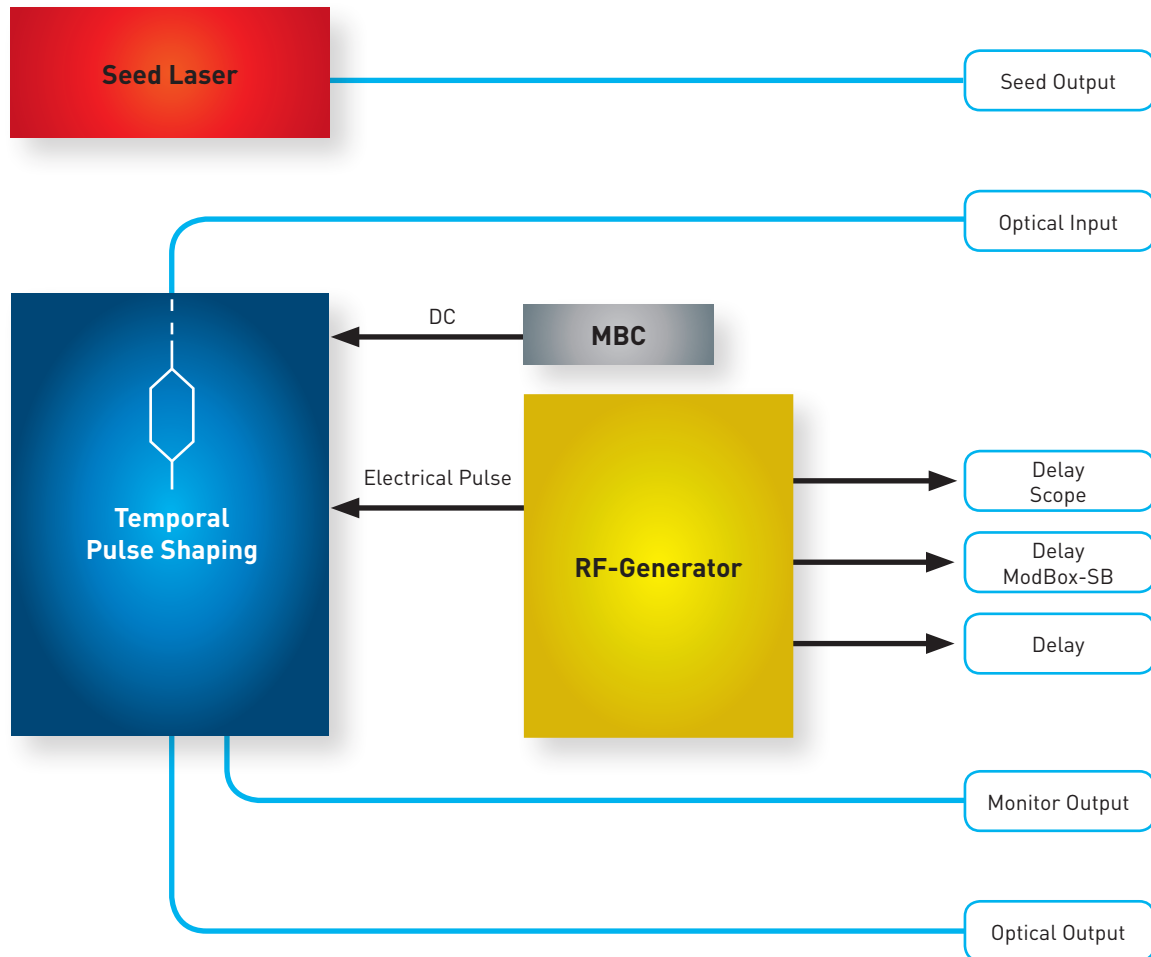
Specifications given at 25 °C, 1550 nm

Electrical & Optical Pulse Diagrams



Electrical pulse from AWG (blue curve) with corresponding Optical output (pink curve)

Functional Block Diagram



The ModBox Pulse Shaper integrates:

- a temporal pulse shaping block based on a modulator set to ensure a very high optical pulse extinction ratio (35 dB, or 55 dB) and flexible pulse shaping,
- an automatic Modulator Bias Control circuitry (MBC) to guarantee high extinction ratio stability over long periods of time,
- an RF-Generator with an arbitrary waveform capability
- a high performance, low noise CW laser source

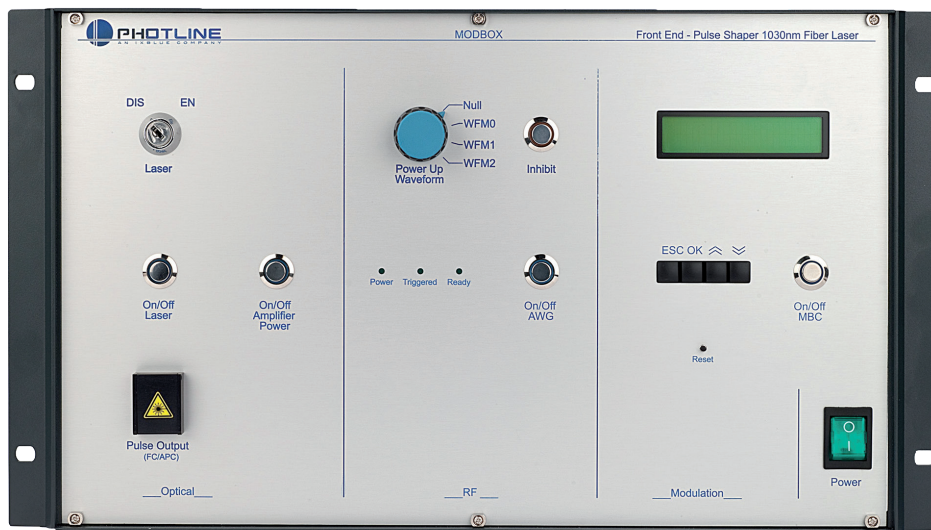
The ModBox offers several electrical outputs:

- "Delay scope": for scope synchronization,
- "Delay ModBox-SB": for pulse synchronization with the ModBox-Spectrum-Broadening,
- "Monitor output": an optical monitoring output.

ModBox

Panels

Parameter	Condition	Min	Typ	Max	Unit
Front panel					
Interface	AWG, Delay, MBC				LCD interface with keypad
Optical ports	Main & Monitor				FC/APC, SC/APC, bare fibers
Optical fiber	-				Polarization maintaining fiber, Corning PM 98-U25A



Parameter	Condition	Min	Typ	Max	Unit
Rear Panel					
Delay output connectors	-				SMA
Trigger input connector	-				BNC
AWG monitor output connector	-				SMA
Remote control connector	RF Generator (AWG & Delay) Seed laser MBC				USB

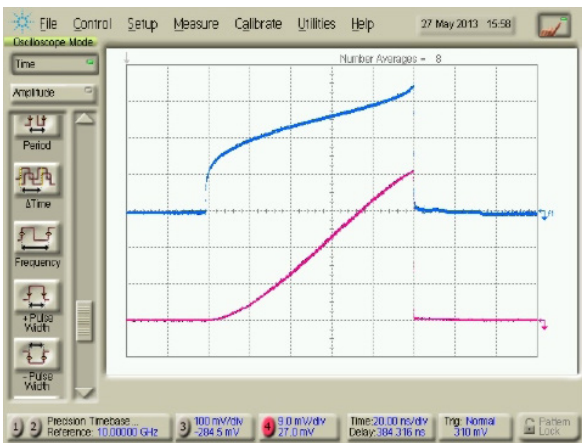
Dimensions - Compliance

Parameter	
Size	19 inches 6U
Weight	8 kg
Power supply	100 - 120 V / 220 - 240 V automatic switch, 50 - 60 Hz
Compliance	
Safety	EN 60625-1
Marking	CE

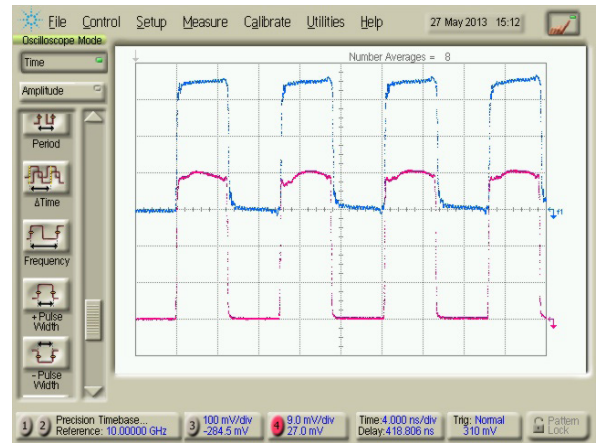
ModBox Electrical and Optical Outputs

The following equipment was used to obtain below results :

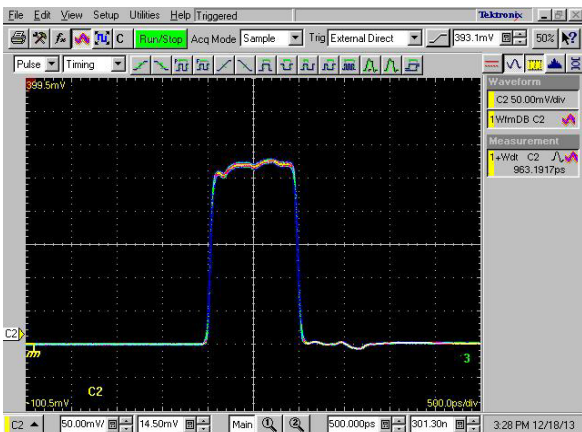
- ModBox-Front End with built-in AWG
- Oscilloscope Agilent 86100B
- Tektronix CSA 8000 oscilloscope



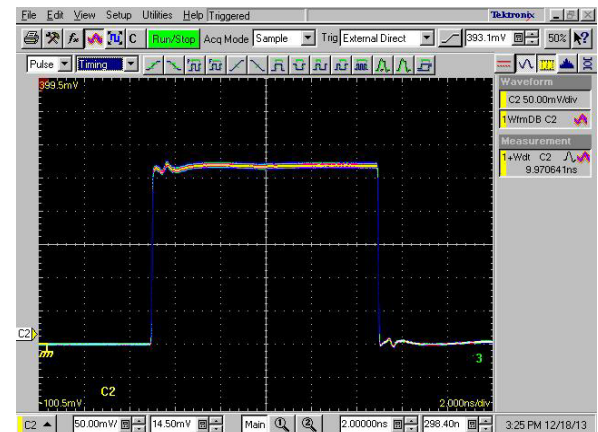
Electrical pulse from AWG (blue curve) with corresponding Optical output (pink curve)



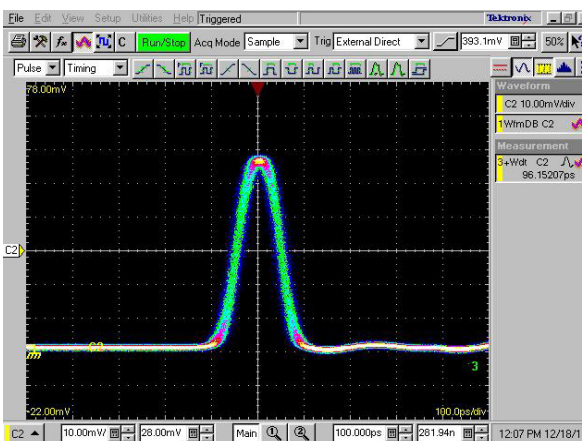
Electrical pulse from AWG (blue curve) with corresponding Optical output (pink curve)



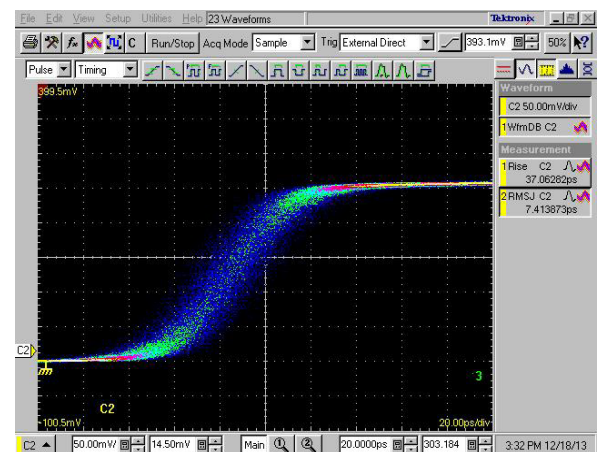
1 ns optical square pulse



10 ns optical square pulse

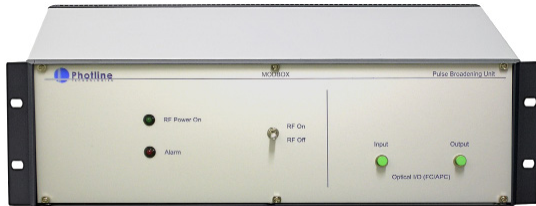


100 ps optical pulse



Jitter and rise time measurements, @ 10 ns and 10 kHz repetition rate

Related equipments



The ModBox-SB is spectral broadening solution to suppress the Stimulated Brillouin Scattering (SBS) caused in optical fibers by high fluxes of highly coherent light. The SBS degrades the signal integrity and prevents the proper transmission through the fiber. Under certain conditions, when amplification occurs for instance, the SBS can lead to the destruction of the fiber and the optical components along or forward the fiber.

The ModBox-SB is electrically triggered with the the ModBox-Pulse-Shaper.

Ordering information

ModBox-FE-WL-AWG-ER-AB-CD

WL = Wavelength : 1030nm, 1053 nm, 1064nm

AWG = AWG Option, omit if no electrical AWG

ER = Pulse Extinction Ratio : 35dB, 55dB

AB = Input connector : **00** bare fiber **FA** FC/APC, **SA** SC/APC

CD = Output connector : **00** bare fiber **FA** FC/APC, **SA** SC/APC

Note : optical connectors are Seikoh-Giken with narrow key or equivalent

Example : ModBox-SP-1053nm-AWG-55dB-FA-FA is a Pulse Shapping ModBox operating at 1053 nm which allows 55 dB pulse extinction ratio and equipped with FC-APC connectors.

About us

Photline is a member of the **ixBlue** group of companies and a provider of Fiber Optics Modulation Solutions based on the company LiNbO₃ modulators and high-speed electronics modules. Photline Technologies offers high speed and high data rate modulation solutions for the telecommunication industry and the defense, aerospace, instruments and sensors markets. The products offered by the company include : comprehensive range of intensity and phase modulators (800 nm, 1060 nm, 1300 nm, 1550 nm, 2000 nm), RF drivers and modules, transmitters and modulation units.

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